February 14, 2025
File No. 27220345.00

Mr. Jeff Biddick
Oklahoma Department of Environmental Quality
Division of Land Protection
707 N. Robinson
P.O. Box 1677
Oklahoma City, OK 73101-1677

Subject: **Tier III Permit Modification – Response to NOD**
American Environmental Landfill
ODEQ Permit No.: 3557021

Dear Mr. Biddick:

On behalf of our Client, American Environmental Landfill, Inc., SCS Engineers is submitting this response to the Notice of Deficiency dated November 14, 2024, from the Oklahoma Department of Environmental Quality (ODEQ) associated with the American Environmental Landfill Tier III Permit Application dated May 31, 2024. SCS Engineers has addressed the deficiencies noted in the Notice of Deficiency and those responses are shown below. Modified sections of the Tier III Permit Modification, which have been revised from the previous submittal, are included in Attachment A. The Tier III Permit Application is included in Attachment B.

1. ***Notice to Property and mineral rights owners.*** *The Application includes certified mail return receipts from adjacent property owners but did not address owners of mineral interests within the proposed expansion area in accordance with OAC 252:4-7-13(f)(3).*

Response: Appendix A has been revised to include mineral interest owner notification and certified mail receipt.

2. ***Legal right to property.*** *The Application narrative Section 3.3 states that property ownership documents are included in Appendix K. Appendix K includes temporary easement but does not include the property ownership documents required by OAC 252:515-3-34(a)(1) and (2).*

Response: Appendix K has been revised to include the Warranty Deed.

3. ***Alluvium and terrace deposits.*** *The Application includes a variance request for the location of the expanded permit boundary within areas designated as alluvium and terrace deposits. Appendix B (Subsurface Investigation), Section 2.3 includes the following statements regarding the subsurface investigation performed for the permit boundary expansion area:*

   "Borings performed for this investigation only identified a few areas where unconsolidated materials will be beneath the planned expansion excavation and the materials were identified primarily as silt clay or sandy clay. Materials composed of primarily silt or primarily sand, indicative of terrace deposits, were not identified below the planned expansion excavation. However, a few borings south of the planned\waste boundary encountered material comprised primarily of sand and/or silt indicative of terrace deposits."

Further, the Application narrative Section 3.7 states that the proposed excavation grades within the waste disposal boundary are primarily within the bedrock that underlies the site, and any unstable areas will be undercut to firm material and refilled with suitable compacted earthen fill.

In accordance with OAC 252:515-3-32(b), applicants requesting a variance must demonstrate that operations under the variance will equal or exceed the protection afforded by the particular rule for which the variance is being requested and will not result in a hazard to human health or the environment.

Please provide the following items to support the variance request:

a. *An excavation plan that depicts anticipated excavation depths along with areas where unconsolidated materials and terrace deposits (including silty clay and sandy clays) were identified beneath the proposed disposal cells and leachate pond.*

Response: Drawings have been developed and are included to address an over-excavation plan that shows the anticipated excavation depths, areas of unconsolidated materials, and terrace deposits.

b. *An updated Quality Assurance / Quality Control Plan to include detailed information on how to identify and undercut unstable areas during construction of the disposal cells and leachate pond.*

Response: Section 3.2.1 of the QA/QC Plan states that "*Prior to beginning liner construction, the liner subgrade area will be proof-rolled with heavy, rubber-tired construction equipment to detect unstable areas. Unstable areas will be undercut to firm material and refilled with suitable compacted earth fill. If the subgrade is achieved through excavation, the upper 6 inches of the subgrade will be compacted to a minimum of 90 percent of the maximum dry density as determined by the Standard Proctor (ASTM D 698), unless the subgrade is part of the perimeter berm. Perimeter berm soils shall be compacted to 95 percent of the maximum dry density at a moisture content varying from one percentage point below optimum to three percentage points above optimum*." Unstable areas will be identified by the proof rolling activities. The subgrade density will be confirmed through compaction testing. Any areas that fail either the proof rolling or compaction testing will be removed and replaced with suitable material and compacted in accordance with the QA/QC Plan.

c. *A description of how the proposed design provides equivalent or greater protection than that afforded by OAC 252:515-5-51(a).*

Response: Section 3.7 of the permit narrative has been revised to state: By removing unsuitable material and compacting the subgrade in accordance with the QAQC Plan, this design will meet the protection afforded by OAC 252:515-5-51(a).

4. ***Groundwater elevations:*** *Appendix B (Subsurface Investigation), Figure 3.4 shows some boreholes as having stabilized water levels at or above the proposed landfill excavation contour.*

It appears that the borehole water elevations were not considered when constructing the highest groundwater contour. Please note that OAC 252:515-3-74 requires the highest groundwater contour to incorporate the highest recorded groundwater elevation at each borehole, piezometer, or monitoring well across the site. Please provide revised landfill contours ensuring a 5-foot separation from the highest recorded groundwater elevation at each borehole, piezometer, or monitoring well across the site. Alternatively, AEL may propose procedures for completing an additional groundwater study prior to construction of the proposed disposal cells to verify compliance with OAC 252:515-11-3 (Separation from groundwater).

Response: *Initial and 24-hour stabilized groundwater measurements were not considered when designing the base grades for the expansion due to the discontinuity of the water-bearing zones. Eleven of twenty-three borings (B-13, B-16, B-18, B-21, B-24, B-25, B-28, B-29, B-32, B-33, and B-38) had observed groundwater elevations above the planned landfill contours. The groundwater elevation difference in these borings ranges between 2' and 58' when compared to the planned landfill contours. Similar to the existing Phase IV, located immediately east of the expansion area, which contained localized discontinuous pockets of groundwater, the planned expansion area is expected to contain similar localized pockets of discontinuous water-bearing zones. As such, these localized pockets will be excavated and removed prior to cell construction. Visual inspections during the construction of Phase IV have not indicated the presence of groundwater seeps or a saturated zone along the cell boundaries. By removing the discontinuous water-bearing zones, the 5-foot vertical separation between waste placement and the groundwater will be achieved.* To verify compliance with *OAC 252:515-11-3, AEL proposes to perform "pothole" excavations at each of the 11 borehole locations mentioned above to a depth of 3' below the subgrade elevation. Pot-hole excavation activities will occur at borehole locations located within a given cell construction area, prior to issuing construction drawings. Potholes will be left open for a period of less than 6 hours and observed for the presence of groundwater. After the presence of groundwater is confirmed, the construction drawings for the given construction area will be made final.*

5. ***Statistical Analysis Plan.*** *Please update Appendix D (Groundwater Monitoring Plan) to include more information on statistical procedures for determining statistically significant increases, updating background datasets, and conducting verification resampling (if applicable).*

Response: Section 6 of Appendix D has been revised to include more information on statistical *procedures for determining statistically significant increases, updating background datasets, and conducting verification resampling.*

6. ***Gas monitoring probes.*** *Appendix E (Explosive Gas Monitoring Plan), Section 4.1 states that 21 new gas probes will be installed around the expanded permit boundary to a depth equivalent to the deepest placement of waste (708 feet msl). In Appendix E, Table 3, the bottom screen elevations for the proposed gas probes range from 705 to 792 feet msl; the depths appear to be based on waste elevations near each gas probe rather than the overall deepest placement of waste in the expansion area. Please provide justification for the disparity in gas probe depths which do not meet the overall deepest depth of waste in the expansion area.*

Response: Gas probe depths are based on the adjacent waste placement elevations to protect the groundwater from contamination. Furthermore, gas migration will be confined by the groundwater elevation and surrounding bedrock.

7. ***Leachate collection and management.***
    a. *The Application narrative Section 11.5 proposes that leachate generated in the expansion area will be transferred via force main into a new leachate pond. Please show the proposed leachate force main on a map.*

Response: Drawings have been developed and are included to show the proposed leachate forcemain.

    b. *The Application narrative Section 11.5 states that leachate stored in the leachate storage impoundments will be recirculated in accordance with their approved plan. Please provide an updated leachate recirculation plan in accordance with OAC 252:515-13-53*

Response: An updated leachate recirculation plan has been included in Appendix M.

    c. *In accordance with OAC 252:515-13-32(3)(E), cleanouts should be spaced less than 1,200 feet apart along leachate collection pipes to ensure that all collection pipes can be accessed and cleaned out. Greater distances may be allowed if equipment is available that will accommodate the larger spacing. Please describe the equipment that will be used to access and clean out the proposed collection piping network to satisfy the requirements of OAC 252:51 5- 13-32(3)(E).*

Response: Progressive Environmental Services (PES) provides leachate cleanout services for Republic Services, Waste Management, and Waste Connection landfills across the nation. PES uses a proprietary cleaning solution to provide cleanout services for leachate collection piping with no theoretical limit of cleanout distance. However, PES has requested a cleanout be installed on the low side (as originally proposed) and on the high side of the Leachate Collection System to ensure the entirety of the pipe can be cleaned out. Drawings have been developed and are included to show the added cleanout locations.

8. ***Salvage and Recycling.***

    a. *Appendix I (Operations Plan), includes a Salvage and Recycling Plan as Appendix D. Section 2.1 of the Salvage and Recycling Plan states, "Uncontaminated rock, dirt, concrete, bricks, and solidified asphalt found suitable for beneficial reuse by the facility may be used as daily and intermediate cover, erosion and run-on/off controls, site improvements, etc." Please note, that the use of alternative daily and intermediate cover requires demonstrations and DEQ approval in accordance with OAC 252:515- 19-51(d) and 19-52(d). The Application did not include any demonstrations for alternative daily/intermediate cover materials.*

Response: Section 2.1 of the Salvage and Recycling Plan, included in Appendix I, has been revised to include the required demonstrations for the alternative daily/intermediate cover materials.

    b. *The Salvage and Recycling Plan indicates that some materials will be recycled or transported offsite on an as-needed basis depending on market feasibility. Under the*

beneficial reuse requirements in OAC 252:515-1-7(c), if waste is accumulated in anticipation of future markets or is stored in a quantity exceeding that which may be reasonably expected to be used or recycled within one (1) year, the material is regulated as solid waste. It is DEQ's policy to extend this accumulation limit to salvage and recycling operations at solid waste disposal facilities. Please update the Salvage and Recycling Plan to include an accumulation limit consistent with OAC 252:515-1- 7(c).

Response: Section 2.1 of the Salvage and Recycling Plan, included in Appendix I, has been revised to limit the storage of recyclable material to 1 year or less.

9. ***Waste Exclusion Plan:*** *DEQ previously reviewed the Waste Exclusion Plan (WEP) included in Appendix J of the Application and required revisions which are discussed in Consent Order Case No. 24-197, executed August 26, 2024, and a Notice of Deficiency dated September 3, 2024. DEQ received the revised WEP on October 14, 2024. Please include the revised WEP in the Application.*

Response: The revised WEP, dated October 14, 2024, has been included as Appendix J.

10. ***Disposal acreage.*** *Please provide the estimated acreage for each disposal cell in the expansion area.*

Response: Drawings have been developed and are included to show the estimated acreage for each disposal cell in the expansion area. Cell 7 area includes the constructed portions of Phase IV that will convey leachate to the Cell 7 sump.

This response has been prepared to address the Notice of Deficiency dated November 14, 2024, in reference to the Tier III Permit Modification dated May 31, 2024. We trust that the attached documents include all the information sufficient for your approval. Should you have any questions or comments or need additional information, please do not hesitate to contact the undersigned at (405) 265-3960. Thank you very much for your time and effort in this matter.

Sincerely,

Trevar Lytle, P.E.
Senior Project Professional
SCS Engineers

Floyd Cotter, P.E.
Vice President
SCS Engineers

cc: Mr. Todd Green – American Environmental Landfill, Inc.

Attachment A

Pages from Revised Sections and Appendices

Supplemental Drawings

Notice to Property and Mineral Right Owners

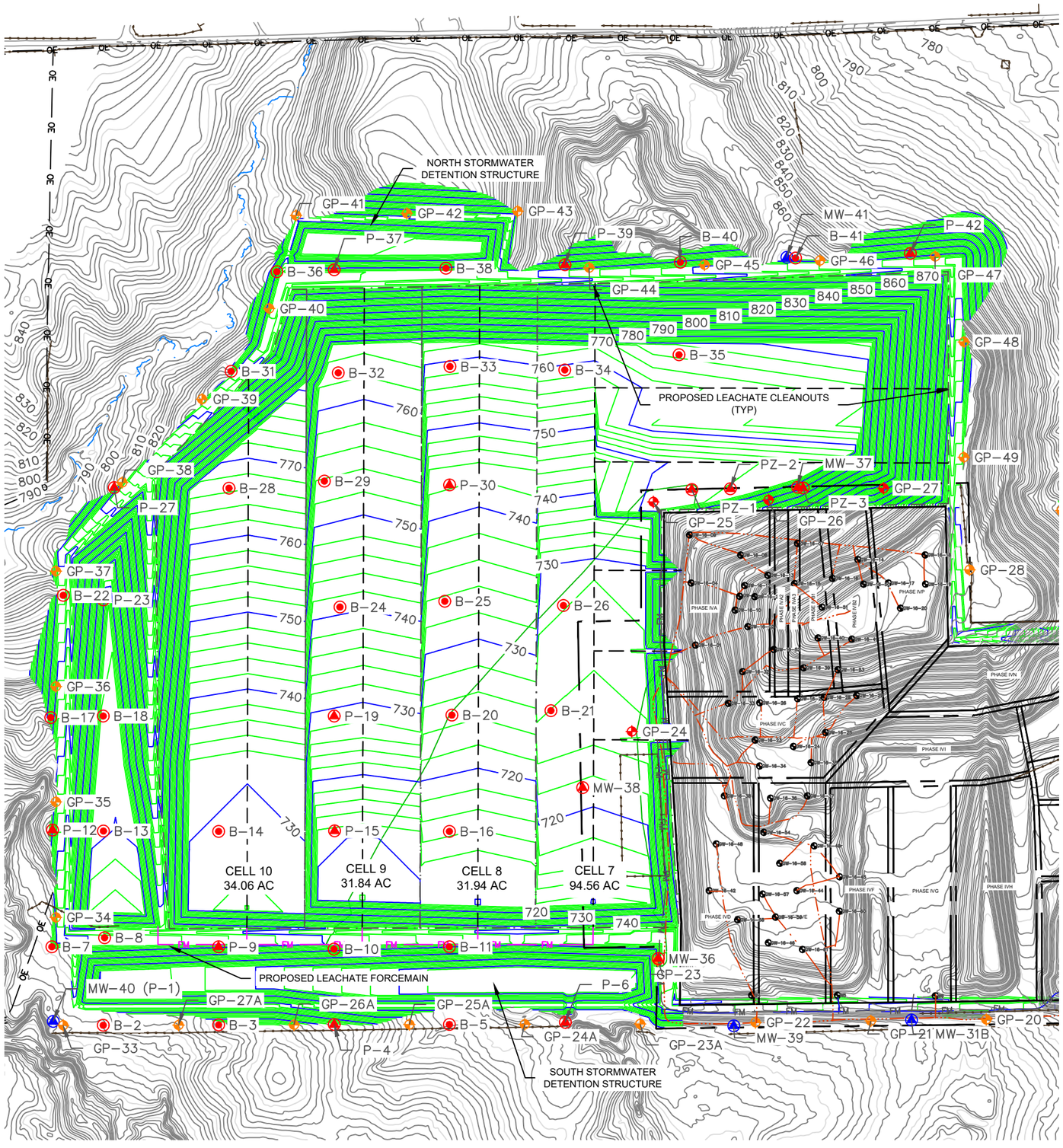
Warranty Deed

Section 3.7 of the Permit Narrative

Section 6 of Groundwater Monitoring Plan

Section 2 of the Salvage and Recycling Plan

Supplemental Drawings



LEGEND:

- EXISTING 2' MINOR CONTOUR
- EXISTING 10' MAJOR CONTOUR
- EXISTING FENCE
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNPAVED ROAD
- EXISTING PAVED ROAD
- EXISTING STREAM/WATER BODY
- SOLID WASTE PHASE BOUNDARY
- SOLID WASTE PERMIT BOUNDARY
- ELECTRICAL CONDUIT
- LEACHATE FORCEMAIN
- LANDFILL GAS COLLECTION SYSTEM PIPING
- EXTRACTION WELL
- GAS PROBE
- MONITORING WELL
- MONITORING WELL ABANDONMENT
- GAS PROBE ABANDONMENT
- PROPOSED EXPANSION AREA PERMIT BOUNDARY
- PROPOSED LIMITS OF WASTE
- PROPOSED CELL BOUNDARY
- PROPOSED LEACHATE COLLECTION TRENCH
- PROPOSED MINOR CONTOURS
- PROPOSED MAJOR CONTOURS
- PROPOSED LEACHATE FORCEMAIN
- BORE HOLE LOCATION

NOTES:

1. AERIAL TOPOGRAPHY PERFORMED BY AERIAL DATA SERVICES, LLC ON JANUARY 27, 2023.
2. PROPOSED GAS PROBES AND MONITORING WELLS ARE DEPICTED WITHIN THE EXPANSION AREA.
3. CELL 7 ACREAGE INCLUDES THE EXISTING PHASE IV AREA THAT WILL DRAIN LEACHATE TO CELL 7.

REGISTERED PROFESSIONAL ENGINEER
FLOYD E. COTTER
17783
OKLAHOMA
2/12/25

500 0 500 1000
SCALE FEET

REV.	DATE	DESCRIPTION	OK. BY

SHEET TITLE: SITE LAYOUT

PROJECT TITLE: AEL LATERAL EXPANSION PERMITTING RESPONSE TO NOD

CLIENT: AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OK

SCS ENGINEERS
8575 West 110th Street, Suite 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

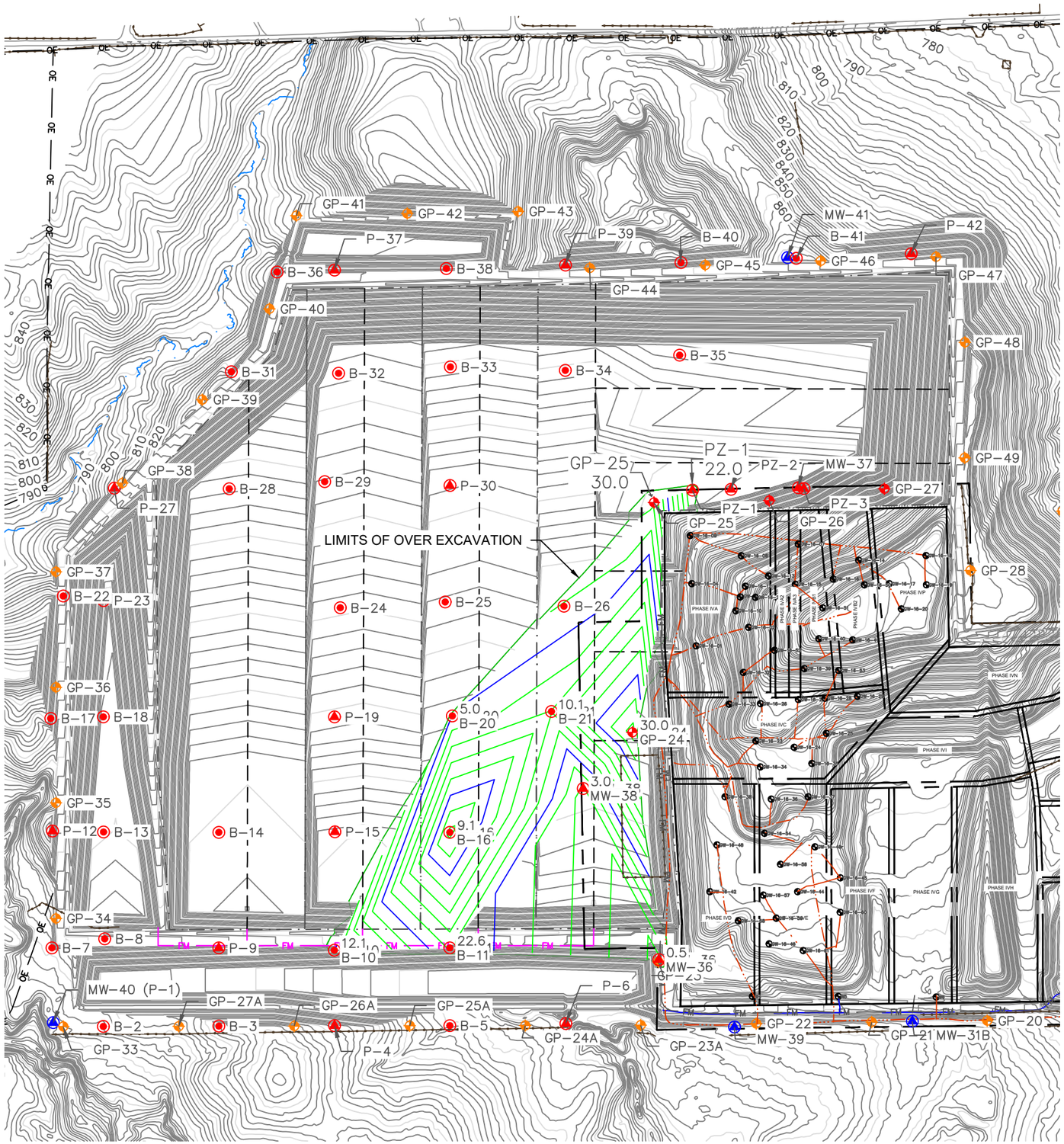
PROJ. NO. 27220345.00 | DSN. BY: TWL | CHK. BY: CF | O/A RVW BY: W.M | PROJ. MGR: W.M

CADD FILE: RESPONSE TO NOD.DWG

DATE: 1/20/25

SCALE: 1"=500'

DRAWING NO. 1 of 2



LEGEND:

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- PROPOSED MINOR CONTOURS
- PROPOSED MAJOR CONTOURS
- PROPOSED LEACHATE FORCEMAIN
- BORE HOLE LOCATION

NOTES:

1. AERIAL TOPOGRAPHY PERFORMED BY AERIAL DATA SERVICES, LLC ON JANUARY 27, 2023.
2. PROPOSED GAS PROBES AND MONITORING WELLS ARE DEPICTED WITHIN THE EXPANSION AREA.
3. PROPOSED SUBGRADE CONTOURS ARE SHOWN AS EXISTING.
4. PROPOSED OVER EXCAVATION DEPTHS, AS MEASURED BENEATH THE SUBGRADE ELEVATION, ARE SHOWN FOR EACH BORING THAT IS EXPECTED TO CONTAIN ALLUVIUM OR TERRACE DEPOSITS.

REGISTERED PROFESSIONAL ENGINEER
FLOYD E. COTTER
17783
OKLAHOMA
2/12/25

N

500 0 500 1000
SCALE FEET

REV.	DATE	DESCRIPTION	CK. BY

SHEET TITLE: OVER EXCAVATION PLAN

PROJECT TITLE: AEL LATERAL EXPANSION PERMITTING RESPONSE TO NOD

CLIENT: AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OK

SCS ENGINEERS
8575 West 110th Street, Suite 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX: (913) 681-0012

PROJ. NO. 27220345.00
DSN. BY: TWL
DWN. BY: TWL
CHK. BY: CF
Q/A RVW BY: WJM
PROJ. MGR: WJM

CADD FILE: RESPONSE TO HOLDING

DATE: 1/20/25

SCALE: 1"=500'

DRAWING NO. 2 of 2

Notice to Property and Mineral Right Owners

Adjacent Property Owner Notification

May 14, 2024
File No. 27220345.00

See addresses attached.

Subject: **American Environmental Landfill**
Proposed Landfill Expansion Notification
ODEQ Permit No.: 3557021

As required by the Oklahoma Department of Environmental Quality, SCS Engineers is submitting this notification associated with the proposed expansion of the American Environmental Landfill, which is owned and operated by American Environmental Landfill, Inc. As an adjacent property owner, Oklahoma law requires you to be notified of the application filing. The proposed landfill expansion consists of approximately 203 acres and is located on North 177th Ave, 5.5 miles West of Sand Springs. The expansion is more accurately described as the North ½ of Section 35 and West ½ of Section 36, Township 20 North, Range 10 East, in Osage County, Oklahoma.

If you have any questions or comments, please do not hesitate to contact the undersigned at (405) 246-1574. Thank you for your time and effort in this matter.

Sincerely,

Trevar Lytle, P.E.
Senior Project Professional
SCS Engineers

Wade J. Miller
Project Director
SCS Engineers

cc: Mr. Todd Green – American Environmental Landfill

Certified Mail Receipients

Adjacent Property Owners to Americal Envionmental Landfill					
Map ID	**Name**	**Street Address**	**City**	**State**	**Zip**
1	David and Nadine Hardy	1285 W Anderson Rd	Sand Springs	OK	74063
2	David Hunter and Frances Hawkins	52 N 194th W Ave	Sand Springs	OK	74063
3	James and Christine King	1317 Anderson Rd	Sand Springs	OK	74063
4	Jason and Karen Kearns	42 N Sunset Ave	Sand Springs	OK	74063
5	Jerry and Peggy Easter	PO Box 384	Sand Springs	OK	74603
6	John and Laura Bright	43 N Sunset Ave	Sand Springs	OK	74063
7	Karen Wilder	1157 Andreson Rd	Sand Springs	OK	74063
8	LPU Group Investments	8215 S Mingo Rd, #150	Tulsa	OK	74133
9	Lynn Ingram and Nancy Delwater	1100 N 197th W Place	Sand Springs	OK	74063
10	Michael and Teina Burns	818 Anderson Rd	Sand Springs	OK	74063
11	Michael Lobsinger and Brandee Harris	2301 N 193rd W Ave	Sand Springs	OK	74063
12	Paul and Holly Shreffler	86 N Sunset Ave	Sand Springs	OK	74063
13	Robert and Virginia Humphrey	1625 Anderson Rd	Sand Springs	OK	74063
14	Salvador and Belen Ruiz	19 Eagle Drive	Sand Springs	OK	74063
15	Sand Springs Home	PO Box 278	Sand Springs	OK	74063
16	Stanley and Barbara Gomez	201 W First St	Sand Springs	OK	74063
17	Stephen and Chaleah Lane	29 N 194th W Ave	Sand Springs	OK	74063
18	Forrest Burns Trust	466 N 177 W Ave	Sand Springs	OK	74063
19	Shell Creek Game Farms, LLC.	466 N 177 W Ave	Sand Springs	OK	74063

Mineral Right Owner Notification

December 12, 2024
File No. 27220345.00

Osage Nation
P.O. Box 807
Pawhuska, OK 74056

Subject: **American Environmental Landfill**
Proposed Landfill Expansion Notification
ODEQ Permit No.: 3557021

As required by the Oklahoma Department of Environmental Quality, SCS Engineers is submitting this notification associated with the proposed expansion of the American Environmental Landfill, which is owned and operated by American Environmental Landfill, Inc. As the Mineral Interest Owner, Oklahoma law requires you to be notified of the application filing. The proposed landfill expansion consists of approximately 203 acres and is located on North 177th Ave, 5.5 miles West of Sand Springs. The expansion is more accurately described as the North ½ of Section 35 and West ½ of Section 36, Township 20 North, Range 10 East, in Osage County, Oklahoma.

If you have any questions or comments, please do not hesitate to contact the undersigned at (405) 246-1574. Thank you for your time and effort in this matter.

Sincerely,

Trevar Lytle, P.E.
Senior Project Professional
SCS Engineers

Wade J. Miller
Project Director
SCS Engineers

cc: Mr. Todd Green – American Environmental Landfill

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52 North 194th W. Ave.
Sand Springs, OK 74063

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Sand Springs, OK 74063

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David and Nadine Hardy
1285 W Anderson Rd.
Sand Springs, OK 74063

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Sand Springs, OK 74063

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Lynn Ingram and Nancy Delwater
1100 N 197th W. Place
Sand Springs, OK 740663

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Karen Wilder
1156 Anderson Rd
Sand Springs, OK 74063

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John and Laura Bright
43 N Sunset Ave
Sand Springs, OK 74063

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Michael and Teina Burns
818 Anderson Rd
Sand Springs, OK 74063

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USPS

7022 0410 0002 7224 4182

Michael Lobsinger and Brandee Harris
2301 N 193rd W. Ave
Sand Springs, OK 74063

for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Sand Springs, OK 74063

Certified Mail Fee	$4.40
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

Postmark Here
MAY 14 2024
05/14/2024
USPS

7022 0410 0002 7224 4113

Jason and Karen Kearns
42 N Sunset Ave
Sand Springs, OK 74063

for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Sand Springs, OK 74063

Certified Mail Fee $4.40

Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $0.00
- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4229

Sand Springs Home
PO Box 278
Sand Springs, OK 74063

for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Sand Springs, OK 74063

Certified Mail Fee $4.40

Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $0.00
- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4199

Paul and Holly Shreffler
86 N Sunset Ave
Sand Springs, OK 74063

for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Sand Springs, OK 74063

Certified Mail Fee $4.40

Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $0.00
- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4205

Robert and Virgina Humphrey
1625 Anderson Rd
Sand Springs, OK 74063

for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Sand Springs, OK 74063

Certified Mail Fee $4.40

Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $0.00
- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4212

Salvador and Belen Ruiz
19 Eagle Drive
Sand Springs, OK 74063

for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Sand Springs, OK 74063

Certified Mail Fee $4.40

Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $0.00
- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4236

Stephen and Chaleah Lane
29 N 194th W. Ave
Sand Springs, OK 74063

for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Tulsa, OK 74063

Certified Mail Fee $4.40

Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $0.00
- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4151

LPU Group Investments, LLC
8215 S Mingo Rd #150
Tulsa, OK 74133

for Instructions

9589 0710 5270 0407 3550 76

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

Sand Springs, OK 74063

OFFICIAL USE

Certified Mail Fee	$4.85
$	$4.10
Extra Services & Fees *(check box, add fee as appropriate)*	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.73
$	
Total Postage and Fees	$9.68
$	

0539 04

Postmark Here

JUL 24 2024

07/24/2024

USPS

Shell Creek Game Farms, LLC
466 N 177 West Ave
Sand Springs, OK 74063

for Instructions

9589 0710 5270 0407 3550 69

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

Sand Springs, OK 74063

OFFICIAL USE

Certified Mail Fee	$4.85
$	$4.10
Extra Services & Fees *(check box, add fee as appropriate)*	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.73
$	
Total Postage and Fees	$9.68
$	

0539 04

Postmark Here

2 4 2024

07/24/2024

USPS

Forrest Burns Trust
466 N 177 West Ave
Sand Springs, OK 74063

se for Instructions

27226845.00T-1
$17.00

UNITED STATES POSTAL SERVICE.

BLUE VALLEY
12433 ANTIOCH RD
OVERLAND PARK, KS 66213-9998
(800)275-8777

12/12/2024 12:12 PM

Product	Qty	Unit Price	Price
First-Class Mail® Letter	1		$0.73
Pawhuska, OK 74056			
Weight: 0 lb 0.50 oz			
Estimated Delivery Date			
Mon 12/16/2024			
Certified Mail®			$4.85
Tracking #:			
9589 0710 5270 0407 3551 06			
Return Receipt			$4.10
Tracking #:			
9590 9402 8817 4005 4753 57			
Total			$9.68

Grand Total: $9.68

Credit Card Remit $9.68
Card Name: MasterCard
Account #: XXXXXXXXXXXX7944
Approval #: 053998
Transaction #: 402
AID: A0000000041010
AL: MASTERCARD Chip
PIN: Not Required

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.
Pawhuska, OK 74056

OFFICIAL USE

Certified Mail Fee	$4.85	0539 04
Extra Services & Fees (check box, add fee as appropriate)	$4.10	
☐ Return Receipt (hardcopy)	$0.00	
☐ Return Receipt (electronic)	$0.00	Postmark Here
☐ Certified Mail Restricted Delivery	$0.00	
☐ Adult Signature Required	$0.00	
☐ Adult Signature Restricted Delivery	$	
Postage	$0.73	
Total Postage and Fees	$9.68	12/12/2024
Sent To	Osage Nation	
Street and Apt. No., or PO Box No.	PO Box 807	
City, State, ZIP+4®	Pawhuska, OK 74056	

9589 0710 5270 0407 3551 06

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

[redacted]d and [redacted]adine Hardy
[redacted]W Anderson Rd.
Sa[redacted] Springs, OK 74063

9590 9402 7313 2028 7061 46

2. Article Number *(Transfer from service label)*
022 0410 0002 7224 4304

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Dave Hardy ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Dave Hardy C. Date of Delivery 5-24-24

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

LPU Grou[redacted]vestments, LLC
8215 S Mi[redacted] Rd #15[redacted]
Tulsa, OK 74133

9590 9402 7313 2028 7062 14

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4151

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Danielle Coleman ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Danielle Coleman C. Date of Delivery 5/20/24

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 [redacted]turn Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

J[redacted]and Karen Kearns
42[redacted]Sunset Ave
Sa[redacted]Springs, OK 74063

9590 9402 7313 2028 7061 77

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4113

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [redacted] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Michae[redacted]d Teina Burns
818 An[redacted]rson Rd
Sand S[redacted]ngs, OK 74063

9590 9402 7313 2028 7062 38

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4175

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [redacted] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Michael Burns C. Date of Delivery 5-16-202[redacted]

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☑ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Karen [redacted]
1156 A[redacted]erson Rd
Sand Springs, OK 74063

9590 9402 7313 2028 7062 07

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4144

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Karen Wilder ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Karen Wilder
C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail [redacted]
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Sand [redacted]ings Home
PO Box 278
Sand Springs, OK 74063

9590 9402 7313 2028 7063 06

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4229

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Corrie Luker ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Corrie Luker
C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Jerry an[redacted]ggy Easter
PO Box 384
Sand Springs, OK 74063

9590 9402 7313 2028 7061 84

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4120

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Jerry Easter ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Jerry Easter
C. Date of Delivery 5-21-24

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

James [redacted]nd Christine King
1317 Anderson Rd.
Sand Springs, OK 74063

9590 9402 7313 2028 7061 60

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4106

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X James King ☐ Agent ☐ Addressee

B. Received by *(Printed Name)*
C. Date of Delivery 5/18/24

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Lyn[illegible]ngram and Nancy Delwater
11[illegible] N 197th W. Place
S[illegible] Springs, OK 740663

9590 9402 7313 2028 7062 21

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4168

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Nancy Ingram ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ro[illegible] and Virgina Humphrey
162[illegible] Anderson Rd
Sand S[illegible]gs, OK 74063

9590 9402 7313 2028 7062 69

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4205

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Paul and Holly Shreffler
186 N Sunset Ave
Sand Springs, OK 74063

9590 9402 7313 2028 7062 52

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4199

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Holly Shreffler ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Holly Shreffler | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Stanley and Barbara Gomez
20[illegible] First St
Sand Springs, OK 74063

9590 9402 7313 2028 7061 39

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4298

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Justin Burr | C. Date of Delivery 5/20/24

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

F[illegible] Burns Trust
4[illegible]77 West Ave
Sand[illegible]Springs, OK 74063

9590 9402 8817 4005 4754 18

2. Article Number *(Transfer from service label)*

1589 0710 5270 0407 3550 69

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X Emmitt Burns ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

JUL 30 2024

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Stone Creek Game Farms, LLC
[illegible] N 177 West Ave
[illegible]ings, OK 74063

9590 9402 8817 4005 4754 01

2. Article Number *(Transfer from service label)*
9589 0710 5270 0407 3550 76

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Emmett Burns ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ [illegible]nsured Mail
- ☐ [illegible]nsured Mail Restricted Delivery [illegible]over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
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PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SCS ENGINEERS
Environmental Consultants and Contractors
8575 W. 110th Street, Suite 100
Overland Park, KS 66210

CERTIFIED MAIL®

Retail

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RECEIVED JUN 24 2024

NIXIE 731 DE 1 0006/15/24
RETURN TO SENDER
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BC: 66210262025 *1428-04686-14-

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PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Osage Nation
PO Box 807
Pawhuska, OK 74056

9590 9402 8817 4005 4753 57

2. Article Number *(Transfer from service label)*

9589 0710 5270 0407 3551 06

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

Certified Mail

- A receipt (this portion of
- A unique identifier for y
- Electronic verification of delivery.
- A record of delivery (incl signature) that is retain for a specified period.

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- You may purchase Certi First-Class Mail®, First-(or Priority Mail® service
- Certified Mail service is International mail.
- Insurance coverage is n with Certified Mail servi of Certified Mail service Insurance coverage aut certain Priority Mail iten
- For an additional fee, an endorsement on the ma the following services:
  - Return receipt service of delivery (including You can request a har electronic version. For complete PS Form 38 *Receipt*; attach PS Fo

PS Form 3800, January 2

SCS ENGINEERS

Environmental Consultants and Contractors
8575 W. 110th Street, Suite 100
Overland Park, KS 66210

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9589 0710 5270 0407 3551 06

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Certified Mail Fee
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Extra Services & Fees *(check box, add fee as appropriate)*
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
$

Total Postage and Fees
$

Sent To

Street and Apt. No., or PO Box No.

City, State, ZIP+4®

Postmark Here

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

SCS ENGINEERS

Environmental Consultants and Contractors
8575 W. 110th Street, Suite 100
Overland Park, KS 66210

CERTIFIED MAIL®

9589 0710 5270 0407 3551 06

12/19

Osage Nation
PO Box 807
Pawhuska, OK 74056

NIXIE 731 DE 1
RETURN TO SENDER
UNCLAIMED
UNABLE TO FORWARD

UNC BC: 66210262025 *13

Retail

RDC 99

74056

$9.68
R2303S102079-04

U.S. POSTAGE PAID
FCM LETTER
OVERLAND PARK, KS 66213
DEC 12, 2024

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Osage Nation
PO Box 807
Pawhuska, OK 74056

9590 9402 8817 4005 4753 57

2. Article Number *(Transfer from service label)*

9589 0710 5270 0407 3551 06

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

Warranty Deed

Toby Bighorse - Osage County Clerk
Recorded/Filed on 05/31/2002 at 11:47AM Inst Type: WD
DOC: 2002-4864 Book 1090 Page 808 to 808 (1 pages)
Receipt Number: 2002-00004118 Fees: $8.00
DOC Stamps: $1549.50

GENERAL WARRANTY DEED

Ref. 800
Doc. 1,549.50

KNOW ALL MEN BY THESE PRENSENTS: That

FORREST E. BURNS, JR. and IDA BURNS, husband and wife ("Grantor"), in consideration of the sum of TEN AND NO/100 DOLLARS ($10.00) and other good and valuable consideration, the receipt and suffiency of which are hereby acknowledged, do hereby grant, bargin, sell and convey unto AMERICAN ENVIRONMENTAL LANDFILL, INC. ("Grantee") **ADDRESS:** 1430 W. 35th St. Tulsa, OK 74107, a certain tract of real property situated in Osage County, Oklahoma, described as follows, to wit:

NE/4 SE/4 and E/2 NW/4 SE/4 and NW/4 NW/4 SE/4 and the South 50' of the East 1,165.11 feet of the SE/4 NE/4, Section 36, T20N, R10E, Osage County Oklahoma,

together with all the improvements thereon and appurtenances thereunto belonging, LESS AND EXCEPT the reservation of the oil gas, coal and other minerals to the Osage Tribe of Indians created by Act of Congress, June 28, 1906 (34 Stat. L. 539) and Acts amendatory thereof and supplementary thereto; and SUBJECT TO all easements, rights-of-way, retrictive covenants, building restrictions of record, ordinances, and special assessments not yet due, and warrants, the title to the same.

Douglas Boyd
1717 E 15th St.
Tulsa, OK 74104

TO HAVE AND TO HOLD said described premises unto the Grantee, Grantee's successors and assigns forever free, clear and discharged of and from all former grants, claims charges, taxes judgments, mortgages and other liens and encumbrances whatsoever, EXCEPT FOR and SUBJECT TO those mattes set forth hereinabove. PROVIDED that Ida Burns joins in the execution of this deed only for the purpose of disclaiming any homestead rights which she might have in the property being conveyed. She claims no ownership in said property nor makes any warranties in regard thereto.

EXECUTED and delivered this 29th day of ~~March~~ May, 2002.

Forrest E. Burns Jr.
FORREST E. BURNS, JR.,

Ida B Burns
IDA BURNS

STATE OF OKLAHOMA
OSAGE COUNTY
DOC. STAMPS $ 1,549.50

BK 1090 PG 0808
004864

STATE OF OKLAHOMA, OSAGE COUNTY, ss:

The foregoing deed was acknowledged before me this 29th day of ~~March~~ May, 2002, by Forrest E. Burns, Jr. and Ida Burns, husband and wife.

Jane Kibble
Notary Public

OFFICAL SEAL:

My commission expires: July 29, 2004
12002

Oklahoma
OFFICIAL SEAL
JANE KIBBLE
Tulsa County

I-2005-006539 07/27/2005 11 50 am
Book 1233 Page(s) 0737-0737
Fee: $ 13.00 Doc: $ 1,533 75
Denny Hutson - Osage County Clerk
State of Oklahoma

GENERAL WARRANTY DEED

THIS INDENTURE, Made this 12th day of August, 2003 between Forrest E. Burns, Jr., Grantor, and American Environmental Landfill, Inc., Grantee.

WITNESSETH, That in consideration of the sum of Ten Dollars ($10.00), the receipt of which is hereby acknowledged, Grantor by these presents, does grant, bargain, sell and convey unto Grantee, its successors and assigns, all of the following described real estate, situated in the County of Osage, State of Oklahoma, to-wit:

06539

BK 1233 PG 0737

SURFACE OF

Lots 3 and 4 and the N/2 SW/4 and S/2 S/2 NW/4 and an approximate 3 acre tract being the North 198 feet of the SW/4 NW/4 SE/4 all in Section 36, Township 20 North, Range 10 East Osage County, Oklahoma, LESS AND EXCEPT a tract of land being a part of the S/2 S/2 NW/4, Section 36, being more particularly described as commencing at the SE corner of said NW/4, thence North 00°06'30" West along the East line of said NW/4 a distance of 674.92 feet; thence South 88°42'49" West along the North line of the S/2 of the S/2 of the NW/4 a distance of 921.97 feet to the point of beginning; thence South 01°01'16" East a distance of 608.04 feet; thence South 88°58'44" West and parallel to the South line of said NW/4 a distance of 400 feet; thence North 01°01'16" East a distance of 606.18 feet to a point on the North line of the S/2 of the S/2 of said NW/4; thence North 88°42'49" East along the North line of the S/2 of the S/2 of said NW/4 a distance 400 feet to the point of beginning, said tract of land containing 5.575 acres more or less,

and

The E/2 SE/4 NE/4 and E/2 NE/4 SE/4 and Lot 3, Section 35, Township 20 North, Range 10 East, Osage County, Oklahoma.

TO HAVE AND TO HOLD THE SAME, together with all and singular the tenements, hereditaments and appurtenances, thereto belonging, or in any wise appertaining forever.

And said Grantor, his heirs, executors, administrators and successors do hereby covenant, promise and agree to and with said party Grantee at delivery of these presents that he is lawfully seized in his own right of an absolute and indefeasible estate of inheritance in fee simple, of and in all singular the above granted and described premises, with appurtenances; that the same are free, clear, and discharged and unencumbered of and from all former and other grants, titles, charges, states, judgments, taxes, assessments and encumbrances, of whatsoever nature and kind, EXCEPT: easements and building restrictions of record and that said Grantor will WARRANT AND FOREVER DEFEND the same unto the said Grantee, its successors and assigns, against said Grantor, its heirs or assigns and all and every person or persons whomsoever lawfully claiming or to claim the same.

IN WITNESS WHEREOF, The said Grantor has caused these presents to be signed the day first above written.

Forrest E. Burns Jr.
FORREST E. BURNS, JR.

STATE OF OKLAHOMA)
) ss
COUNTY OF TULSA)

STATE OF OKLAHOMA
OSAGE COUNTY
DOC. STAMPS $ 1533.75

ACKNOWLEDGMENT

This instrument was acknowledged before me this 12 day of August 2003, by Forrest E. Burns, Jr.

Susan J. Bundy
Notary Public
Commission No. 03002703

My Commission Expires: 6-2-07

SUSAN J. BUNDY
NOTARY PUBLIC
IN AND FOR
STATE OF OKLAHOMA
TULSA COUNTY

NOT AN OFFICIAL COPY

I-2018-003789 06/06/2018 8:59 am
Book 1686 Page(s) 0857-0860
Fee $ 19.00 Doc $ 4,997.25
Sheila Bellamy - Osage County Clerk
State of Oklahoma

Tax information sent to:
1420 W. 35th St.
Tulsa, Ok 74107

Documentary Stamps: $4,997.25

TRUSTEE'S DEED

(4)
14.00
5.00
4997.25
by
CW

KNOW ALL PERSONS BY THESE PRESENTS:

That Central National Bank & Trust Company of Enid, Oklahoma, Successor Trustee of The Forrest E. Burns, Jr. Revocable Trust, dated January 23, 2003 ("Grantor"), in consideration of the sum of TEN AND NO/100 DOLLARS ($10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, does hereby grant, bargain, sell and convey unto American Environmental Landfill, Inc., an Oklahoma corporation (the "Grantee), all interest in and to the real property situated in Osage County, State of Oklahoma, and more particularly described as follows, to-wit:

(See Exhibit "A" attached hereto and made a part hereof)

TO HAVE AND TO HOLD said described premises unto the Grantee, and Grantee's heirs, successors and assigns forever, free, clear and discharged of and from all former grants, claims, charges, taxes, judgments, mortgages and other liens and encumbrances whatsoever, except easements and restrictions of record.

This conveyance is made without warranty, express or implied, but there is, however, assigned unto Grantee all of the right, title and interest of Grantor in and to any and all warranties and covenants of or concerning title heretofore made by any person or other legal entity with respect to the above described real estate, and Grantee shall have the same rights with respect to such warranties and covenant and the enforcement thereof as Grantor now has.

Executed and delivered this 1st day of June, 2018.

Central National Bank & Trust Company of Enid, Oklahoma, Successor Trustee of The Forrest E. Burns, Jr. Revocable Trust, dated January 23, 2003

By: _____
R. Patrick Anderson, Senior Vice President and Trust Officer

VIEW ADDITIONAL LAND RECORDS AT OKCOUNTYRECORDS.COM

STATE OF OKLAHOMA
OSAGE COUNTY
DOC. STAMPS $ 4997.25

Guaranty Abstract Company
P.O. Box 3048
Tulsa, Oklahoma 74101

Filed by Guaranty Abstract Company
and return to Janel / carla Hall

003789 BK 1686 PG 0857

NOT AN OFFICIAL COPY

STATE OF OKLAHOMA)
) ss.
COUNTY OF TULSA)

This instrument was acknowledged before me this 1 day June, 2018 by R. Patrick Anderson, as Senior Vice President and Trust Officer of Central National Bank & Trust Company of Enid, Oklahoma, as Successor Trustee of The Forrest E. Burns, Jr. Revocable Trust, dated January 23, 2003.

Notary Public

My commission expires:
11/12/21
Commission # 01016821
(Seal)

CARLA J. HALL NOTARY PUBLIC STATE OF OKLAHOMA TULSA COUNTY

BK 1686 PG 0858

VIEW ADDITIONAL LAND RECORDS AT
OKCOUNTYRECORDS.COM

NOT AN OFFICIAL COPY

Exhibit "A"
Legal Description

The North Half of the Northeast Quarter (N/2 NE/4) of Section Thirty-five (35), Township Twenty (20) North, Range Ten (10) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

Lots One (1), Two (2), Three (3), Four (4), Five (5), Six (6), Seven (7), Eight (8), Nine (9), Ten (10), Eleven (11), Twelve (12), Thirteen (13), Fourteen (14), Fifteen (15), Sixteen (16), Seventeen (17), Eighteen (18), Nineteen (19), Twenty (20), Twenty-one (21), Twenty-two (22), Twenty-three (23), Twenty-four (24), Twenty-five (25) and Twenty-six (26), Block One (1), CANVILLE ADDITION to Osage County, State of Oklahoma, according to the recorded Plat thereof.

Lot Two (2) (SW/4 NW/4) and Lot Three (3) (NW/4 SW/4) of Section Thirty-one (31), Township Twenty (20) North, Range Eleven (11) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

The North Half of the South Half of the Northwest Quarter (N/2 S/2 NW/4) of Section Thirty-six (36), Township Twenty (20) North, Range Ten (10) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

The North Half of the Northwest Quarter (N/2 NW/4) of Section Thirty-six (36), Township Twenty (20) North, Range Ten (10) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

Lot One (1) (SE/4 SE/4) and Two (2) (SW/4 SE/4);
AND the North Half of the Southeast Quarter (N/2 SE/4), LESS AND EXCEPT the East Half of the Northeast Quarter of the Southeast Quarter (E/2 NE/4 SE/4);
AND the South Half of the Northeast Quarter (S/2 NE/4), LESS AND EXCEPT the East Half of the Southeast Quarter of the Northeast Quarter (E/2 SE/4 NE/4);
AND the Northeast Quarter of the Southwest Quarter (NE/4 SW/4), LESS AND EXCEPT, the West 900 feet of the North 1,200 feet thereof AND LESS AND EXCEPT the West 740 feet of the remainder of the NE/4 SW/4;
All in Section Thirty-five (35), Township Twenty (20) North, Range Ten (10) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

OKLAHOMALANDRECORDS.COM

BK 1686PG0859

The East Half of the Northwest Quarter (E/2 NW/4) of Section Thirty-five (35), Township Twenty (20) North, Range Ten (10) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

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VIEW ADDITIONAL LAND RECORDS AT
OKCOUNTYRECORDS.COM

Section 3.7 of the Permit Narrative

3.6 AIR QUALITY

The AEL will conform to applicable ambient air quality and source control regulations. The AEL's current permitted capacity is greater than 2.5-million-cubic-yards as detailed in Section 6.2.1 and is subject to 40 CFR 60, Subpart XXX permitting. AEL operates under Operating Permit No. 2018-1562-TVR2. Odors will be controlled at the site through proper operations and, more specifically, through proper application of daily, intermediate, and final cover. Cover requirements are further discussed in Section 13. Dust and emission control is discussed in the site's Operations Plan included in Appendix I.

3.7 VARIANCE REQUEST

This permit modification includes one variance requests in accordance with OAC 252:515-3-32. The variance requests is for the location of the permit expansion with an area designated as alluvium or terrace deposits.

OAC 252:515-5-51 (a)(1) states that no area within the permit boundary of a new land disposal facility, or expansion of the permit boundary of an existing land disposal facility, shall be located within an area designated as alluvium or terrace deposits and their recharge areas, as shown on "Map of Aquifers and Recharge Areas in Oklahoma" compiled by Kenneth S. Johnson, Oklahoma Geological Survey (1991). As allowed by O.A.C. 252:515-5-51 (a)(2), Site-specific hydrological and geological data and other information may be submitted to demonstrate clearly and convincingly that the proposed location does not lie in a prohibited area.

Figure 2.5 of Appendix B contains a map showing the permit area on the referenced map is near an area designated as terrace or alluvium deposits. This map indicates there may be a portion of the proposed expansion that overlaps the area identified as terrace deposits on the map. However, as discussed in the Work Plan, previous boring logs from the Phase IV area east of the 203-acre expansion indicate sandstones and shales underlay the expansion site, which are consolidated formations and not terrace deposits. Borings performed for this investigation, only identified a few areas where unconsolidated materials will be beneath the planned expansion excavation and the materials were identified primarily as silty clay or sandy clay. Materials composed of primarily silt or primarily sand, indicative of terrace deposits, were not identified below the planned expansion excavation. However, few borings south of the planned waste boundary encountered material comprised primarily of sand and/or silt indicative of terrace deposits. Figure 3.4 of Appendix B, show the proposed excavation grades within the waste disposal boundary are within the bedrock that underlies the site. Figure 3.3 of Appendix B shows the proposed excavation grades that are outside the limits of waste and are located in an area proposed for a stormwater detention structure. As detailed in Appendix G, any unstable areas will be undercut to firm material and refilled with suitable compacted earth fill.

By removing unsuitable material and compacting the subgrade in accordance with the QAQC Plan, this design will meet the protection afforded by OAC 252:515-5-51(a).

Section 6 of Groundwater Monitoring Plan

6.0 DATA EVALUATION

This section outlines the proposed evaluation methodology that will be used for the detection of a release from the facility, utilizing PQLs (EQLS) as the reporting concentration limits for VOCs, and the Shewart-CUSUM control chart and/or Prediction Limits statistical comparisons. Data evaluation will be performed in accordance with the March 2009 Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance EPA 530/R-09-007 (Unified Guidance)

Background

During background sample collection it will be necessary to examine the data for outliers, anomalies, and trends that might be an indication of a release. Outliers and anomalies are inconsistently large or small values that can occur due to sampling, laboratory, transportation or transcription errors, or even by chance alone. Significant trends indicate a source of systematic error or an actual contamination occurrence that must be evaluated and corrected before the detection monitoring program can be implemented. The inclusion of such values in the historical database used for statistical evaluation could cause misinterpretation of the data set and result in an artificial increase in the magnitude of statistical limits, which could result in an increase in the false negative rate (i.e., a decrease in the sensitivity of the statistical procedure).

To remove the possibility of historical outliers and trends creating false statistical limits, the data for each well and each constituent will be tested for the existence of outliers in accordance with Chapter 12 of the Unified Guidance.

Outlier Analysis

A statistical outlier is a value that is discrepant from the other values in the data set. The outlier tests identify data points that do not appear to fit the distribution of the rest of the data set and determine if they differ significantly from the rest of the data. A value is considered to be suspect if it is an order of magnitude larger or smaller than the rest of the data. Sanitas employs the use of Dixon's, Rosner's and Tukey's Outlier Tests based on the number of values (n) in the dataset and number of non-detect values. The Outlier Test criteria is as follows:

- Parametric data with n > 20 analyzed using Dixon's Outlier Test.
- Parametric data with n < 20 analyzed using Rosner's Outlier Test.
- Non-parametric data analyzed using Tukey's Outlier Test.

Once a value is identified as a statistical outlier, it is checked for possible lab instrument failure, field collection problems, or data entry errors. However, outliers may exist naturally if there is an extremely wide inherent or temporal variability in the data. The Unified Guidance states that unless a likely error can be identified, the outlier should not be removed (Unified Guidance Section 5.2.3).

Sen's Slope/Mann-Kendall Statistical Analysis

A trend is a general increase or decrease in observed values of a variable over time. A trend analysis can be used to evaluate the significance of an apparent trend and to estimate the magnitude of that trend. Statistically significant trends may indicate a potential source of systemic error or contamination occurrence.

The statistical outlier and trend detection procedure will be performed for those wells that have had at least five (5) measurements for a given constituent. Once the background database is established, the outlier procedure described above may be applied and appropriate statistical limits set in accordance with the Unified Guidance.

6.1 STATISTICAL METHODOLOGY

For Detection Monitoring, this program will involve intra-well and inter-well analysis based on a comparison of well constituent concentrations to background data. Data evaluation will be performed in accordance with the Unified Guidance.

Interwell Statistical Analysis

The interwell comparison utilizes control charts or non-parametric prediction limits for statistical comparison of inorganic parameters. An interwell control chart analysis compares data collected from compliance (downgradient) monitoring wells with data collected from background (upgradient) monitoring wells. If a data point exceeds the calculated interwell prediction limit, then a statistically significant exceedance is noted. The distribution of the data was calculated by applying the Shapiro-Wilk test for normality, or the Ladder of Powers (Helsel & Hirsh, 1992) for transformed data. A parametric prediction limit was constructed for data determined to have a normal or transformed normal distribution. A non-parametric prediction limit was calculated for data not transformed normal or containing 51 percent to 90 percent non-detect results. A Poisson based prediction limit was calculated for data with greater than 90 percent non-detect results. This analysis is used for wells in detection monitoring to compare the current compliance data collected from the downgradient wells to the pooled historical background data from the upgradient wells.

Intrawell Analysis

The intrawell statistical method compares the most recent measurement at an individual monitoring well to its own historical background data set for a given parameter. The resulting statistical analysis produces a limit from the background data set to which the most recent measurements are compared.

The intrawell comparison utilizes control charts or non-parametric prediction intervals for statistical comparison of inorganic parameters. Intrawell control chart statistics compare each new measurement of an individual monitoring well to its own historical background data set for a given parameter. The resulting statistical analysis produces a control limit to which each new measurement is compared. Additionally, the cumulative sum (CUSUM) of each successive monitoring result is incorporated into the statistical analysis, which provides for detection of gradual and immediate trends. Trends are identified even if the actual results are below the control limit. For those parameters that are detected at least once, but less than 25 percent of the time, or are non-normal in distribution, a nonparametric prediction interval statistic is used. The Shewhart-CUSUM control chart statistical procedure requires a minimum of 8 background samples for computation of the statistical limit.

6.2 VOLATILE ORGANIC COMPOUNDS

PQLs asses if the quantitative value of the analyte is close to the measured value. Conversely, method detection limits (MDLs) indicate that the analyte is present in the sample with a specified degree of confidence. For analytes with estimated concentrations greater than the MDL but not the

PQL, it can only be concluded that the true concentration is greater than zero; the actual concentration cannot be determined.

The use of laboratory-specific PQLs (or EQLs) already incorporates a measure of the statistical uncertainty that is associated with the measurement process. Any VOC detected and verified at a concentration above the PQL (or EQL) would be statistically significant, and therefore trigger assessment monitoring. These decision rules apply only in cases where the constituent has rarely, or never, been detected in the background. VOCs detected at concentrations between the MDL and PQL will be reported but will not be considered statistically significant unless a verified concentration above the PQL is detected.

6.3 INORGANIC PARAMETERS

The statistical methodology for inorganic parameters in Detection Monitoring will include an intra-well and inter-well comparison of the detected constituent to the background data population for that constituent. The statistical limits for the background data set will be calculated using normal, lognormal, and nonparametric prediction limits depending on the distribution of the data set. A statistical program using combined Shewhart-CUSUM control charts and/or Prediction Interval Limits will be utilized in accordance with Unified Guidance Chapters 18-20.

For new monitoring wells, once four (4) rounds of background samples and one (1) detection event have been collected, an appropriate statistical method will be proposed to evaluate the data from these wells. Data evaluation will be performed in accordance with the Unified Guidance.

6.4 Detection Verification Procedure

Verification re-sampling is an integral part of the statistical methodology described by the Unified Guidance. Without verification re-sampling, much larger statistical limits would be required to achieve site-wide false positive rates of 5% or less. Furthermore, the resulting false negative rate would be greatly increased. The following procedure will be performed for each constituent determined to be initially above its statistical limit. Only constituents that initially exceed their statistical limit will be sampled for verification purposes. The use of a “pass 1 of 2” verification option will be implemented to manage the site-wide false positive and false negative rates in accordance with the Unified Guidance. The initial verification sampling event will be conducted no more than 30 days after the determination of the initial exceedance.

Section 2 of the Salvage and Recycling Plan

2.0 SALVAGE AND RECYCLING WORK PLAN

The following work plan details methods of collection and transportation of recyclable materials both to and from the disposal site. Recyclable materials will be collected by and transported to the disposal site by users of the facility. Upon arriving at the site, recyclable material will be weighed at the facility scale house and directed to the salvage and recycling area.

If material is identified at the working face of the landfill, as suitable and practicable for salvage and recycling activities, the recyclable materials will be removed by facility staff and taken to the salvage and recycling area. When the AEL has collected enough material for the market and there appears to be a financial benefit, the recyclable material will be weighed and transported to the appropriate vendor(s).

2.1 SALVAGEABLE AND RECYCLABLE MATERIAL

This salvage and recycling plan includes, but is not limited, to the following materials:

- Miscellaneous metal products, e.g., refrigerators, stoves, dryers, sheet metal, etc.
- Freon removed from the above recycled miscellaneous metal products, e.g., refrigerators, etc.
- Tires
- Wooden cross-ties
- Wood, e.g., tree limbs, stumps, branches, brush, lumber, pallets
- Uncontaminated rock, dirt, concrete, bricks, and solidified asphalt
- Other materials found appropriate to recycle and/or beneficial reuse

These materials will be sorted and stored in separate piles and will be spaced adequately to allow for a fire lane and allow for vehicle access. When storing tires, the facility should adhere to the Tire Fire and Mosquito Prevention Tips included in Attachment B. The storage of any putrescible wastes at the salvage and recycling area is not expected. The operation of this salvage and recycling area should not significantly add to the population of insects or animals not already present at the disposal facility. These recyclable materials are innocuous and will not negatively impact the environment. Freon removal from recycled metal products will be conducted by an AEL employee or third party licensed to remove Freon.

This plan allows for chipping, shredding, or grinding wood material to produce a product for beneficial reuse at the facility. Excessive wood material will be processed when sufficient volumes exist to constituent economic feasibility. Uncontaminated rock, concrete, bricks, and solidified asphalt found suitable for beneficial reuse by the facility may be used as erosion and run-on/off controls, for site improvements, etc. Uncontaminated soil suitable for reuse may be used as daily or intermediate cover if the laboratory reports received during the waste approval process indicate no analytical parameters above laboratory detection limits. Per OAC 252:515-19-51(d), uncontaminated soil used as daily cover is capable of controlling disease vectors, fires, odors and blowing litter without presenting a threat to human health or the environment. Per OAC 252:515-19-52(d),

uncontaminated soil used as intermediate cover is capable of minimizing infiltration of water and sustaining vegetation while being free of garbage, trash, or other unsuitable material.

2.2 COLLECTED MATERIALS MANAGEMENT

The collected materials will be transported to the following applicable facilities or suitable equivalents:

- Miscellaneous metal products will be recycled by a metal recycling facility
- Freon will be transported to a refrigerant recycling facility
- Tires will be transported to a tire recycling facility
- Wooden cross-ties will be used by the AEL in the construction of site improvements
- Wood materials will be chipped and used in the construction of site improvements
- Uncontaminated rock, dirt, concrete, bricks, and solidified asphalt will be used by the AEL in the construction of site improvements

The materials collected will be stored according to the following time limits to ensure compliance with the one (1) year accumulation limit. Materials exceeding these storage durations will be classified and managed as solid waste:

- Miscellaneous metal products: Stored for up to **6 months**
- Freon: Stored for up to **6 months**
- Tires: Stored for up to **3 months**
- Wooden Cross-Ties: Stored **as used**
- Processed wood material: Stored for up to **3 months** or **as used**
- Uncontaminated rock, dirt, concrete, bricks, and solidified asphalt: Stored **as used**

This salvage and recycling plan does not include any processing of waste at locations away from the facility. The landfill will accept source-separated recyclable materials if they pay the appropriate landfill fees. Material recycled by the facility will be weighed prior to transportation offsite or reuse.

2.3 SALVAGE AND RECYCLING DOCUMENTATION

On the monthly report to ODEQ, the AEL will submit the amount of material recycled and the date sent or used. A copy of this Salvage and Recycling Plan will be maintained at the AEL. Additions or changes to this plan will be maintained onsite and available for review upon request from ODEQ.

Attachment B

Tier III Permit Application

APPLICATION TO MODIFY A SOLID WASTE DISPOSAL FACILITY PERMIT

Date: May 20, 2024 County: Osage

Send to:

Solid Waste Permitting Unit
Land Protection Division
Dept. of Environmental Quality
707 N. Robinson (PO Box 1677)
Oklahoma City, OK
73101-1677

FOR DEQ USE

DEQ Log No. _____
No. Copies _____

Date Received: _____

American Environmental Landfill, Inc. proposes to modify the permit of
(Applicant's Name)
the American Environmental Landfill, located at See Attached
(Facility Name) *(Exact legal description:*

metes & bounds, platted lot, or land survey. Append extra sheets if necessary)

in Osage County, Oklahoma. We hereby make application for a modification of existing permit number 3557021 as required by the **Oklahoma Solid Waste Management Act** and the Rules pursuant thereto.

Remarks & brief description of proposed modification:
Approximate 203 acre expansion of the landfill permit boundary.

Applicant or Authorized Agent:

Signature

Todd Green
Typed Name

Address: 1420 W. 35th Street, Suite B
City: Tulsa State: OK

Date signed: 5-21-24
Phone: (918) 245-7786

Preparing Engineer:

Signature

Floyd Cotter
Typed Name

Address: 8575 W. 110th St. Suite 100
City: Overland Park State: KS

Date signed: 5-22-24
Phone: 913-681-0030

Facility Address (if any):
212 North 177th West Avenue
Sand Springs, Oklahoma 74063

DEQ USE ONLY

July 2016
DEQ Form #515-020

VERIFICATION[1]

STATE OF OKLAHOMA)
) ss
COUNTY OF Tulsa)

Todd Green, of lawful age, being first duly sworn, upon oath state that I have read the foregoing APPLICATION TO MODIFY A SOLID WASTE DISPOSAL FACILITY PERMIT, that I am familiar with the matters set forth therein, and that the same are true to the best of my information and belief.

American Environmental Landfill, Inc.
Applicant

Subscribed and sworn to before me this 21st day of May, 2024,
by Sarah Abbott (Applicant or legal representative).

SARAH ABBOTT
Notary Public In and
STATE OF OKLAHO
Commission #2100
Expires: 12 Apr 2025

Notary Public

My commission expires:

April 12, 2025

[1] This Verification is required for a Tier III modification application.

American Environmental Landfill, Inc. Legal Description:

The Northeast Quarter (NE/4) of the Southeast Quarter (SE/4) and the East Half (E/2) of the Northwest Quarter (NW/4) of the Southeast Quarter (SE/4) and the Northwest Quarter (NW/4) of the Northwest Quarter (NW/4) of the Southeast Quarter (SE/4) of Section 36, Township 20 North, Range 10 East of the Indian Meridian, Osage County, Oklahoma.

AND

A tract of land being a part of the West Half (W/2) of Section 36 and the East Half (E/2) of Section 35, Township 20 North, Range 10 East of the Indian Meridian, Osage County, Oklahoma and being more particularly described as follows:

BEGINNING at the Southwest corner of said Section 36;

Thence North 01°10'20" East along the West line of said Section 36, a distance of 354.62 feet to the Southwest corner of the North Half (N/2) of the Southwest Quarter (SW/4) of said Section 36;

Thence South 89°15'49" West along the South line of the East Half (E/2) of the Northeast Quarter (NE/4) of the Southeast Quarter (SE/4) of said Section 35, a distance of 320.25 feet;

Thence North 01°03'24" West, a distance of 1413.21 feet;

Thence North 88°56'36" East, a distance of 273.38 feet;

Thence North 00°03'14" East parallel to and 100.00 feet West of the East line of the Northeast Quarter (NE/4) of said Section 35, a distance of 564.60 feet;

Thence North 88°42'49" East a distance of 100.03 feet to the Northwest corner of the South Half (S/2) of the South Half (S/2) of the Northwest Quarter (NW/4) of said Section 36;

Thence continuing North 88°42'49" East along the North line of the South Half (S/2) of the South Half (S/2) of the Northwest Quarter (NW/4) of said Section 36, a distance of 1318.42 feet;

Thence South 01°01'16" East, a distance of 606.18 feet;

Thence North 88°58'44" East, a distance of 400.00 feet;

Thence North 01°01'16" West, a distance of 608.04 feet to a point on the North line of the South Half (S/2) of the South Half (S/2) of the Northwest Quarter (NW/4) of said Section 36;

Thence North 88º42'49" East along the North line of the South Half (S/2) of the South Half (S/2) of the Northwest Quarter (NW/4) of said Section 36, a distance of 921.97 feet to the Northeast corner of the South Half (S/2) of the South Half (S/2) of the Northwest Quarter (NW/4) of said Section 36;

Thence South 00º06'30" East along the East line of the West Half (W/2) of said Section 36, a distance of 2360.46 feet to the Southeast corner of the Southwest Quarter (SW/4) of said Section 36;

Thence South 89º16'14" West along the South line of the Southwest Quarter (SW/4) of said Section 36, a distance of 2679.26 feet to the POINT OF BEGINNING.

Said tract of land contains 150.09 acres, more or less.

AND

The South 50.00 feet of the East 1165.11 feet of the Southeast Quarter (SE/4) of the Northeast Quarter (NE/4) of Section 36, Township 20 North, Range 10 East of the Indian Meridian, Osage County, Oklahoma.

Said tract of land contains 1.34 acres, more or less.

AND

A Tract of land in the East Half (E/2) of Section Thirty-five (35) and the West Half of the West Half (W/2 W/2) of Section Thirty-six (36), Township Twenty (20) North, Range Ten (10) East of the Indian Meridian, Osage County, Oklahoma and being more particularly described as follows:

BEGINNING at the Southeast Corner of said Section 35;

Thence S89°51'44"W on the South Line of said Section 35 a distance of 2,624.40 feet to the Southwest Corner of said E/2;

Thence N0°10'55"E on the West Line of said E/2 a distance of 2,083.00 feet;

Thence N44°26'58"E a distance of 1,254.02 feet to a point on the South Line of the North Half of the Northeast Quarter (N/2 NE/4) of said Section 35;

Thence N16°00'28"E a distance of 330.70 feet;

Thence N88°51'08"E parallel with the North Line of said E/2 a distance of 1684.00 feet to a point on the East Line of said Section 35;

Thence N87°55'47"E parallel with the North Line of said W/2 W/2 of Section 36 a distance of 1319.51 feet to a point on the East Line of said W/2 W/2;

Thence S0°03'02"E on the East Line of said W/2 W/2 a distance of 1006.10 feet to the Southeast Corner of the North Half of the Southwest Quarter of the Northwest Quarter (N/2 SW/4 NW/4) of said Section 36;

Thence S88°42'53"W on the South Line of said N/2 SW/4 NW/4 a distance of 1.84 feet to a Chiseled Cross found for a corner of the existing Permit Boundary (also the Northwest Corner of the tract known as the Cemetery, as described in JOURNAL ENTRY OF JUDGEMENT, Recorded in Book 1429 @ Page 693);

Thence continuing S88°42'53"W on the existing Permit Boundary and on the South Line of said N/2 SW/4 NW/4 a distance of 1318.20 feet to the Southwest Corner of said N/2 SW/4 NW/4;

Thence continuing S88°42'53"W on the existing Permit Boundary, entering said Section 35, a distance of 100.03 feet;

Thence S0°00'35"W on the existing Permit Boundary, parallel with the East Line of said Section 35 a distance of 564.60 feet;

Thence S88°57'36"W on the existing Permit Boundary a distance of 273.49 feet;

Thence S1°02'24"E on the existing Permit Boundary a distance of 1413.79 feet to a point on the South Line of the Northeast Quarter of the Southeast Quarter (NE/4 SE/4) of said Section 35;

Thence N89°12'15"E on the existing Permit Boundary and on the South Line of said NE/4 SE/4 a distance of 320.25 feet to the Southeast Corner of said NE/4 SE/4;

Thence S1°11'51"W on the existing Permit Boundary and on the East Line of said Section 35 a distance of 354.62 feet to the POINT OF BEGINNING, containing 202.5 acres more or less.

Tier III Permit Application
American Environmental Landfill

American Environmental Landfill, Inc.
207 North 177th West Avenue
Sand Springs, Oklahoma 74063

SCS ENGINEERS

27220345.00 | May 2024
Revised February 2025

8575 W. 110th Street, Suite 100
Overland Park, KS 66210
913-681-0030

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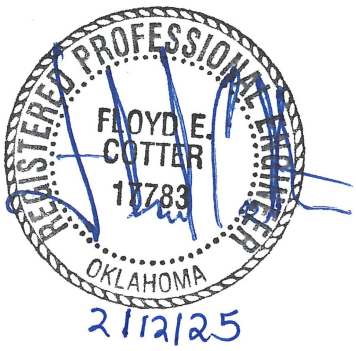
CERTIFICATION

This report has been prepared for exclusive use by American Environmental Landfill, Inc. for the American Environmental Landfill (AEL) for specific application to the project discussed, and it has been prepared in accordance with good engineering practices including consideration of industry standards and the requirements of the Oklahoma Department of Environmental Quality.

Prepared by:



Floyd Cotter, PE
SCS Engineers

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1.0 INTRODUCTION

SCS Engineers, on behalf of American Environmental Landfill, Inc., is submitting the necessary documents to expand the permit boundary, establish permit base grades for such area, and permit a leachate storage impoundment at the American Environmental Landfill (AEL). The AEL is located near Sand Springs, Oklahoma in Sections 35 and 36, Township 20 North, Range 10 East, in Osage County, Oklahoma. The project site is on the Wekiwa Oklahoma 7.5 Minute USGS Quadrangle map. AEL is bordered by the Arkansas River to the South (Figure 1). The AEL operates under the Oklahoma Department of Environmental Quality (ODEQ) Permit Number 3557021.

The current landfill has a permit boundary of approximately 222-acres, 150 of which are currently in operation. The proposed landfill lateral expansion area is approximately 203-acres located north and west of the existing permit boundary. Therefore, following approval of a Tier III permit modification, in accordance with Oklahoma Department of Environmental Quality (ODEQ), Oklahoma Administrative Code (OAC) 252:4-7-60, the landfill permit boundary will be comprised of approximately 425-acres. The proposed lateral expansion area will be utilized for a municipal solid waste (MSW) disposal area.

The AEL, (then Shell Creek Landfill) was issued Permit No. 3557021 on September 14, 1981 by the Oklahoma Department of Environmental Quality (ODEQ) and operates as a Subtitle D facility.

2.0 FILING OF APPLICATION & PUBLIC PARTICIPATION

In accordance with the Uniform Environmental Permitting Act and OAC 252:4-7-13(g)(1), the AEL will publish notice of the filing of this application in *The Sand Springs Leader* newspaper. The published notice will serve as the legal notice to the public. The publication will identify locations where the application may be reviewed by the public, including a location in Osage County, where the site is located. The publication will include notice of a 30-day opportunity to request a process meeting. If the ODEQ receives timely requests and determines that a significant degree of public interest in the application exists, the ODEQ shall schedule and hold a process meeting. In addition, notices will be provided by certified mail and return receipt request to adjacent landowners whose property may be affected by the lateral expansion of the AEL.

Upon conclusion and approval of the technical review for this Tier III application, the ODEQ will prepare a draft permit. Notice of the draft permit shall be given by the AEL by publishing a legal notice in *The Sand Springs Leader* newspaper. The notice shall identify locations where the draft permit and the application may be reviewed by the public, including a location in Osage County, where the site is located. The publication will include notice of a 30-day opportunity to request a public meeting on the permitting process. If the ODEQ receives timely requests and determines that a significant degree of public interest in the application exists, the ODEQ shall schedule and hold a public meeting. In addition, notices of the draft permit will be provided by certified mail and return receipt request to adjacent landowners whose property may be affected by the lateral expansion of the AEL.

Should the ODEQ determine the need for a public meeting, the ODEQ shall expeditiously schedule and hold a formal public meeting no more than 120 days after the date the notice was published. The public meeting shall be held at a location convenient to and near the AEL. At the meeting, any person may submit oral or written statements and data concerning the draft permit or permit application. The public comment period shall automatically be extended at the close of the public meeting. A representative of the AEL shall be present at the meeting to respond to questions.

After the public comment period, the ODEQ shall prepare a response to comments and issue a final denial or a proposed permit. If a proposed permit is prepared, the AEL shall provide notice of the proposed permit by publishing a legal notice in The Sand Springs Leader newspaper. The notice shall identify locations where the proposed permit and the ODEQ response to comments may be reviewed by the public, including a location in Osage County, where the site is located. The publication will include notice of a 20-day opportunity to request an administrative hearing. In addition, notices will be provided by certified mail and return receipt request to adjacent landowners whose property may be affected by the lateral expansion of the AEL.

The opportunity to request an administrative hearing shall be available to the AEL and any person or qualified interest group who claims that the construction or operation of the landfill would directly and adversely affect their interests. If no written administrative hearing request is received by the ODEQ by the end of the 20-day opportunity, the final permit shall be issued.

If an administrative hearing is timely requested on the proposed permit, the ODEQ shall schedule a hearing. All timely requests shall be combined in a single hearing, and the hearing shall be conducted by an Administrative Law Judge. A representative of the AEL shall attend the hearing, which shall be scheduled within 60-days of the end of the 20-day hearing request opportunity. Upon final issuance or denial of a permit for this Tier III application, the ODEQ shall provide public notice of the final permit decision and availability of the response to comments, if any. A written affidavit of all notice publications by the AEL should be submitted to ODEQ within 20-days of the publication.

3.0 GENERAL INFORMATION

Under solid waste disposal permit number 3557021, the AEL is allowed to accept municipal solid waste for disposal, including household waste, commercial solid waste, construction and demolition waste, non-hazardous industrial waste, contaminated soil, sludge, non-friable asbestos, friable asbestos, liquid waste, special waste, and approval from the EPA to accept CERCLA waste in Subtitle D areas of the permit waste footprint. The disposal of any quantity of hazardous, radioactive, regulated untreated infectious biomedical waste, or regulated polychlorinated biphenyl (PCB) waste is prohibited at the AEL. The general information for the facility is provided in the following table.

Table 1. General Information

Facility Name:	American Environmental Landfill
Mailing Address:	207 North 177th W. Ave. Sand Springs, Oklahoma 74063
Physical Location:	207 North 177th W. Ave. Sand Springs, Oklahoma 74063
Facility Owner/Operator:	American Environmental Landfill, Inc.
Facility Phone Number:	(918) 245-7786
Hours of Operation:	Monday-Friday 7:00am-5:00pm, Saturday 7:00am-3:00pm
Primary Contact:	Todd Green

3.1 OATH

OAC 252:515-3-33 requires the applicant to sign the permit application under oath on forms provided by the ODEQ. The signed oath is attached to the cover letter of this application.

3.2 LEGAL DESCRIPTION

The legal description of the AEL permit boundary is as follows: The North ½ of Section 35 and West ½ of Section 36, Township 20 North, Range 10 East, in Osage County, Oklahoma.

3.3 LEGAL RIGHT TO PROPERTY

OAC 252:515-3-34(a)(1) requires that the AEL have a true and correct copy of a legal document filed in Osage County, demonstrating that the applicant possesses a legal right to access and use the property in the manner outlined in this application. Documentation showing that American Environmental Landfill, Inc. owns the property containing the AEL and its proposed expansion area is included as part of the Closure and Post-Closure Plan found in Appendix K of this application.

3.4 ADJACENT PROPERTY OWNER NOTIFICATION

Notification of the proposed landfill expansion was provided to adjacent property owners and copies of the notification letters and delivery confirmations are included in Appendix A.

3.5 AESTHETIC ENHANCEMENT

Due to the site's rural location and the dense vegetation surrounding the site, it is anticipated that the lateral expansion of the AEL will have a minimal effect on aesthetics. The guidelines outlined in the facility's Operations Plan included in Appendix I, should control vectors at the site and keep the AEL aesthetically pleasing.

3.6 AIR QUALITY

The AEL will conform to applicable ambient air quality and source control regulations. The AEL's current permitted capacity is greater than 2.5 million cubic yards as detailed in Section 6.2.1 and is subject to 40 CFR 60, Subpart XXX permitting. AEL operates under Operating Permit No. 2018-1562-TVR2. Odors will be controlled at the site through proper operations and, more specifically, through proper application of daily, intermediate, and final cover. Cover requirements are further discussed in Section 13. Dust and emission control is discussed in the site's Operations Plan included in Appendix I.

3.7 VARIANCE REQUEST

This permit modification includes one variance request in accordance with OAC 252:515-3-32. The variance request is for the location of the permit expansion with an area designated as alluvium or terrace deposits.

OAC 252:515-5-51 (a)(1) states that no area within the permit boundary of a new land disposal facility, or expansion of the permit boundary of an existing land disposal facility, shall be located within an area designated as alluvium or terrace deposits and their recharge areas, as shown on "Map of Aquifers and Recharge Areas in Oklahoma" compiled by Kenneth S. Johnson, Oklahoma Geological Survey (1991). As allowed by O.A.C. 252:515-5-51 (a)(2), Site-specific hydrological and geological data and other information may be submitted to demonstrate clearly and convincingly that the proposed location does not lie in a prohibited area.

Figure 2.5 of Appendix B contains a map showing the permit area on the referenced map is near an area designated as terrace or alluvium deposits. This map indicates there may be a portion of the proposed expansion that overlaps the area identified as terrace deposits on the map. However, as discussed in the Work Plan, previous boring logs from the Phase IV area east of the 203-acre expansion indicate sandstones and shales underlay the expansion site, which are consolidated formations and not terrace deposits. Borings performed for this investigation, only identified a few areas where unconsolidated materials will be beneath the planned expansion excavation and the materials were identified primarily as silty clay or sandy clay. Materials composed of primarily silt or primarily sand, indicative of terrace deposits, were not identified below the planned expansion excavation. However, few borings south of the planned waste boundary encountered material comprised primarily of sand and/or silt indicative of terrace deposits. Figure 3.4 of Appendix B, shows the proposed excavation grades within the waste disposal boundary are within the bedrock that underlies the site. Figure 3.3 of Appendix B shows the proposed excavation grades that are outside the limits of waste and are located in an area proposed for a stormwater detention structure. As detailed in Appendix G, any unstable areas will be undercut to firm material and refilled with suitable compacted earth fill.

By removing unsuitable material and compacting the subgrade in accordance with the QAQC Plan, this design will meet the protection afforded by OAC 252:515-5-51(a).

4.0 LOCATION RESTRICTIONS

All active solid waste disposal facilities are subject to the location restrictions set forth by the ODEQ in OAC 252:515-5. The subchapters of this section show compliance with the location restrictions for solid waste disposal facilities.

4.1 SCENIC RIVERS

No area within the permit boundary of the lateral expansion shall be located within the drainage basin of any river designated by the Oklahoma Scenic Rivers Commission Act. Appendix A contains a map provided by the OWRB showing that the AEL is not located in a drainage basin of any Oklahoma Scenic River.

4.2 RECREATION AND PRESERVATION AREAS

No area within the permit boundary of the lateral expansion shall be located within one-half mile of any area formally dedicated and managed for public recreation or natural preservation by a federal, state, or local government agency. Appendix A contains correspondences from the Oklahoma Archeological Survey dated June 12, 2020, and the Oklahoma Tourism and Recreation Department dated July 7, 2020. A letter was issued to the US Department of the Interior – Bureau of Reclamation dated June 2, 2020. No correspondence with the Bureau of Reclamation was received. Delivery confirmation is included in Appendix A. The letters indicate that the expansion of the AEL will not be within one-half mile of any area formally dedicated and managed for public recreation or national preservation.

4.3 ENDANGERED OR THREATENED SPECIES

For the AEL lateral expansion area, statements from the Oklahoma Department of Wildlife Conservation (ODWC), the United States Fish and Wildlife Service (USFWS), and the Oklahoma Biological Survey (OBS) shall be submitted regarding current information about endangered or threatened wildlife or plant species listed in state and federal laws that exist within one-mile of the expansion area. Appendix A contains correspondences from the USFWS dated February 10, 2020, the ODWC dated April 14, 2020, and the OBS dated February 6, 2020. The letters indicate that it is unlikely for endangered or threatened wildlife or plant species listed in state and federal laws to be located within one-mile of the expansion area and/or stating that the AEL lateral expansion is not likely to adversely affect any threatened or endangered species in the area.

4.4 WETLANDS

No solid waste disposal facility shall be located within wetland areas as designated by the Oklahoma Conservation Commission (OCC) or other appropriate agency. Appendix A includes correspondence that was submitted to the U.S. Army Corps of Engineers and a response dated September 21, 2017, stating that no jurisdictional wetlands were located within the reviewed area. However, the unnamed tributary of the Arkansas River was determined to be a regulated waterway. SCS submitted a Section 404 Individual Permit Application in May 2020 for the relocation of the jurisdictional waters. The U.S. Army Corps of Engineers granted a Section 404 Individual Permit (Permit No. SWT-2017-00339) in a response dated October 30, 2020. The correspondence and Section 404 Individual Permit are included in Appendix A.

4.5 WELLHEAD PROTECTION AREA

Under OAC 252:515-5-32(c), if the lateral expansion area is located within two-miles of a public water supply well, a wellhead protection area shall be identified and submitted to the ODEQ, as specified by the State Wellhead Protection Plan. Appendix A contains a map provided by the OWRB showing that the AEL is not located within two-miles of a public water supply well.

4.6 PUBLIC WATER SUPPLY

No solid waste disposal facilities shall be located within one-mile upgradient of an existing public water supply surface intake, including those permitted for construction, or within a one-year time of travel of a public water supply well. Appendix A contains a map provided by the OWRB showing that the AEL is not located within one-mile upgradient of an existing public water supply surface intake or is it located within a one-year time of travel of a public water supply well.

4.7 100-YEAR FLOODPLAIN

No solid waste disposal facilities shall be located within the 100-year floodplain. Appendix A of this application shows the Flood Insurance Rate Map for Osage County (Map Number 40113C1215K) published by the NFIP and effective on April 2, 2008. According to the map, the proposed expansion is not in or near the floodplain.

4.8 TERRACE DEPOSITS

OAC 252:515-5-51(a)(1) states, “no area within the permit boundary of a new land disposal facility, or expansion of the permit boundary of an existing land disposal facility, shall be located within an area designated as alluvium or terrace deposits and their recharge areas, as shown on "Map of Aquifers and Recharge Areas in Oklahoma" compiled by Kenneth S. Johnson, Oklahoma Geological Survey (1991). However, OAC 252:515-5-51(a)(2) states. “Site-specific hydrological and geological data and other information may be submitted to demonstrate clearly and convincingly that the proposed location does not lie in a prohibited area”. Appendix A contains a map showing the permit area on the referenced map is near an area designated as terrace or alluvium deposits. Results and determinations of the subsurface investigation are provided in Appendix B.

4.9 KARST TERRAIN

Appendix A contains maps provided by the ODEQ GIS Data Server that no karst terrain exists in the vicinity of the proposed expansion area.

4.10 EARTHQUAKE EPICENTER AREA

No solid waste disposal facilities shall be located within five-miles of a known epicenter of an earthquake of more than 4.0 on the Richter Scale, or a number V on the modified Mercalli (MM) scale, as recorded by the Oklahoma Geological Survey. Appendix A contains a map provided by the ODEQ GIS Data Server that no magnitude 4.0 and/or MM V earthquakes have occurred within five-miles of the expansion area.

4.11 FAULT AREAS

No solid waste disposal facilities shall be located within 200-feet of a fault that has had displacement in Holocene time. Appendix A contains a map provided by the ODEQ GIS Data Server

showing that no known Holocene faults have occurred within 200-feet of the lateral expansion area. A topographic map of the area is included as Figure 3.

4.12 SEISMIC IMPACT ZONES

No solid waste disposal facilities shall be located in a seismic impact zone. This restriction may be waived upon successful demonstration that all containment structures, including liners, leachate collection system, and surface water control systems, are designed to resist the maximum horizontal and vertical displacement in lithified earth material for the site. Appendix A contains a map provided by the ODEQ GIS Data Server showing that the site is not located in a seismic impact zone, an area in which it is probable that the maximum horizontal acceleration will exceed .10-.11g in 250 years. Regardless, the Liner and Final Cover System Stability Analysis in Appendix C of this application demonstrates that the containment structures are designed to resist the potential maximum horizontal and vertical displacement.

4.13 UNSTABLE AREAS

No solid waste disposal facilities shall be located over a subsurface mining area or any other unstable area. Appendix A contains correspondence from the Oklahoma Department of Mines, dated July 8, 2020, stating that no known coal, non-coal permits, or any other surface reclamation efforts on record were located near the site location.

4.14 UTILITY/TRANSMISSION LINES

A minimum horizontal separation of 25-feet shall be maintained between disposal areas of land disposal facilities and any aboveground or underground pipeline or transmission line. Information on the locations and owners of all such lines and easements shall be provided to the ODEQ. Appendix A contains a certified mail receipt from a submittal to the Oklahoma Corporation Commission, dated June 2, 2020, but no response was received from the agency.

No utility or transmission line is located within 25-feet of the proposed waste boundary.

4.15 AIRPORTS

No solid waste disposal facilities shall be located within 10,000-feet of any airport runway end used by turbojet aircraft or within 5,000-feet of any airport runway end used by only piston-type aircraft. The Pogue Airport is located East and Northeast of the AEL and is used by turbojet aircraft. Appendix A contains a map showing that the AEL Expansion Area is not located within the 10,000-foot requirement for turbojet aircraft and therefore satisfies the location restriction for airports.

Since the AEL lateral expansion area is located within a 5-mile radius of the Pogue Airport, the airport and the Federal Aviation Administration (FAA) have been notified in writing of the planned expansion in accordance with OAC 252:515-5-52(e)(1). No responses were received. Copies of the certified mail receipts and the letters mailed to the FAA and the Pogue Airport are included in Appendix A.

4.16 BUFFER ZONES

In accordance with OAC 252:515-19-38(b)(2), municipal solid waste landfills incorporating land not permitted for disposal prior to July 1, 1994, shall have a waste-free buffer zone of at least 100-feet in width from the site's property boundary. As shown in the Permit Drawings of this application, the waste boundary of the proposed expansion area is 100-feet away from the property boundary of the AEL.

5.0 SUBSURFACE INVESTIGATION

In accordance with Oklahoma Administrative Code (OAC) 252:515-7, a subsurface investigation of approximately 203-acres was completed between November 2020 and August 2021. The field investigation for determining subsurface soil and groundwater characteristics consisted of drilling 42 exploratory borings, 13 of which were completed as piezometers. The results of the investigation are detailed in the report *Hydrogeologic and Geotechnical Investigation* prepared by SCS Engineers, dated December 2023, is included in this application as Appendix B. Results of the subsurface investigation were considered while designing the lateral expansion area for the AEL.

6.0 LANDFILL DEVELOPMENT

This section, in conjunction with the accompanying drawings and appendices, addresses the various design and operational elements of the AEL lateral expansion.

6.1 DESIGN CRITERIA

The development of the AEL lateral expansion was based on the following design criteria:

- Compliance with Subtitle D requirements
- Final side slopes will be created at a maximum 4:1. The slope of the top of the landfill (crown) will be no less than 4 percent.
- Drainage swales and letdowns will be developed to improve surface water drainage
- Surface water diversionary structures will be capable of handling at a minimum the 25-year 24-hour storm event
- Seismic and stability design criteria established in the Liner and Final Cover Stability Analysis (Appendix C) are to be incorporated into the design

The applicable regulations followed in part or entirely are as follows:

- OAC 252:515
- 40 CFR Part 257 and 258 (Subtitle D)

6.2 LANDFILL DEVELOPMENT

The current landfill has a permit boundary of approximately 222-acres, 150 of which are currently in operation. The proposed landfill lateral expansion area is approximately 203-acres located north and west of the existing permit boundary. Therefore, following approval of a Tier III permit modification, in accordance with Oklahoma Department of Environmental Quality (ODEQ), Oklahoma Administrative Code (OAC) 252:4-7-60, the landfill permit boundary will be comprised of approximately 425-acres.

6.2.1 Capacity Increase

A summary of the capacity increase is listed below.

Table 2. Capacity Increase

Item	Volume
Current Design Capacity	24,175,616 Cubic Yards
Expansion Increased	55,765,504 Cubic Yards
Proposed Capacity	79,941,120 Cubic Yards

6.2.2 Sequence of Development

The landfill will be developed through the construction of phases. The first phase of the lateral expansion to be constructed will be the southern portions of Cell 7. Following the initial construction, the northern portions of Cell 7 will be constructed. The northern portions of the remaining Cells 8 – 10 will be constructed east to west utilizing temporary sumps. The final construction of the southern portions of Cells 8 - 10 will take place west to east and will feature permanent sumps.

Filling should begin at the lowest elevations of each phase and work toward higher elevations to prevent excess leachate generation. Temporary drainage swales and channels should be constructed, as needed, on intermediate contours to control surface water and minimize leachate generation. It should be recognized that the phasing plans are conceptual in nature and may require revision during the operation of the facility.

Under the area fill method, waste is placed next to the previous day's waste until an established row length is reached. Another row is then started parallel to the previously constructed row. As the rows form lifts over each area, the top of each landfill lift should slope in such a manner as to allow surface runoff to drain away from the working face. After a number of rows have been constructed (creating a lift), a second lift is constructed over the first lift. Waste placement will alternate between various lifts of waste and will allow landfill traffic to discharge waste at various levels. This method will allow the earthmoving equipment to stockpile daily cover at the top of the day's waste, if necessary.

The main two criteria used when establishing the sequence of fill are as follows:

- Areas should be small enough to allow organized, controlled development
- Development should be sequenced such that surface water runoff does not flow into the working area

A layer of 6-inches of daily cover or approved alternative daily cover will be placed on the top of waste each day.

The landfill will be developed to provide for long-term stability of the entire landfill. Included in Appendix C is a Liner and Final Cover Stability Analysis for the AEL. This analysis confirms the landfill is stable under active, intermediate, and final development of the landfill. The design of the expansion area, particularly the base grades and cap components, are based on meeting a factor of safety requirements and site-specific conditions.

7.0 GROUNDWATER MONITORING

A detailed hydrogeologic and geotechnical investigation has been conducted at this site. The report for this investigation entitled, *Hydrogeologic and Geotechnical Investigation,* is included in Appendix B. Results of this subsurface investigation were used in selecting locations for groundwater monitoring detection wells. A Groundwater Monitoring Plan has been included with this application in Appendix D. The Groundwater Monitoring Plan is intended to be used as a standalone document, a copy of which will be maintained within the facility's operating record. The Groundwater Monitoring Plan contains pertinent information for existing and proposed detection wells and piezometers, as well as schedules and proper sampling and statistical analysis procedures to complete groundwater monitoring events.

8.0 EXPLOSIVE GAS MONITORING

The decomposition of encapsulated solid waste within a landfill is known to produce landfill gas, typically consisting of approximately 50% methane (CH_4) and 50% carbon dioxide (CO_2). Trace amounts of non-methane organic compounds (NMOCs), oxygen, hydrogen sulfide, and reactive organic gases are also present (*Engineering and Design Landfill Off-Gas Collection and Treatment Systems*, U.S. Army Corps of Engineers, 1995).

Per OAC 252:515-15-2, the concentration of methane gas generated by the facility shall not exceed twenty-five percent (25%) of the lower explosive limit (LEL) for methane in all structures within the permit boundary or exceed the LEL for methane at the permit boundary. The LEL is defined as the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25°C and atmospheric pressure. The LEL for methane is 5% by volume in air.

OAC 252:515-15-3(a) requires an Explosive Gas Monitoring Plan to be submitted and approved by the ODEQ to demonstrate how compliance with the LEL listed in OAC 252:515-15-2 will be achieved. A copy of the Explosive Gas Monitoring Plan is included with this application as Appendix E. The Explosive Gas Monitoring Plan is intended to be used as a standalone document, a copy of which will be maintained within the facility's operating record.

9.0 STORMWATER MANAGEMENT

9.1 OKR05 PERMIT REQUIREMENTS

State law requires an Oklahoma Pollutant Discharge Elimination System (OPDES) Permit be obtained to allow stormwater to discharge from this facility. Under state regulations, the AEL is subject to requirements of the ODEQ Department of Water Quality Division Sector L Industrial General Permit OKR05 (OKR05). Under the requirements of OKR05, the facility is to prepare and maintain a Stormwater Pollution Prevention Plan (SWP3). The SWP3 describes the AEL and its operations, identifies potential sources of stormwater pollution at the facility, recommends appropriate Best Management Practices (BMPs) or pollution control measures to reduce the discharge of pollutants in stormwater runoff, and provides procedures for regular inspections, stormwater monitoring, recordkeeping and reporting, and periodic review of the SWP3.

The SWP3 for the facility is maintained at the AEL. As shown in the Permit Drawings, the proposed permit modification will alter surface water drainage and outfall locations from their present locations. As stormwater confluence is altered at the facility, the site's SWP3 shall be amended accordingly.

9.2 RUN-ON CONTROL SYSTEMS

In accordance with OAC 252:515-17-2(1), the AEL has been designed to have a run-on control system to prevent flow onto active portions of the facility during the peak discharge from a 24-hour, 25-year storm event. The Permit Drawings show the design for a temporary separation berm. The temporary separation berms will be constructed, as needed, between phases as the landfill is expanded. Additional run-on control features such as diversion berms will be constructed upgradient of the construction areas and active portions of the landfill.

9.3 RUN-OFF CONTROL SYSTEMS

The peak volume and flow were calculated using the SCS TR-55 Hydrology Method and the SCS TR-55 Time of Concentration Method associated with Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2020. The flows for each surface water structure were determined to show that the run-off controls are adequately sized to handle a 24-hour, 25-year single storm event. Surface water model results and calculations are included in the Stormwater Design System Report included as Appendix F.

The following surface water management structures will be constructed to control surface water flow:

- Drainage swales
- Letdown channels
- Perimeter channels
- Stormwater Detention Structures

9.3.1 Drainage Swales

The drainage swales are V-shaped, with 4:1 uphill side slope and 2:1 downhill side slope. The drainage swales have a height of 3.5-feet and will be sloped at approximately 1.0 percent towards the letdown channels on side slopes, as shown in the Permit Drawings. Design calculations for drainage swales can be found in Appendix F.

9.3.2 Letdown Channels

The drainage area for the letdown channel was determined based on channel and sheet flow from each sub-basin draining to the letdown channel. A peak flow was determined by utilizing a time of concentration for the worst-case point (i.e., the point within the drainage area located furthest away from the letdown) and applying that time of concentration to the entire area. Thus, a conservative design is achieved. Calculations for the letdown channel are shown in the Surface Water System Design Report located in Appendix F.

The letdown is trapezoidal shaped with 2:1 side slope, a bottom width of 8-feet, and a depth of 2-feet. The letdown channels are sloped at approximately 25 percent towards the perimeter drainage channels. Alternate materials may be used to line the letdown channel such as HDPE, Rip-Rap, manufactured erosion controls, etc., but must be approved by ODEQ prior to installation.

9.3.3 Perimeter Drainage Channels

The perimeter drainage channels will vary in dimension but generally will be vegetated channels or lined with rip-rap, 3-feet to 3.5-feet deep with a bottom width of 0-feet to 10-feet and 3:1 side slope. The channels will be sloped toward a discharge point at an approximate average slope of 1 to 6 percent. Design calculations for perimeter ditches can be found in the Surface Water System Design Report in Appendix F.

9.3.4 Detention Structures

There are two stormwater detention structures proposed for the AEL. A North Stormwater Detention Structure and a South Stormwater Detention Structure are proposed to allow for the discharge of stormwater to impaired waterbodies. These stormwater detention structures allow for a settling period, to achieve the quality of stormwater as set by the 2022 OKR05 General Permit, by discharging stormwater through a perforated riser. The stormwater detention structures are designed to discharge typical stormwater events (25-year, 24-hour storm event) through a perforated riser. Secondary discharge structures associated with the stormwater detention structures were designed to discharge stormwater from a 100-year, 24-hour storm event while maintaining minimum freeboard requirements. Design calculations for the stormwater detention structures can be found in the Surface Water System Design Report in Appendix F.

10.0 LINER CONSTRUCTION

A composite liner system will be constructed to protect groundwater quality. The composite liner system will maintain a minimum 5-foot vertical separation between the highest groundwater elevation and the lowermost surface on which waste will be placed, conform to specifications included in OAC 252:515-11, and consist of the following layers from bottom to top:

- Compacted subgrade
- 24-inches of compacted soil liner (less than or equal to $1x10^{-7}$ centimeters per second (cm/sec) hydraulic conductivity)
- 60-mil high-density polyethylene (HDPE) smooth or double-sided textured geomembrane liner
- 8 oz/sy non-woven geotextile fabric cushion layer
- 24-inches of granular drainage/protective cover material (greater than or equal to $1x10^{-3}$ cm/sec hydraulic conductivity)

Where fill is necessary to achieve subgrade elevations, the subgrade component of the liner will be placed in uniform lifts that do not exceed 9-inches in loose thickness and are compacted to at least 95 percent of standard Proctor (ASTM D 698) at a moisture content ranging from one percentage point below optimum to three percentage points above optimum. The top 6-inches of compacted fill material underlying the soil liner will have a maximum particle size of 2-inch diameter. Where excavation is necessary to achieve subgrade elevations, the upper 6 inches of soil subgrade will be recompacted and graded to provide a relatively smooth workable surface on which to construct the compacted soil liner component.

The compacted soil liner will be constructed by placing uniform lifts that do not exceed 9-inches in loose thickness to produce compacted lifts of approximately 6-inches. The soil liner will be compacted to a moisture content and density condition consistent with that necessary to produce a competent liner with a hydraulic conductivity less than or equal to 1×10^{-7} cm/sec. The appropriate moisture content and density condition will be determined prior to construction for each type of material to be used.

Generally, densities greater than 95 percent of Standard Proctor maximum dry density and moisture contents exceeding the optimum moisture content are necessary to achieve a hydraulic conductivity of less than or equal to 1×10^{-7} cm/sec. Compaction will be completed utilizing an appropriately heavy, properly ballasted, penetrating-foot compactor (such as a CAT 815 or equivalent). Dozer or scraper equipment will not be used for primary compaction efforts. One of the goals of compaction is to allow thorough remolding of the clay by kneading action. Following construction, the compacted soil liner will be protected from desiccation or freeze/thaw cycles by geosynthetics and protective cover materials as necessary.

The soils used in the construction of the compacted soil liner will meet the following minimum specifications:

- Contain less than or equal to 20 percent gravel (dry-weight percentage retained on the No. 4 sieve)
- Allow more than 30 percent passage through a Number 200 Sieve
- Have a liquid limit greater than or equal to 24 percent
- Have a plasticity index greater than or equal to 10 percent
- Particle size shall be less than 1-inch diameter
- After the soil is compacted, the water content of the soil shall be equal to or greater than optimum
- After the soil is compacted, the minimum density of the soil shall be greater than or equal to 95 percent of the standard proctor density (ASTM D698) or 90 percent of the modified proctor density (ASTM D1557)

The geomembrane will be installed in accordance with the manufacturer's recommendation for a facility of this type. A geotextile cushion layer will then be placed in accordance with manufacturer's recommendations to protect the geomembrane from the overlying granular leachate collection layer.

Specific information pertaining to quality assurance and quality control during construction of the liner system is included in the Quality Assurance / Quality Control (QA/QC) Plan for Liner and Leachate Collection System Installation and Testing, which is included with this application in Appendix G. The QA/QC Plan is intended to be used as a standalone document, a copy of which will be maintained within the facility's operating record.

Appendix C includes liner stability calculations. These calculations confirm the stability of the liner system for the proposed design.

11.0 LEACHATE COLLECTION AND MANAGEMENT

SCS Engineers utilized the Hydrologic Evaluation of Landfill Performance (HELP) model, Version 4.0 Beta (2018) for the design of the leachate collection system (LCS). The following criteria apply:

- Minimum slope along the leachate pipe is 0.5 percent
- Minimum slope to the leachate pipe is 0.5 percent
- Twelve inches or less of head must be maintained on the liner during all phases (active, interim, and closed). To accomplish this, a drainage media will be used and will have a minimum hydraulic conductivity of 1.0×10^{-3} cm/sec.

The LCS, designed to collect and remove leachate from the landfill and reduce the potential leachate head on the liner system, has been included in the design of the expansion. This system has been designed in accordance with OAC 252:515-13 to effectively manage leachate for both the operating life of the landfill and the 30-year post-closure period. Specifically, the system has been designed to function without clogging through the scheduled operating life, closure, and post-closure of the landfill. In general, the LCS will use gravity drainage from the existing landfill as well as in the expansion area to drain to the sumps at the perimeter of the landfill.

The LCS will consist of the following:

- Collection pipe network
- 8-oz/sy non-woven geotextile
- 24-inches of granular material
- Leachate collection sumps
- Associated leachate pumping systems
- Leachate evaporation pond

An 8-oz/sy non-woven geotextile will be placed directly on top of the 60-mil HDPE geomembrane liner prior to placement of the granular material for cushioning purposes. The effectiveness of the LCS has been evaluated using the Hydrologic Evaluation of Landfill Performance (HELP) model, Version 4.0. Design details of the landfill and weather data for the Sand Springs, Oklahoma area were used to determine leachate volumes produced during the life of the landfill as well as the maximum hydraulic head created on the liner system.

The HELP model was run for three operating scenarios to model the landfill at various stages of its development (active, interim, and closed). The table below summarizes the modeling scenarios.

Table 3. HELP Model Scenarios

ACTIVE – 20-FEET OF MSW IN PLACE
INTERIM – 120-FEET OF MSW IN PLACE
CLOSED – 397-FEET OF MSW IN PLACE

Modeling indicated that the design will not result in a leachate head greater than 12-inches on the liner system for each scenario as required by OAC 252:515-13-31(b)(1). HELP model results are located in Appendix H.

HELP modeling was completed on a "1-acre" basis to allow for leachate generation quantities to be applied to various operating stages of the landfill. Specifically, active, interim, and closed leachate generation quantities were applied to the estimated acreage of active, interim, and closed conditions, respectively, to estimate leachate volumes at different stages of landfill development. A summary of leachate generation quantities is included in Appendix H.

11.1 LEACHATE DRAINAGE LAYER

A leachate drainage layer is necessary above the liner to drain leachate away from the waste to the leachate collection sumps. The leachate drainage layer will consist of a minimum of 12-inches of granular material placed on top of the bottom liner system. Prior to placement of the granular material, an 8-oz/sy non-woven geotextile cushion will be placed directly on top of the geomembrane liner to cushion and protect the geomembrane liner from the overlying granular leachate collection material. The granular material should be clean, with a minimum hydraulic conductivity of $1x10^{-3}$ cm/sec.

Aggregate placement/spreading techniques that minimize the potential for damage to the underlying geomembrane liner shall be used. Specifically, the granular material will be placed by advancing the aggregate in fingers across the underlying geotextile and geomembrane liner. Low-ground pressure equipment, such as a light-weight, wide-tracked dozer, will be used for spreading the aggregate. A 12-inch granular protective cover layer will be placed on top of the 12-inch leachate collection layer. The 12-inch granular leachate collection layer and 12-inch protective layer will likely consist of the same material and be installed in conjunction.

Specific information pertaining to quality assurance and quality control during construction of the leachate collection system is included in the Quality Assurance / Quality Control (QA/QC) Plan for Liner and Leachate Collection System Installation and Testing, which is included with this application in Appendix G. The QA/QC Plan is intended to be used as a standalone document, a copy of which will be maintained within the facility's operating record.

11.2 LEACHATE COLLECTION PIPE NETWORK

In the expansion area, perforated, 6-inch HDPE SDR 7.3 leachate collection pipes will be strategically placed on top of the geosynthetic liner and geotextile within the granular drainage material to direct leachate flow to the collection sump. The collection pipes are located to minimize the distance that leachate will flow through the drainage layer prior to intercepting a collection pipe. The collection pipes are sloped at a minimum of 0.5 percent toward leachate collection sumps located along the Southern berm of the landfill.

The 6-inch collection pipes will be constructed of HDPE material with a Standard Dimension Ratio (SDR) of 7.3 or equivalent. Pipe perforations will consist of three rows of 0.5-inch diameter holes drilled at a 60-degree angle from vertical on the bottom of each side of the pipe. Holes will be spaced in 4-inch increments. The collection pipes will be bedded in granular material and protected by a geotextile to serve as a filtering mechanism to keep silt and other fines from clogging the pipes. Per OAC 252:515-13-34, the leachate collection pipes shall be cleaned out after placement of protective cover layer, again after the placement of the first lift of waste, and once per year thereafter.

Design calculations were completed to evaluate the structural strength imposed by the overlying waste and potential equipment loads (see Appendix H for calculations). Typical details for collection pipes, pipe perforations, and surrounding granular material are shown in the Permit Drawings.

11.3 LEACHATE COLLECTION SUMPS

Four leachate collection sumps are proposed. The sumps will provide collection points from which leachate can be removed from the landfill. Leachate will drain into the sumps through collection pipes directly from the drainage layer. The sumps will be located on the South side of the expansion area and will have dimensions of approximately 24-feet by 24-feet by 2-feet deep. The sumps will be filled with clean, non-carbonate drainage stone to an elevation even with the surrounding granular material layer.

11.4 LEACHATE PUMPING SYSTEM

Leachate will be removed from the sumps using submersible pumps or above-ground pumps. One, 18-inch diameter perforated PVC or HDPE pipe, holding submersible pumps, will be buried in the sump to access the leachate. The 18-inch HDPE SDR 11 or PVC Schedule 80 perforated pipes will exit the sump as a solid pipe and follow the 3:1 side slope to the top of the landfill composite liner system, where it can be accessed outside of the landfill footprint. This access point will allow pumps and associated hoses and cables to be lowered into the sump and removed, as needed, for maintenance or replacement. The leachate collection system will be equipped with a system for automatic and continuous removal of leachate not requiring intervention by the owner/operator. Leachate levels will be monitored with a pressure transducer and level readout at the surface. The system will also be equipped with a high-level alarm to inform site personnel when the leachate head on the liner exceeds 12-inches.

11.5 LEACHATE STORAGE AND DISPOSAL

Leachate generated within existing Phase IV A-N collects and is pumped to the existing leachate storage impoundments located East and West of existing landfill.

Leachate collected in the proposed expansion area, Cells 7-10, will be pumped up the side slope to a dual-contained force main and transported via the dual-contained force main to the proposed leachate storage impoundment. The proposed leachate storage impoundment will be constructed in accordance with the Quality Assurance/Quality Control Plan for Liner and Leachate Collection System Installation and Testing. A composite liner system will be constructed to protect groundwater quality. The composite liner system will conform to specifications included in OAC 252:515-11 and consist of the following layers from bottom to top:

- Compacted subgrade
- 24-inches of compacted soil liner (less than or equal to $1x10^{-7}$ centimeters per second (cm/sec) hydraulic conductivity)
- 60-mil high-density polyethylene (HDPE) smooth on floor and double-sided textured geomembrane liner on slope

The HELP model calculated the highest daily leachate drainage collected rate which occurred during peak interim conditions and is equal to 5.98 gallons/acre/day. Based upon the approximate 163-acres of proposed cell development within Cells 7-10, the estimated annual drainage collected is 355,780 gallons/year. The design capacity considers the two existing leachate storage impoundments located East and West of the existing landfill. The existing leachate storage capacity is 12,131,166-gallons and 6,550,018-gallons respectively. Therefore, the proposed leachate storage impoundment will maintain a minimum 3-feet of freeboard with a design capacity of 19,155,653-gallons.

Leachate stored in the leachate storage impoundments will be recirculated in accordance with their approved plan. A Leachate Recirculation Plan is included as Appendix M.

12.0 SITE OPERATIONS

In accordance with OAC 252:515-19, an Operations Plan has been prepared and is included with this application in Appendix I. The Operations Plan is intended to be used as a standalone document, a copy of which will be maintained within the facility's operating record. The Operations Plan provides pertinent operational methods and procedures to provide public access control, control litter, control emissions, control disease vectors, place waste, and measure and report incoming waste. The Operations Plan outlines acceptable waste streams, limitations on incoming waste streams, as well as recordkeeping and reporting requirements for the AEL.

Acceptable and prohibited wastes for the AEL are outlined in depth in the Waste Exclusion Plan, included with this application in Appendix J. The Waste Exclusion Plan is intended to be used as a standalone document, a copy of which is maintained within the facility's operating record. The Waste Exclusion Plan also provides information on restrictions for the disposal of bulk liquids, restrictions on the disposal of municipal sewages, as well as recordkeeping and reporting requirements for incoming waste streams.

This permit application includes a Salvage and Recycling Plan. The plan is part of the site's Operations Plan, included as Appendix I. The recycling/salvage operation at the AEL will be conducted as outlined in the Operations Plan.

13.0 COVER AND SOIL BORROW REQUIREMENTS

Cover will be applied to reduce fire hazards, infiltration, odors, and blowing litter; to control gas venting and vectors; to discourage scavenging; and to provide a pleasing appearance.

13.1 DAILY AND INTERMEDIATE COVER

Daily soil cover or an alternative daily cover will be applied at the end of each operating day, regardless of weather, as required by ODEQ, to deter disease vectors, fires, odors, and blowing litter. The daily soil cover material should consist of nominally compacted earthen material free of garbage, trash, or other unsuitable material. The minimum thickness of the daily soil cover will be 6-inches.

Intermediate cover will consist of at least 12-inches of nominally compacted soil over refuse. Proper surface grades and side slopes will be maintained to promote runoff and minimize infiltration without excessive erosion. Internal side slopes will not exceed a slope of 3:1 and external side slopes will not exceed a slope of 4:1. The final top of slope will be graded to a minimum of 4 percent.

13.2 FINAL COVER SYSTEM

The final cover system will be constructed once the landfill reaches final grade. The AEL is permitted to use an alternate evapotranspiration final cover system. The cover system conforms to ODEQ specifications and includes the following components from bottom to top:

- 12-inches of intermediate cover soil
- 24-inches of vegetation support soil
- 12-inches of vegetation topsoil

Once the cover system and surface water control structures are constructed as prescribed, the vegetative soil layer will be fertilized, seeded, and mulched to develop a thick stand of vegetation.

Each layer of this final cover system will be supportive of vegetative growth. The soils that make up the vegetative topsoil layer will be tested for proper application of lime, fertilizer, or other soil conditioning amendments. Once the proper amendments have been disked into the soil, seeding of a hardy grass mixture such as fescue and clover will take place. At the conclusion of seeding, the vegetative layer will be mulched to prevent soil erosion and assist with soil moisture retention and seed germination. The vegetative crop will be cared for (e.g., irrigated, reseeded, etc.) to establish a healthy stand of grass as quickly as possible. Both the crown and side slopes of the completed portions of the landfill will be seeded in the fall or early spring. The vegetative soil cover will be tested to determine the lime and fertilizer rates as needed.

13.3 BORROW SOURCES

The active borrow area for the site is located North and West of the existing landfill in the proposed expansion area. Based on proposed base and final grades for the expansion area, it is estimated that approximately 17,710,976 CY of soil will need to be excavated and 428,782 CY of soil will need to be filled in the expansion area to achieve top-of-subgrade elevations.

13.4 BORROW AREA RECLAMATION

The borrow areas should have a gently sloping topography which provides wet weather drainage. The borrow areas will be excavated in a manner that results in final contours similar to those present before disturbance, except the area will have a lower elevation. A minimum of approximately 12-inches of unconsolidated material will be left in place. The area will be excavated in a manner to provide positive drainage and possibly create one or more impoundments. In the case that impoundments are proposed or constructed, all applicable permits will be obtained and copies provided to the ODEQ. Activities will be scheduled to minimize erosion and sedimentation. Disturbance of vegetation will be limited to the extent possible. Attempts will be made to save trees where practicable. The borrow areas will be regraded in a manner to provide sufficient soil material for the re-establishment of vegetation. Revegetation activities should be scheduled for spring and fall.

14.0 CLOSURE AND POST-CLOSURE

A Closure and Post-Closure (CPC) Plan is included in Appendix K. The CPC Plan is in general accordance with OAC 252:515-25. The CPC Plan is intended to be used as a standalone document, a copy of which will be maintained within the facility's operating record. The CPC Plan includes the necessary actions to be completed at the site before the facility can be certified closed and sets forth the maintenance and monitoring requirements during the post-closure period. The post-closure period will be in effect for 30 years. The closed landfill facility will be maintained in order to retain its integrity and will not pose a threat to human health or the environment. The CPC Plan also addresses cost estimates and financial assurance requirements for the AEL.

15.0 GENERAL COMMENTS

This permit application is based on the available information as provided by SCS Engineers. If, upon further evaluation or during construction, inconsistencies become apparent, re-evaluation of this report will be necessary.

This report has been prepared for the exclusive use of the AEL and American Environmental Landfill, Inc. for the specific application to the project discussed and has been prepared in accordance with generally accepted engineering practices. No warranties, expressed or implied, are intended or made. In the event of any changes in the nature, design, or location of the project as outlined in this report, this report shall not be considered valid, unless the changes are reviewed and this report modified or verified in writing by the engineer.

Permit Drawings

Appendix A

Adjacent Property Owner Notifications, Location Restriction Correspondences, and Figures

Appendix A

Adjacent Property & Mineral Right Owner Notification

Certified Mail Receipts

Location Restriction Summary Table

Location Restriction Correspondence Letters

Adjacent Property Owner Notification

May 14, 2024
File No. 27220345.00

See addresses attached.

Subject: **American Environmental Landfill**
Proposed Landfill Expansion Notification
ODEQ Permit No.: 3557021

As required by the Oklahoma Department of Environmental Quality, SCS Engineers is submitting this notification associated with the proposed expansion of the American Environmental Landfill, which is owned and operated by American Environmental Landfill, Inc. As an adjacent property owner, Oklahoma law requires you to be notified of the application filing. The proposed landfill expansion consists of approximately 203 acres and is located on North 177th Ave, 5.5 miles West of Sand Springs. The expansion is more accurately described as the North ½ of Section 35 and West ½ of Section 36, Township 20 North, Range 10 East, in Osage County, Oklahoma.

If you have any questions or comments, please do not hesitate to contact the undersigned at (405) 246-1574. Thank you for your time and effort in this matter.

Sincerely,

Trevar Lytle, P.E.
Senior Project Professional
SCS Engineers

Wade J. Miller
Project Director
SCS Engineers

cc: Mr. Todd Green – American Environmental Landfill

Certified Mail Receipients

Adjacent Property Owners to Americal Envionmental Landfill					
Map ID	**Name**	**Street Address**	**City**	**State**	**Zip**
1	David and Nadine Hardy	1285 W Anderson Rd	Sand Springs	OK	74063
2	David Hunter and Frances Hawkins	52 N 194th W Ave	Sand Springs	OK	74063
3	James and Christine King	1317 Anderson Rd	Sand Springs	OK	74063
4	Jason and Karen Kearns	42 N Sunset Ave	Sand Springs	OK	74063
5	Jerry and Peggy Easter	PO Box 384	Sand Springs	OK	74603
6	John and Laura Bright	43 N Sunset Ave	Sand Springs	OK	74063
7	Karen Wilder	1157 Andreson Rd	Sand Springs	OK	74063
8	LPU Group Investments	8215 S Mingo Rd, #150	Tulsa	OK	74133
9	Lynn Ingram and Nancy Delwater	1100 N 197th W Place	Sand Springs	OK	74063
10	Michael and Teina Burns	818 Anderson Rd	Sand Springs	OK	74063
11	Michael Lobsinger and Brandee Harris	2301 N 193rd W Ave	Sand Springs	OK	74063
12	Paul and Holly Shreffler	86 N Sunset Ave	Sand Springs	OK	74063
13	Robert and Virginia Humphrey	1625 Anderson Rd	Sand Springs	OK	74063
14	Salvador and Belen Ruiz	19 Eagle Drive	Sand Springs	OK	74063
15	Sand Springs Home	PO Box 278	Sand Springs	OK	74063
16	Stanley and Barbara Gomez	201 W First St	Sand Springs	OK	74063
17	Stephen and Chaleah Lane	29 N 194th W Ave	Sand Springs	OK	74063
18	Forrest Burns Trust	466 N 177 W Ave	Sand Springs	OK	74063
19	Shell Creek Game Farms, LLC.	466 N 177 W Ave	Sand Springs	OK	74063

Mineral Right Owner Notification

December 12, 2024
File No. 27220345.00

Osage Nation
P.O. Box 807
Pawhuska, OK 74056

Subject: **American Environmental Landfill**
Proposed Landfill Expansion Notification
ODEQ Permit No.: 3557021

As required by the Oklahoma Department of Environmental Quality, SCS Engineers is submitting this notification associated with the proposed expansion of the American Environmental Landfill, which is owned and operated by American Environmental Landfill, Inc. As the Mineral Interest Owner, Oklahoma law requires you to be notified of the application filing. The proposed landfill expansion consists of approximately 203 acres and is located on North 177th Ave, 5.5 miles West of Sand Springs. The expansion is more accurately described as the North ½ of Section 35 and West ½ of Section 36, Township 20 North, Range 10 East, in Osage County, Oklahoma.

If you have any questions or comments, please do not hesitate to contact the undersigned at (405) 246-1574. Thank you for your time and effort in this matter.

Sincerely,

Trevar Lytle, P.E.
Senior Project Professional
SCS Engineers

Wade J. Miller
Project Director
SCS Engineers

cc: Mr. Todd Green – American Environmental Landfill

Certified Mail Receipts

U.S. Postal Service™
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Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Sand Springs, OK 74063

Certified Mail Fee $4.40

Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $0.00
- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
MAY 14 2024
05/14/2024

7020 0640 0000 9699 6053

David Hunter and Frances Hawkins
52 North 194th W. Ave.
Sand Springs, OK 74063

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- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
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7022 0410 0002 7224 4106

James and Christine King
1317 Anderson Rd.
Sand Springs, OK 74063

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- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
05/14/2024

7022 0410 0002 7224 4304

David and Nadine Hardy
1285 W Anderson Rd.
Sand Springs, OK 74063

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Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $0.00
- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

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7022 0410 0002 7224 4120

Jerry and Peggy Easter
PO Box 384
Sand Springs, OK 74063

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- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
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7022 0410 0002 7224 4298

Stanley and Barbara Gomez
201 W First St
Sand Springs, OK 74063

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Certified Mail Fee	$4.40
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

Postmark Here
MAY 14 2024
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USPS

7022 0410 0002 7224 4168

Lynn Ingram and Nancy Delwater
1100 N 197th W. Place
Sand Springs, OK 740663

for Instructions

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☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

Postmark Here
MAY 14 2024
05/14/2024
USPS

7022 0410 0002 7224 4144

Karen Wilder
1156 Anderson Rd
Sand Springs, OK 74063

for Instructions

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☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

Postmark Here
MAY 14 2024
05/14/2024
USPS

7022 0410 0002 7224 4151

John and Laura Bright
43 N Sunset Ave
Sand Springs, OK 74063

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☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

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05/14/2024
USPS

7022 0410 0002 7224 4175

Michael and Teina Burns
818 Anderson Rd
Sand Springs, OK 74063

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☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

Postmark Here
MAY 14 2024
05/14/2024
USPS

7022 0410 0002 7224 4182

Michael Lobsinger and Brandee Harris
2301 N 193rd W. Ave
Sand Springs, OK 74063

for Instructions

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☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

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7022 0410 0002 7224 4113

Jason and Karen Kearns
42 N Sunset Ave
Sand Springs, OK 74063

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- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4229

Sand Springs Home
PO Box 278
Sand Springs, OK 74063

for Instructions

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Sand Springs, OK 74063

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Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $0.00
- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4199

Paul and Holly Shreffler
86 N Sunset Ave
Sand Springs, OK 74063

for Instructions

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Sand Springs, OK 74063

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Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $0.00
- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4205

Robert and Virgina Humphrey
1625 Anderson Rd
Sand Springs, OK 74063

for Instructions

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Extra Services & Fees (check box, add fee as appropriate)
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- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4212

Salvador and Belen Ruiz
19 Eagle Drive
Sand Springs, OK 74063

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- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4236

Stephen and Chaleah Lane
29 N 194th W. Ave
Sand Springs, OK 74063

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Tulsa, OK 74063

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Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $0.00
- Return Receipt (electronic) $0.00
- Certified Mail Restricted Delivery $0.00
- Adult Signature Required $0.00
- Adult Signature Restricted Delivery $

Postage $0.68

Total Postage and Fees $8.73

Postmark Here
0538 25
SPRINGBRIDGE BRANCH SM KS 66212
MAY 14 2024
05/14/2024

7022 0410 0002 7224 4151

LPU Group Investments, LLC
8215 S Mingo Rd #150
Tulsa, OK 74133

for Instructions

9589 0710 5270 0407 3550 76

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Sand Springs, OK 74063

OFFICIAL USE

Certified Mail Fee	$4.85
$	$4.10
Extra Services & Fees *(check box, add fee as appropriate)*	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.73
$	
Total Postage and Fees	$9.68
$	

0539 04

Postmark Here

JUL 24 2024

07/24/2024

USPS

Shell Creek Game Farms, LLC
466 N 177 West Ave
Sand Springs, OK 74063

for Instructions

9589 0710 5270 0407 3550 69

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$	$4.10
Extra Services & Fees *(check box, add fee as appropriate)*	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.73
$	
Total Postage and Fees	$9.68
$	

0539 04

Postmark Here

2 4 2024

07/24/2024

USPS

Forrest Burns Trust
466 N 177 West Ave
Sand Springs, OK 74063

se for Instructions

27226845.00T-1
$17.00

UNITED STATES POSTAL SERVICE.

BLUE VALLEY
12433 ANTIOCH RD
OVERLAND PARK, KS 66213-9998
(800)275-8777

12/12/2024 12:12 PM

Product	Qty	Unit Price	Price
First-Class Mail® Letter	1		$0.73
Pawhuska, OK 74056			
Weight: 0 lb 0.50 oz			
Estimated Delivery Date			
Mon 12/16/2024			
Certified Mail®			$4.85
Tracking #:			
9589 0710 5270 0407 3551 06			
Return Receipt			$4.10
Tracking #:			
9590 9402 8817 4005 4753 57			
Total			$9.68

Grand Total: $9.68

Credit Card Remit $9.68
Card Name: MasterCard
Account #: XXXXXXXXXXXX7944
Approval #: 053998
Transaction #: 402
AID: A0000000041010
AL: MASTERCARD Chip
PIN: Not Required

U.S. Postal Service™
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For delivery information, visit our website at *www.usps.com®*.
Pawhuska, OK 74056

OFFICIAL USE

Certified Mail Fee	$4.85	0539 04
Extra Services & Fees (check box, add fee as appropriate)	$4.10	
☐ Return Receipt (hardcopy)	$0.00	
☐ Return Receipt (electronic)	$0.00	Postmark Here
☐ Certified Mail Restricted Delivery	$0.00	
☐ Adult Signature Required	$0.00	
☐ Adult Signature Restricted Delivery	$	
Postage	$0.73	
Total Postage and Fees	$9.68	12/12/2024
Sent To	Osage Nation	
Street and Apt. No., or PO Box No.	PO Box 807	
City, State, ZIP+4®	Pawhuska, OK 74056	

9589 0710 5270 0407 3551 06

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

[redacted]d and [redacted]adine Hardy
[redacted]W Anderson Rd.
Sa[redacted] Springs, OK 74063

9590 9402 7313 2028 7061 46

2. Article Number *(Transfer from service label)*
022 0410 0002 7224 4304

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Dave Hardy ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Dave Hardy C. Date of Delivery 5-24-24

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

LPU Grou[redacted]vestments, LLC
8215 S Mi[redacted] Rd #15[redacted]
Tulsa, OK 74133

9590 9402 7313 2028 7062 14

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4151

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Danielle Coleman ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Danielle Coleman C. Date of Delivery 5/20/24

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 [redacted]turn Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

J[redacted]and Karen Kearns
42[redacted]Sunset Ave
Sa[redacted]Springs, OK 74063

9590 9402 7313 2028 7061 77

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4113

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [redacted] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Michae[redacted]d Teina Burns
818 An[redacted]rson Rd
Sand S[redacted]ngs, OK 74063

9590 9402 7313 2028 7062 38

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4175

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [redacted] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Michael Burns C. Date of Delivery 5-16-202[redacted]

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☑ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Karen [redacted]
1156 A[redacted]erson Rd
Sand Springs, OK 74063

9590 9402 7313 2028 7062 07

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4144

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Karen Wilder ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Karen Wilder
C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail [redacted]
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

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- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Sand [redacted]ings Home
PO Box 278
Sand Springs, OK 74063

9590 9402 7313 2028 7063 06

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4229

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Corrie Luker ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Corrie Luker
C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

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- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Jerry an[redacted]ggy Easter
PO Box 384
Sand Springs, OK 74063

9590 9402 7313 2028 7061 84

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4120

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Jerry Easter ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Jerry Easter
C. Date of Delivery 5-21-24

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

James [redacted]nd Christine King
1317 Anderson Rd.
Sand Springs, OK 74063

9590 9402 7313 2028 7061 60

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4106

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X James King ☐ Agent ☐ Addressee

B. Received by *(Printed Name)*
C. Date of Delivery 5/18/24

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Lyn[illegible]ngram and Nancy Delwater
11[illegible] N 197th W. Place
S[illegible] Springs, OK 740663

9590 9402 7313 2028 7062 21

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4168

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Nancy Ingram ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ro[illegible] and Virgina Humphrey
162[illegible] Anderson Rd
Sand S[illegible]gs, OK 74063

9590 9402 7313 2028 7062 69

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4205

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Paul and Holly Shreffler
186 N Sunset Ave
Sand Springs, OK 74063

9590 9402 7313 2028 7062 52

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4199

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Holly Shreffler ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Holly Shreffler | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Stanley and Barbara Gomez
20[illegible] First St
Sand Springs, OK 74063

9590 9402 7313 2028 7061 39

2. Article Number *(Transfer from service label)*
7022 0410 0002 7224 4298

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Justin Burr | C. Date of Delivery 5/20/24

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

F[illegible] Burns Trust
4[illegible]77 West Ave
Sand[illegible]Springs, OK 74063

9590 9402 8817 4005 4754 18

2. Article Number *(Transfer from service label)*

1589 0710 5270 0407 3550 69

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X Emmitt Burns ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

JUL 30 2024

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

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- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Stone Creek Game Farms, LLC
[illegible] N 177 West Ave
[illegible]ings, OK 74063

9590 9402 8817 4005 4754 01

2. Article Number *(Transfer from service label)*
9589 0710 5270 0407 3550 76

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Emmett Burns ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ [illegible]nsured Mail
- ☐ [illegible]nsured Mail Restricted Delivery [illegible]over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SCS ENGINEERS
Environmental Consultants and Contractors
8575 W. 110th Street, Suite 100
Overland Park, KS 66210

CERTIFIED MAIL®

Retail

74063

U.S. POS
FCM LET
OVERLA
MAY 14,

$8.7

R2304M1

7022 0410 0002 7224 4212

RDC 99

SALVADOR AND BELEN RUIZ
19 EAGLE DR
SAND SPRINGS OK 74063-6360

RECEIVED JUN 24 2024

NIXIE 731 DE 1 0006/15/24
RETURN TO SENDER
UNCLAIMED
UNABLE TO FORWARD
BC: 66210262025 *1428-04686-14-

UNC
66210>2620

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Osage Nation
PO Box 807
Pawhuska, OK 74056

9590 9402 8817 4005 4753 57

2. Article Number *(Transfer from service label)*

9589 0710 5270 0407 3551 06

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

Certified Mail

- A receipt (this portion of
- A unique identifier for y
- Electronic verification of delivery.
- A record of delivery (incl signature) that is retain for a specified period.

Important Reminders:

- You may purchase Certi First-Class Mail®, First-(or Priority Mail® service
- Certified Mail service is International mail.
- Insurance coverage is n with Certified Mail servi of Certified Mail service Insurance coverage aut certain Priority Mail iten
- For an additional fee, an endorsement on the ma the following services:
  - Return receipt service of delivery (including You can request a har electronic version. For complete PS Form 38 *Receipt*; attach PS Fo

PS Form 3800, January 2

SCS ENGINEERS

Environmental Consultants and Contractors
8575 W. 110th Street, Suite 100
Overland Park, KS 66210

CERTIFIED MAIL®

9589 0710 5270 0407 3551 06

9589 0710 5270 0407 3551 06

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

OFFICIAL USE

Certified Mail Fee
$

Extra Services & Fees *(check box, add fee as appropriate)*
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
$

Total Postage and Fees
$

Sent To

Street and Apt. No., or PO Box No.

City, State, ZIP+4®

Postmark Here

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

SCS ENGINEERS

Environmental Consultants and Contractors
8575 W. 110th Street, Suite 100
Overland Park, KS 66210

CERTIFIED MAIL®

9589 0710 5270 0407 3551 06

12/19

Osage Nation
PO Box 807
Pawhuska, OK 74056

NIXIE 731 DE 1
RETURN TO SENDER
UNCLAIMED
UNABLE TO FORWARD

UNC BC: 66210262025 *13

Retail

RDC 99

74056

$9.68
R2303S102079-04

U.S. POSTAGE PAID
FCM LETTER
OVERLAND PARK, KS 66213
DEC 12, 2024

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

SENDER: COMPLETE THIS SECTION

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- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Osage Nation
PO Box 807
Pawhuska, OK 74056

9590 9402 8817 4005 4753 57

2. Article Number *(Transfer from service label)*

9589 0710 5270 0407 3551 06

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

Location Restriction Summary Table

SUMMARY OF LOCATION RESTRICTION LETTERS AND FIGURES
AEL LATERAL EXPANSION
PROJECT NO. 27220345.00

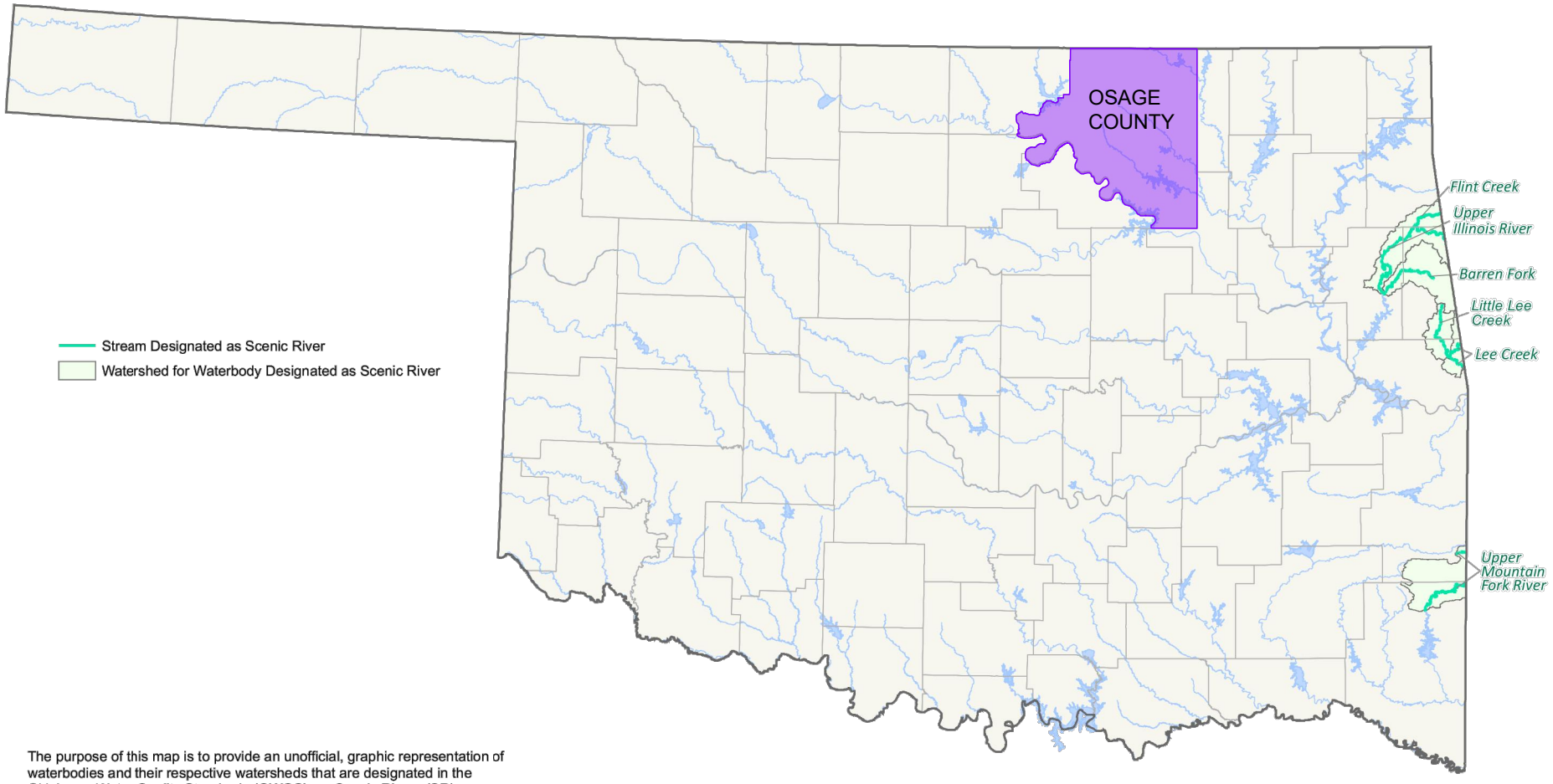
	Authorized Agency	Letter Mailed (date)	USPS Certified Mail Receipt No.	Letter Recvd (date)	Response Recvd (date)	Additional Info Needed (Y/N)	Additional Info Mailed (date)	Additional Info Recvd (date)	Additional Info Response Recvd (date)	Approval (Y/N)	Comments
Scenic Rivers	Oklahoma Scenic Rivers Commission										Figure Only
Recreation/Preservation Areas	State Historic Preservation Office	06/02/2020	70192970000224477665	06/05/2020							Only reviews Federal Undertakings
	Oklahoma Archeological Survey	06/02/2020	70192970000224477696		06/12/2020	N				Y	
	US Department of the Interior - Bureau of Reclamation	06/02/2020	70192970000224477689	06/05/2020							No response
	Oklahoma Tourism and Recreation Department	06/02/2020	70192970000224476032	06/08/2020	07/07/2020	N				Y	Email response included sketch of the Keystone Ancient Forest
Endangered or Threatened Species	Oklahoma Department of Wildlife Conservation	04/24/2019									Threatened and Endangered Species Habitat Assessment Report
	US Fish and Wildlife Service	04/24/2019			02/10/2020	N				Y	Threatened and Endangered Species Habitat Assessment Report
	Oklahoma Biological Survey				02/06/2020	N				Y	Email resonse
100 Year Floodplain	Federal Emergency Management Agency										Figure Only
Public Water Supply	ODEQ - Water Quality										Figure Only
	Oklahoma Water Resources Board										Figure Only
Wetlands	Oklahoma Conservation Commission	01/27/2020									Email including Preliminary Wetland Jurisdictional Determination Report
	Corps of Engineers	05/01/2020			10/30/2020					Y	404 Individual Permit Application SWT-2017-339 Mitigation Plan with Approved Permit Number SWT-2017-00339 and ODEQ Approval
Utility/Transmission Lines	Oklahoma Corporation Commission	06/02/2020	70192970000224477726	06/08/2020							No Response
Fault Areas	Oklahoma Geological Survey										Figure Only
Seismic Impact Zones											Figure Only
Karst Terrain											Figure Only
Earthquake Epicenter Areas											Figure Only
Alluvium & Terrace Deposits											Figure Only
Unstable Areas	Oklahoma Department of Mines	06/02/2020	70192970000224477672	06/05/2020	07/08/2020	N				Y	
Airports	Federal Aviation Administration	06/02/2020	70192970000224477702								No Certified Mail Recipt and No Response
	Pogue Airport	06/02/2020	70192970000224477719	6/5/2020							No Response
Wellhead Protection Area	ODEQ - Water Quality										Figure Only

Location Restriction Correspondence Letters

Oklahoma Scenic Rivers Commission

Oklahoma Water Quality Standards

Scenic Rivers (SR)



The purpose of this map is to provide an unofficial, graphic representation of waterbodies and their respective watersheds that are designated in the Oklahoma Water Quality Standards (OWQS), as Scenic Rivers (SR). The official version of the OWQS is published by the Oklahoma Secretary of State in the Oklahoma Administrative Code at Title 785, Chapter 45 (http://www.sos.ok.gov). A complete but unofficial version of the OWQS is available through the OWRB homepage (http://www.owrb.ok.gov).
7/1/2011

State of Oklahoma
OWRB
Water Resources Board
the water agency

EDITED BY SCS ENGINEERS TO HIGHLIGHT COUNTY OF SITE

Oklahoma Archaeological Survey

June 2, 2020
File No. 27219016.00

Dr. Debra Green
Oklahoma Archeological Survey
111 East Chesapeake, Room 102,
Norman, Oklahoma 73019-0575

Subject: American Environmental Landfill
Proposed Landfill Expansion Notification
ODEQ Permit No. 3557021

Dear Dr. Green:

As required by Oklahoma Department of Environmental Quality (ODEQ) Oklahoma Administrative Code 252:515-5-31(b), SCS Engineers is requesting a determination for the proposed expansion of the American Environmental Landfill which is owned and operated by American Environmental Landfill, Inc. (AEL). The proposed landfill expansion consists of approximately 203 acres and is located at 207 North 177th West Avenue, Sand Springs, Oklahoma 74063. Two general site location maps are enclosed.

The ODEQ regulation states the following: *no area within the permit boundary of a new solid waste disposal facility, or an expansion of the permit boundary of an existing solid waste disposal facility, shall be located within one-half mile of any area formally dedicated and managed for public recreation or natural preservation by a federal, state, or local government agency unless the appropriate management agency provides a statement that the proposed facility is not expected to adversely affect the existing recreation or natural preservation area.*

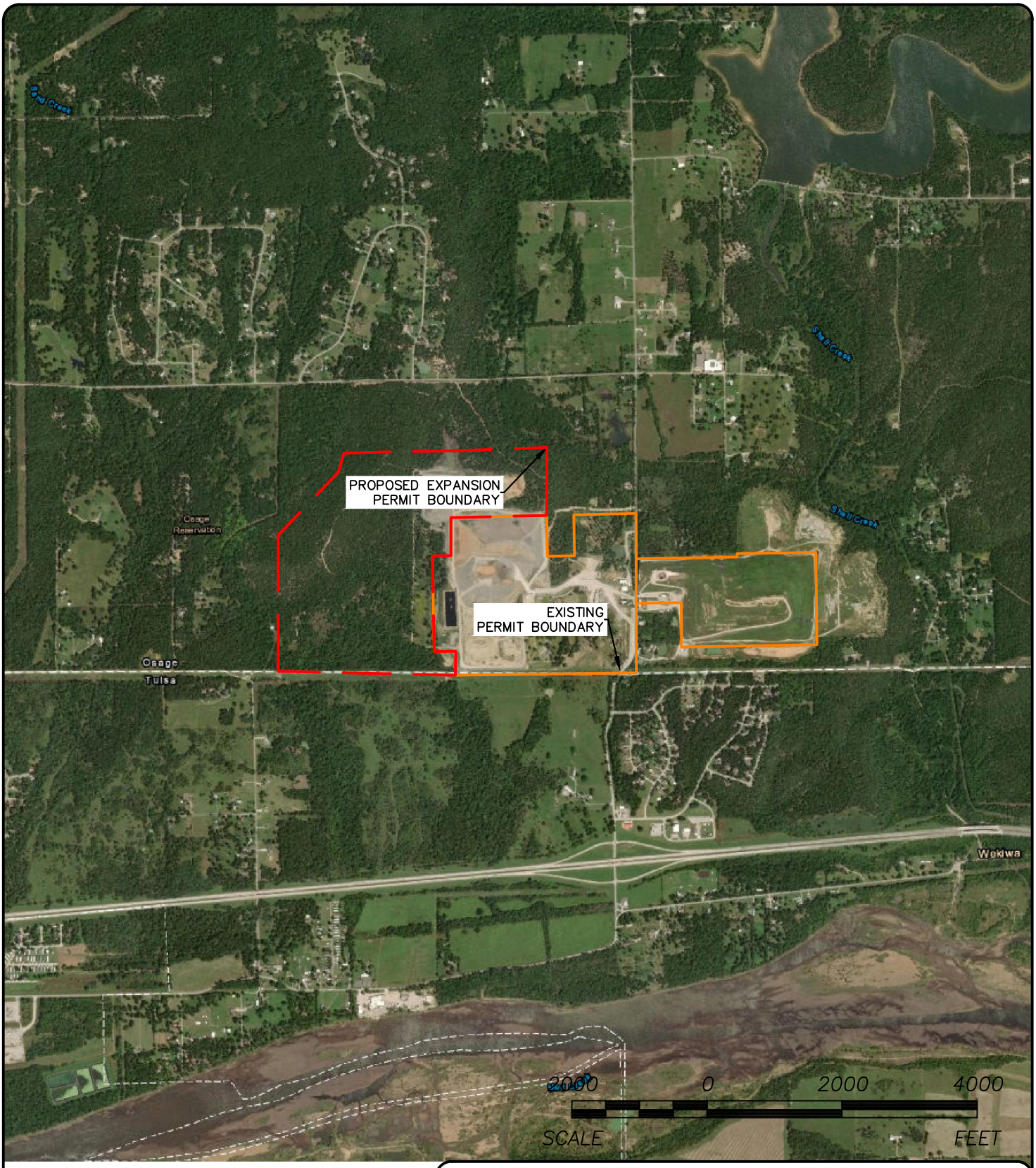
On behalf of our client, we request you review the enclosed maps and provide this determination as required by the ODEQ within 45 days of receipt of this letter. If you have any questions or comments or need additional information, please do not hesitate to contact the undersigned at (405) 246-1574. Thank you very much for your time and effort in this matter.

Sincerely,

Sarah Rafalowski, PE
Senior Project Professional
SCS Engineers

Wade Miller
Project Director
SCS Engineers

Encl. 2 General Site Location Maps



LEGEND

EXISTING PERMIT BOUNDARY

PROPOSED EXPANSION PERMIT BOUNDARY

Aerial Image Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

N

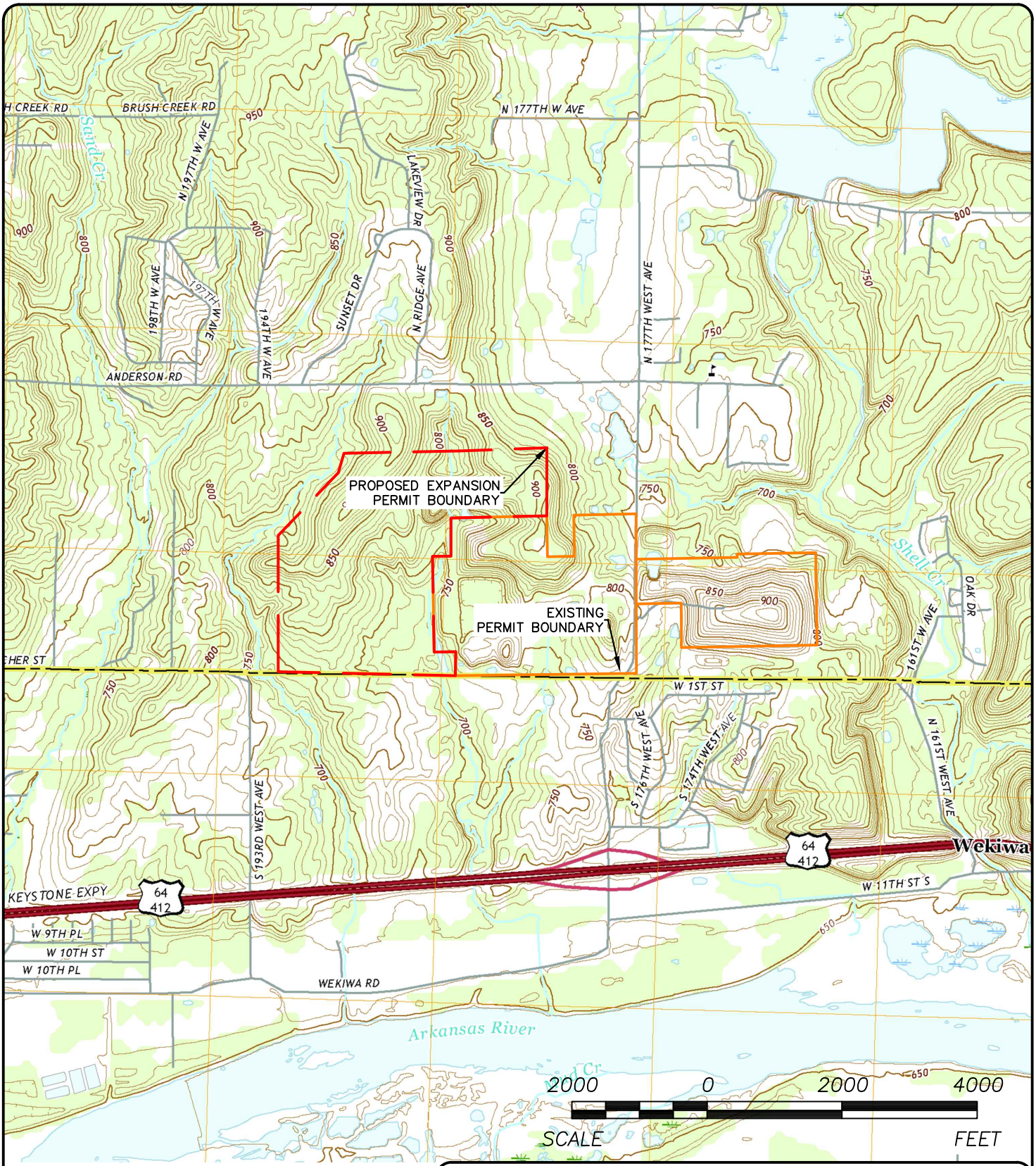
SCS ENGINEERS

STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
1817 COMMONS CIRCLE, SUITE 1
YUKON, OKLAHOMA 73099
PH. (405) 265-3960

AMERICAN ENVIRONMENTAL LANDFILL, INC.

SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/28/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 1



LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED EXPANSION PERMIT BOUNDARY

NOTE:
MAP AND CONTOURS SHOWN ARE FROM THE USGS 7.5' SERIES WEKIWA QUADRANGLE IN OSAGE AND TULSA COUNTIES, OKLAHOMA DATED 2018.

N

SCS ENGINEERS

STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
1817 COMMONS CIRCLE, SUITE 1
YUKON, OKLAHOMA 73099
PH. (405) 265-3960

AMERICAN ENVIRONMENTAL LANDFILL, INC.
SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/26/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 2

Oklahoma Archeological Survey
THE UNIVERSITY OF OKLAHOMA

June 12, 2020

SCS Engineers
Attn: Wade Miller
Project Director
1817 Commons Circle, Ste. 1
Yukon, OK 73099

Re: OAS FY20-2378 SCS Engineers Proposes American Environmental Landfill, Inc (AEL)
Proposed Landfill Expansion: 207 North 177th West Ave, Sand Springs.
Legal Description: Portions of Section 35 & 36, T20N, R10E, Osage County, Oklahoma.

Dear Mr. Miller:

The Community Assistance Program staff of the Oklahoma Archeological Survey has reviewed the above referenced project in order to identify areas that may potentially contain prehistoric or historic archeological materials (historic properties). The location of your project has been crosschecked with the state site files containing approximately 26,000 archaeological sites, which are currently recorded for the state of Oklahoma. No Sites are listed as occurring within your project area, and based on the topographic and hydrologic setting, no archaeological materials are likely to be encountered. Thus, an archaeological field inspection is not considered necessary. Please contact this office at (405) 325-7211 if buried archaeological materials such as chipped stone tools, pottery, bone, historic crockery, glass, metal items or building materials are exposed during construction activities.

This environmental review and evaluation is done in cooperation with the State Historic Preservation Office, Oklahoma Historical Society. The responsible federal agency or their official delegate must also have a letter from that office to document consultation pursuant to Section 106 of the National Historic Preservation Act.

In addition to our review comments, under 36CFR Part 800.3 you are reminded of your responsibility to consult with the appropriate Native American tribe/groups to identify any concerns they may have pertaining to this undertaking and potential impacts to properties of traditional and/or ceremonial value.

Sincerely,

Debra K. Green, Ph.D.
Assistant State Archaeologist

Kary L. Stackelbeck, Ph.D.
State Archaeologist

: ksw
cc: SHPO

CULTURAL RESOURCE SURVEY FOR THE AMERICAN ENVIRONMENTAL LANDFILL IN SAND SPRINGS OSAGE COUNTY, OKLAHOMA

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Cox | McLain Environmental Consulting, Inc. Archeological Report 264
(CMEC-AR-264)

COX | McLAIN
Environmental Consulting

February 28, 2020

This report contains archeological site location information (not for public disclosure.)

MANAGEMENT SUMMARY

American Environmental Landfill in Sand Springs proposes to expand the city landfill located approximately 5 miles northwest of town in Sand Springs, Osage County, Oklahoma. The proposed project requires a U.S. Army Corps of Engineers (USACE) Permit. Due to USACE involvement, this is a federal undertaking and is, therefore, subject to Section 106 of the National Historic Preservation Act, as amended.

In August and September 2019 and February 2020, an intensive cultural resources survey was performed for the proposed American Environmental Landfill, Sand Springs expansion. The area of potential effects (APE) is considered to be the entire proposed expansion area, which consists of 277 acres north and west of the current American Environmental Landfill in Sand Springs. This includes a 10-acre mitigation area and a 62-acre area that will not be subject to ground disturbance.

The survey included the excavation of 344 shovel test units. No cultural materials were observed or recorded in any of the excavated shovel test units or on the ground surface anywhere within the APE. One archeological isolated find (IF-01) and one built environment resource were recorded. Site IF-01 is a rock wall of unknown age; no other cultural materials were observed at this location. The built environment resource is a house built in 1955 and an associated non-historic age shed.

Site IF-01 was assessed for the National Register of Historic Places (NRHP) under Criteria B and D. No connections with significant individuals were made and no additional information is likely to be found through further archeological investigations.

One built environment resource was identified in the survey, it is recommended not eligible for the NRHP and was assessed under Criterions A, B, C, and D. No further work is recommended at this time.

Archeological fieldwork was carried out by Christy Stewart (Principal Investigator and Project Archeologist), Haley Rush (Principal Investigator), Craig Cosby, Delaney Cooley, Hannah Pottage, Shane Manion, Kim Wright, Savanna Cometa, and Barry Dwiggins of CMEC. Marcus Huerta (Historian) consulted on the built environment resources.

If any unanticipated cultural materials or deposits are found at any stage of the proposed action, the work should cease, and USACE and the State Historic Preservation Office should be notified immediately.

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1 INTRODUCTION

Overview of the Project

American Environmental Landfill in Sand Springs has proposed the construction of a landfill expansion located approximately 8 kilometers (roughly 5 miles) northwest of town in Sand Springs, Osage County, Oklahoma. The proposed landfill expansion covers approximately 277 acres and will extend north and west of the existing landfill. This includes a 10-acre wetland mitigation area and a 62-acre area that has already been subjected to ground disturbance.

Cox | McLain Environmental Consulting, Inc. (CMEC) was contracted by SCS Engineers to perform cultural resources investigations including pedestrian archeological survey with shovel testing and an examination of the built environment within the 277-acre study area (**Figure 1**). SCS Engineers has been contracted with the American Environmental Landfill in Sand Springs. The archeological area of potential effects (APE), or study area, includes the 277-acre area for the new landfill, 62-acre area that has already been disturbed, and a 10-acre wetland mitigation area. The legal location of the project area is E ½ of Section 35 Township 20N Range 10E and NW ¼ Section 36 Township 20N Range 10E.

Regulatory Responsibility

The project will require a permit from the U.S. Army Corps of Engineers (USACE). Due to USACE involvement, this project is a federal undertaking and is, therefore, subject to Section 106 of the National Historic Preservation Act (NHPA), as amended (16 United States Code 470; 36 Code of Federal Regulations [CFR] 800).

Methodological and Logistical Considerations

Craig Cosby, Delaney Cooley, Hannah Pottage, Shane Manion, Kim Wright, and Barry Dwiggins of CMEC, under the direction of Christy Stewart (Principal Investigator and Project Archeologist) and Haley Rush (Principal Investigator), performed the archeological fieldwork in August and September of 2019. Lead staff meet the Professional Qualification Standards as defined in the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (48 CFR 44716).

The APE was thoroughly inspected through archeological pedestrian survey including the excavation of 341 shovel tests and was examined for historic-aged built resources.

Structure of the Report

Following this introduction, Chapter 2 presents the project's environmental and cultural contexts, as well as a summary of previous archeological research near the APE; Chapter 3 discusses research goals, relevant methods, and the underlying regulatory considerations; Chapter 4 presents the results of the survey and summarizes the implications of the investigations, and Chapter 5 presents references cited.

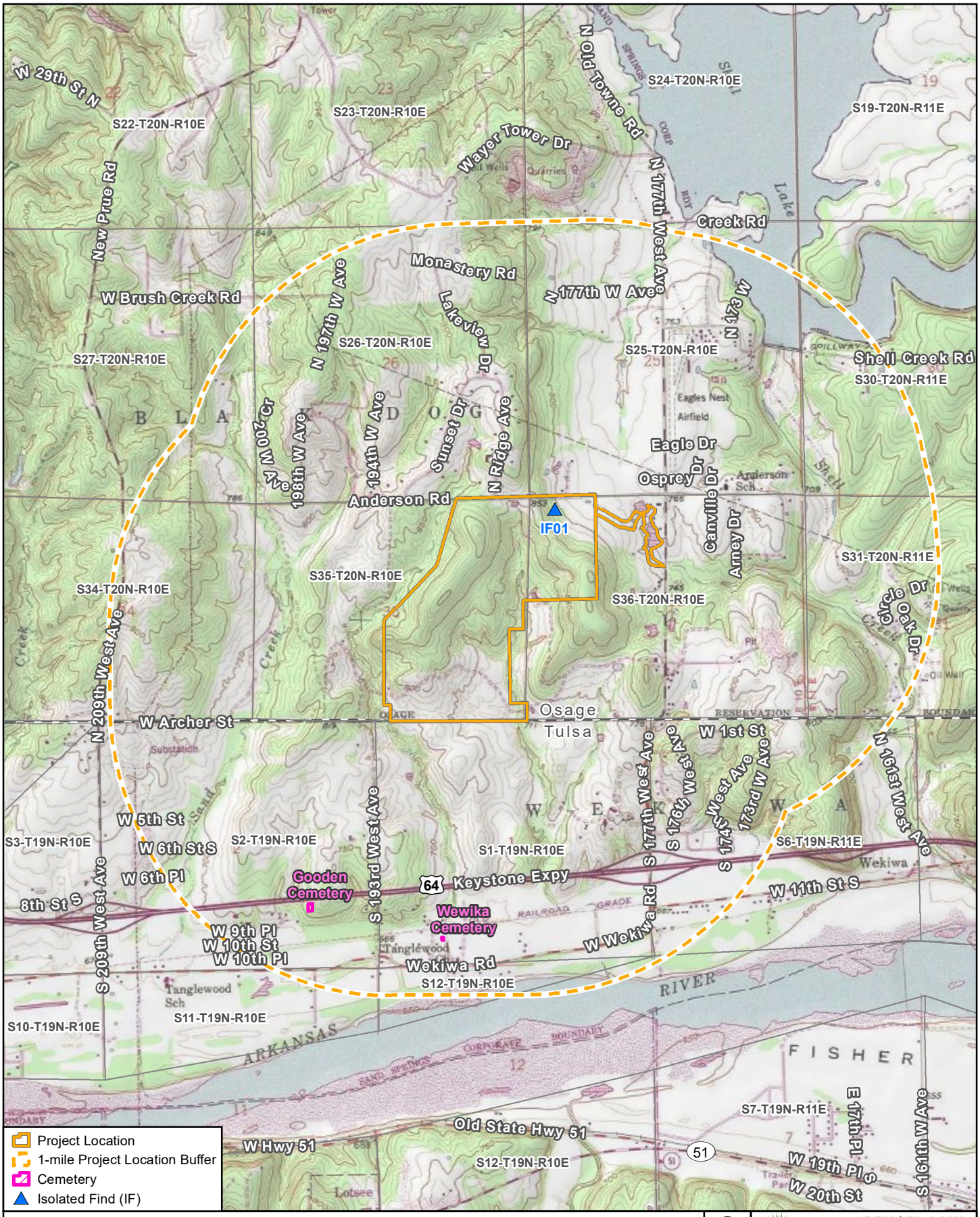

Figure 1. Location of Archaeological APE

American Environmental Landfill, Sand Springs
Osage County, Oklahoma

Data Sources: CMEC (2019-2020), OU CSA (2017)
Topographic Source: USGS Wekiwa 7.5' Quadrangle (1983)

COX | McLAIN Environmental Consulting

0 2,500 Feet
0 800 Meters

1 inch = 2,500 feet
Scale: 1:30,000
Date: 2/25/2020

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2 ENVIRONMENTAL AND CULTURAL CONTEXTS

Topography, Vegetation, Geology, and Soils

The APE ranges in elevation from approximately 221 to 279 meters (728 to 918 feet) above mean sea level (see **Figure 1**). The APE begins 421 meters (1,383 feet) west of the intersection of Anderson Road and North 177th West Avenue northwest of town and covers 277 acres north- and west-adjacent to the current American Environmental Landfill in Sand Springs.

The APE is mapped within the Osage Cuestas subregion of the Central Irregular Plains ecoregion, which is characterized by a mosaic of rangeland, grassland, cropland, and woodland covered with mostly tall grass prairie; pastureland is the primary land use activity in this region (Woods et al. 2005). Geologically, the APE is underlain by three lithological units: Middle Pennsylvanian-age Iola Limestone, Middle Pennsylvanian-age Chanute Formation, and Pleistocene-age Terrace Deposits. The Iola Formation, located in the northwest portion of the project area, ranges in thickness between 1 to 30 meters (4 to 100 feet) and consists of limestone, and shale. The Chanute Formation, located in the northeast portion of the project area, ranges in thickness between 3 to 45 meters (10 to 150 feet) thick and is comprised of fine to coarse-grained sandstone and shale. Terrace deposits, located in the southern portion of the project area, have a maximum thickness of around 23 meters (75 feet) along major streams and consist of fine gravel, sand, silt, and clay (U.S. Geological Survey [USGS] 2018a).

According to Natural Resources Conservation Service (NRCS) data, nine soils or soil complexes are within the APE; these are detailed in **Table 1.** The southern and middle portion of the APE are predominately Niotaze-Bigheart rock outcrop, while the northern portion of the APE is mostly Norge silt-loam and some Niotaze-Bigheart rock outcrop. Niotaze-Bigheart rock outcrops are sloped landforms; these tend to lack the conditions necessary for deeply buried cultural deposits due to thin soils and are considered to have low potential for buried cultural resources. The Agra-Ashport soil complex, Parsons-Pharoah soil complex, Norge silt Loam, Eufaula soil series and Dougherty soil series all have shallow A-horizons that extend between 0 and 30 centimeters (11.8 inches) below ground surface. No buried A-horizons or paleosols are mapped in the project area, and these soils have a low potential for intact buried cultural resources.

Table 1: Summary of Soil and Soil Complexes in Project APE (North to South)

Soil Name	Slope Percent	Dominant Texture Type	Drainage Class	Geomorphology
Agra-Ashport	0–12	Multiple	Moderately well drained	Hillslopes/backslope
Parsons-Pharoah	0–3	Multiple	Somewhat poorly drained	Paleoterraces
Norge	5–8	Silt Loam	Well drained	Paleoterraces
Niotaze-Bigheart	0–15	Rock Outcrop	Somewhat poorly drained	Hillslopes/backslope
Bigheart-Niotaze	3–5	Rock Outcrop	Somewhat poorly drained	Hillslopes/backslope

Soil Name	Slope Percent	Dominant Texture Type	Drainage Class	Geomorphology
Norge	3–5	Silt Loam	Well drained	Paleoterraces
Niotaze-Bigheart	15–25	Rock Outcrop	Somewhat poorly drained	Hillslopes/backslope
Eufaula	3–15	Loamy Fine Sand	Well drained	Dune fields/ terraces
Dougherty	3–8	Loamy Fine Sand	Well drained	Hillslope/backslope

Source: Soil Survey Staff 2019.

Archeological Chronology for Northeastern Oklahoma

The archeological chronology of Oklahoma is relatively uniform across the entire state for the earliest periods of human occupation (i.e., Pre-Clovis and Paleoindian), with regional distinctions appearing later in the Archaic and Woodland Periods. **Table 2** presents a general chronology supplemented with more detail for the periods relevant to the current study area (i.e., the eastern portion of the state).

Table 2: Archeological Chronology for Oklahoma

Period	Years Before Present (BP)
Pre-Clovis	35,000 (?) – 12,000
Paleoindian	12,000–8,000
Clovis	12,000–11,000
Folsom	11,000–10,000
Dalton	10,500–9,900
Archaic	8,000–2,000
Wister Phase	3,500–2,000
Woodland	2,000–1,200
Wister Phase (continued)	2,000–1,700
Fourche Maline	1,700–1,200
Villager	1,200–500
Protohistoric	500

Sources: Data from Bell (1984, ed.), Brooks (2009); Galm (2009)

Many sites recorded in Oklahoma are now underneath reservoirs and lakes. Archeological salvage projects for these reservoir and lake projects, completed between 1935 and 1972, provide most of what is known archeologically about eastern Oklahoma (Wyckoff 1984). Most of the data on the earliest inhabitants of Oklahoma (i.e., from the Paleoindian Period) come from the western part of the state (Gettys 1984).

Prehistoric groups demonstrated remarkable adaptability to diverse settings and changing environmental conditions across what is now Oklahoma. For years, the Clovis Period (approximately 11,000 to 12,000 years ago), was thought to represent the initial inhabitants of the New World. However, recent studies suggest that the peopling of the Americas may have occurred 20,000 to 30,000 years ago. Two sites in Oklahoma (the Cooperton mammoth site and the Burnham site) both produced

radiocarbon dates between 28,000 and 32,000 years ago, and both contained Pleistocene-age animal remains. Because of uncertain contexts at both sites, the lifeways of these early inhabitants are poorly understood (Brooks 2009; Gettys 1984). Also contributing to a general ambiguity is the fact that many of these early sites in Oklahoma were recorded based only on surface scatters of lithics.

The Paleoindian Period is divided into the earlier Clovis Period (11,000 to 12,000 years ago) and the Folsom Period (around 10,000 years ago). The people who lived during the Clovis and Folsom Periods are termed "Specialized Hunters" by some (Brooks 2009). Gettys (1984) distinguishes between Clovis and Folsom as "Elephant" and "Bison" hunters, respectively. Generally, Paleoindian groups were nomadic, following large animal migrations. Their method of stalking and killing large game required complex knowledge and strategy and the use of highly specialized, well-designed chipped stone tools and weapons. Evidence suggests that people at this time were also incorporating edible plants into their diet (Gettys 1984).

Clovis Period artifacts are found across the state of Oklahoma, but rarely in contexts that have integrity. The Domebo Site is one of the only well-documented Clovis sites within the state. Folsom Period sites are restricted to the western portion of the state. The eastern part of the state was inhabited by people of the Dalton Culture, which is distinguished by occupations within woodland habitats, larger group sizes and a subsistence strategy combining hunting with collecting (Gettys 1984). For example, the Packard Site is a well-documented site with a Dalton component located in Mayes County, which is located west of Delaware County. In the central and western part of the state the Calf Creek Culture was quite prevalent. This nomadic culture was widespread throughout the region, during an especially hot and arid period, specializing in stone tools and Plains hunting.

During the Archaic period (8,000 to 2,000 years ago), native peoples in the eastern and central part of the state continued to focus on hunting and collecting, added a greater range of edible plants to their gathering, and added trading to their economies (Brooks 2009; Wyckoff 1984). Although still quite mobile, these people only moved their settlements from one seasonally available set of resources to another. This change resulted in a more diverse tool kit—primarily a set of tools related to plant procurement. As populations increased and group mobility and access to resources became more restricted, conflicts occurred. In addition to conflict, more frequent interactions among these larger populations increased opportunities for trade. These shifts necessitated more complex political and social leadership and fostered the development of formalized religious beliefs and rituals (Brooks 2009; Wyckoff 1984). Many of the themes discussed here are speculative; the Packard Site (34MY66) is the only site in eastern Oklahoma that has dated Early Archaic deposits (Wyckoff 1984), as well as the Dalton component mentioned above.

During the latter part of the Archaic period, archeological sites offer evidence that many diverse groups occupied eastern Oklahoma (Brooks 2009; Galm 1984; Wyckoff 1984). Archeological evidence suggests that groups who lived north of the Arkansas River were distinctly different from groups that lived south of the river. During this time, known as the Wister Phase, the groups who lived south of the

Arkansas River and north of the Ouachita Mountains would likely have depended on riverine resources (Galm 2009).

According to Galm (2009), the Wister Phase is generally limited to the Arkoma Basin of east-central Oklahoma and dates from approximately 1,500 to 300 BCE. Pottery was adopted at the end of the Wister Phase, which corresponds to the beginning of the Fourche Maline Phase and the Woodland Period (discussed below). Common artifacts include Gary points, bone, shell, and ground stone artifacts. The connecting features of the period in this region are "midden mounds," which are formed when a locale is repeatedly used for disposal. These mounds contain stratified deposits dating from the Archaic to the Woodland Period and often contain burials (Galm 1984, 2009). Evidence suggests that the people living during the Wister Phase occupied midden-mound sites year-round, although likely intermittently.

A distinctive culture is seen within the central portion of the state, though it was quite similar to its eastern counterparts. The more central groups differed from their eastern contemporaries in several ways: they were much more dispersed than before, they lived less intensively than their counterparts, and they focused on less sedentary hunting and gathering of plains flora and fauna (Galm 2009).

The Woodland (or Agricultural Beginnings) Period is an era of larger populations with reduced mobility and a greater knowledge of plant cultivation (the catalyst for the beginning of true agriculture, or more dependence on edible plants). The social, political, and religious changes with origins in the previous period became more expressive and widespread (Vehik 1984, 2009). Use of storage facilities and permanent dwellings also expanded. During this period, the introduction of the bow and arrow improved hunting and warfare abilities, the development of pottery permitted permanent and secure storage, and the manufacture of specialized axes and adzes for clearing and framing structures improved shelters (Brooks 2009; Wyckoff 1984).

The Fourche Maline Focus falls within the Woodland Period but is geographically restricted to the eastern part of the state (Brooks 2009; Galm 1984; Vehik 1984, 2009). The Fourche Maline Focus continues to see the formation of midden mounds but is marked by the appearance of ceramics, which separates it from the preceding Wister Phase. The Fourche Maline Focus may have begun as early as 300 BCE and terminates around 800 CE. The use of Gary points continues in this part of the Woodland Period, and the dominant ceramic type is Williams Plain (Brooks 2009).

In the Arkansas River Valley of the north-central part of the state, a distinctive culture akin to the Kansas City people has been observed during the Woodland period. Lithic technologies and pottery have been documented, specifically from sites such as Hammons and Hudsonpillar sites in Kay County, as has a continued use of plains flora and fauna. During this period, various sites in this region demonstrate the continuation of Archaic-period traditions such as hunting, gathering, and trading (Brooks 2009).

Numerous societies of Agricultural Villagers lived in settled farming communities all across Oklahoma. Permanent housing took the form of small hamlets and large villages strategically placed near highly

fertile soils, but outside areas in danger of flooding. Subsistence changed dramatically with increasing emphasis on certain edible plants and plant domestication. Hunting of a variety of animals continued as well. Technologies expanded during this period: the variety of plant-processing stone tools increased; variety in ceramic usage, forms, color, and decorations increased; extravagant ornaments began to appear; and material goods were increasingly used in ritual and religious contexts (Brooks 2009).

In the eastern part of the state, another cultural manifestation appeared: the construction of earthen mounds. These mounds served a variety of political and religious functions. The mound-building tradition was the beginning of the Caddoan tradition, which is well-documented along the Arkansas River and its tributaries in the eastern portion of the state (Brooks 2009). Documented Caddoan sites in the eastern part of the state include mound centers, rockshelters, large villages, small farmsteads, and temporary campsites (Wyckoff 1980).

The Caddo, or Caddoan Mississippians, are thought to be descendants of the Fourche Maline and Mossy Grove culture peoples from the Woodland period (Bell 1984). Early Caddo were linked to many other Eastern Woodlands cultures through extensive trade networks, which introduced Caddo people to pottery, bows, and other goods and tools (Carter 1995). By 800 CE, early Caddoan society began incorporating into one of the earlier Mississippian cultures, and villages began transitioning into socially stratified ritual and economic centers (Carter 1995).

Definitively "Caddo" society emerged by 1000 CE, and major sites such as Spiro and Battle Mound rose to prominence in the Arkansas and Red River Valleys, respectively (Carter 1995). These sites were surrounded by large expanses of fertile soils and extensive maize agriculture. Featuring a distinct type of ceramic wares, Caddo villages prospered by maintaining large food surpluses of maize, beans, squash, and pecans. Trade aided this prosperity as the Caddo became skilled manufacturers of bows and pottery. Following centuries of growth, Caddo populations peaked around the year 1400, when many ritual centers began to shrink in size and population. Caddo occupation became sparser and more centered around smaller farms and homesteads than large centers. Further information about the Caddo is presented below in the Tribal and Protohistoric section (Brooks 2009).

The Protohistoric period is one of drastic changes, primarily due to a cycle of drought conditions that began in the thirteenth century and lasted until about 200 years ago. Temperatures were also cooler, resulting in some abandonment or scaling back of agriculture. This allowed some Native societies to revert to more nomadic patterns as communal hunters of bison, which were quite plentiful (particularly on the plains). Villages in the east continued to be maintained but were abandoned seasonally to follow the bison herds. This cool, dry period also caused an influx of other groups from the west and north, which affected the societal balance in the area. The advent of Europeans in the western hemisphere caused further disruption to the already unstable dynamics of the local Native populations. Disease was the most devastating result of European exploration, but the introduction of the horse changed hunting and warfare. Metal goods, though used in a functionally consistent fashion, were also used to make arrow points, knives, and scrapers, all of which gradually replaced some stone tools (Brooks 2009).

The earliest European explorers to arrive in eastern Oklahoma were the Spanish and the French. European documents describe the people in this area as Caddoan speakers. The Caddo groups prospered by trading with the French, until constant raiding by the Osage caused the Caddo people to move further south. The Osage are thought to have occupied the Arkansas River valley by 1750. Due to constant raiding by the Osage, Fort Gibson was eventually established in the northeastern part of the state in 1824. During this time the Cherokee began to settle in the area. The Choctaws used the eastern part of the state for hunting and were later joined by the Chickasaws (Miller 1977).

Several battles of the Civil War took place in northeastern Oklahoma, with most of the tribes joining the Confederacy. After the loss of the war by the Confederacy, some tribes were forced to give up land to the U.S. government; however, most of the land held by the Cherokee, Choctaws, and Creeks (i.e., tribal lands in eastern Oklahoma) remained in their hands (Brooks 2009).

Tribal Context

The tribes and/or nations described below are those that are known to have been present in the study area in prehistory and/or been removed from, relocated to, or passed through the area during relocation. Exclusion of a tribe or nation does not mean that a tribe or nation does not have an interest in the study area.

Caddo Nation

At the time of European contact, the Caddo were centered around a cluster of villages near the great bend of the Red River, in what is now northeast Texas, southwest Arkansas, and southeast Oklahoma (Carter 1995). By 1520, an estimated 250,000 Caddo people lived in the area (Meredith 2009). The following 250 years would see a massive reduction in population because of disease, which spread across the trading networks that had been so advantageous for centuries. At some point after contact, Caddo people organized three confederacies: the Hasinai, Kadohadacho, and Natchitoches (Meredith 2009).

The Kadohadacho kept open contact with the Spanish, French, and Anglo-Americans, learning their languages as well as those of the nearby tribes. In 1835, the Kadohadacho and Natchitoches communities agreed to relocate from the U.S. to Mexico. In the then-Mexican province of Texas, these groups hoped to settle within the Hasinai confederacy, a task that was greatly complicated by the 1836 Texas Revolution (Meredith 2001).

When Texas became a state in 1845, the Kadohadacho and Hasinai were removed to the Brazos Reservation in Texas (Meredith 2001, 2009). This reservation was located on the Brazos River, about 75 miles west of Fort Worth, and was intended to house dwindling groups of Caddo, Wichita, and other tribespeople. White settlers soon encroached, and in 1859 these groups were again removed, this time to Indian Territory. Caddo life in Indian Territory was disrupted by the outbreak of the American Civil War, but in the years following the Civil War they learned to thrive in west-central Oklahoma. Caddo

populations were concentrated in and around their reservation between the Washita and Canadian Rivers; individuals often intermarried with people from other tribes. The Caddo were able to bolster their population during this time, but still struggled to endure forced assimilation into American society. The 1887 Dawes Act broke tribal lands into individual allotments, and in 1902 lands were granted to the Caddo and placed in trust by the U.S. government (Meredith 2001, 2009).

Under the Oklahoma Indian Welfare Act of 1936, the Kadohadacho, Hasinai, Hainai, and others established a government known as the Caddo Indian Tribe of Oklahoma. Today, this governing body continues as the Caddo Nation of Oklahoma, a federally recognized tribe. Overseen by a tribal council based in Binger, Oklahoma, at least 5,000 members are enrolled and at least 2,500 of them still reside in Oklahoma (U.S. Census Bureau [USCB] 2013). Caddo tribespeople continue to maintain tribal traditions of dance, song, story, and art and seek to preserve the language and values of their ancestors (Meredith 2001, 2009).

Cherokee Nation

Although there are multiple possible explanations of the origins of the Cherokee, the most-accepted version describes the Cherokee branching off from the Pisgah Phase of the Southern Appalachian Mississippian Culture between 1000 and 500 years ago (Clark 2009). The Cherokee expanded across Tennessee and North and South Carolina, constructing and residing in villages that included plazas and earthen mounds with temples. Mounds were no longer in use by the time European contact was made, but plaza spaces were still present. At the time of the first European contact, the Cherokee had the largest population in the Southeast, with approximately 30,000 people spread across 50 to 80 towns covering an area of 40,000 square miles (Clark 2009).

In the late 1600s, the Cherokee inhabited portions of what is now Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Tennessee and Kentucky (Conley 2005). This vast area was split into three regions of Cherokee: the upper region (or the Overhills), the middle region, and the lower region (or Lowerhill). Three different dialects were spoken, one in each of the regions. The middle region, the center of Cherokee habitation area, spoke the "Kituwah" dialect, the other dialects were the eastern or "Underhill" and western or "Overhill" dialects. James Mooney, a government ethnologist who lived among the Eastern Band of Cherokee Indians in North Carolina during the 1890s, explains that the name "Cherokee" had great significance for the Cherokee people, and that it was a Choctaw word meaning "pit or cave." Mooney also documented seven mother towns in the three regions, and in the center of the vast area was the town called Kituwah (from Leeds 1996). Kituwah represented the nucleus of the tribe. Mooney observed that many of the Cherokee people referred to themselves as Ani-Kitu-wha-gi, or 'people of Kituwah,' and that the Shawnee, Delaware, and other Northern tribes used Keetoowah and Cherokee interchangeably for reference to the tribe (Leeds 1996).

Interaction between European and Cherokee cultures changed the Cherokee economy and political system immensely (Clark 2009). Factions arose within the tribe when conflict arose between the

traditionalists and the acculturated Cherokees as the Cherokee were pulled back and forth between the European polities. During the Seven Years War, the traditionalist Cherokees sided with the French and moved to Arkansas at the conclusion of the war. After the Revolutionary war, the Cherokees that had sided with the British joined them in Arkansas. The Chickamauga Cherokees, another group that had broken with the larger Cherokee group due to disagreements over their associations with the white settlers, joined the Arkansas Cherokee in 1794 (Leeds 1996). The Arkansas Cherokee became known as the Western Cherokee and the "Old Settlers," and for a short while were recognized separately from the Eastern Cherokee (Cherokee that were located in their original territories in the southeast) by the new U.S. government (Leeds 1996).

By 1839, the Eastern Cherokee had been removed and relocated to Indian Territory from Tennessee and Georgia as part of a forced migration in what historically became known as the Trail of Tears. Roughly one-fourth of the Eastern Cherokee population perished because of starvation, disease, and the harsh environment during this trek to northeastern Oklahoma. With the Cherokees' arrival in Oklahoma the tribe remained a unified community and fought for an independent, sovereign Cherokee nation, despite great loses in population and a bitter civil war between divided Cherokee factions. As early as 1839 the Cherokee had unified and established a sovereign nation (Clark 2009).

By 1846, the tribe began to flourish as tribal members developed their own newspapers and educational institutions. During this period, the tribe had an increase in educational, cultural, and social institutions, which lead to the development of its own writing system and to greater economic prosperity.

By 1860, the Cherokee in Indian Territory struggled against constant and systematic attempts by the U.S. government to disenfranchise and dissolve the Cherokee community. Through institutionalized governmental policies, which included the practice of land allotment (the settling of tribal land by white settlers) and a myriad of other policies, the Cherokee suffered greatly for many decades (Clark 2009). These atrocities led to the dwindling of the Cherokee Nation and its identity and almost led to the extinguishment of the tribe. Since the 1950s, the tribe has been able to fight against the dissolution of their cultural community and has slowly reestablished itself through economic and cultural programs and the rebuilding of the Cherokee government (Clark 2009).

Today, the Cherokee Nation are proud that the tribe is in its seventh generation of tribal membership, and that the Nation has grown to over 365,000 currently enrolled citizens (Clark 2009). The Nation is headquartered in Tahlequah, Oklahoma, and is committed to protecting the tribe's sovereignty; preserving and promoting Cherokee culture, language and values; and enhancing the overall quality of life for Cherokee Nation citizens through numerous political, cultural, and economic ventures (Clark 2009).

Kaw Nation

Once known as the Kansa (or Konza) tribe, the people of Kaw Nation are descendants of Dhegiha-Siouan speakers. According to ethnohistorians, it is likely that Kaw, Osage, Ponca, Omaha, and Quapaw

people (the Dhegiha-Siouan Hopewell cultures) lived together as a larger group prior to the invasion of white settlers to North America during the late fifteenth century. Prompted by a search for more abundant resources and increasing pressure from the powerful Algonquians to the east, these groups (including the Kaw) emigrated to the Ohio River Valley (Unrau 2017).

As part of the "upstream people", Kaw settlers eventually moved into what is now Kansas from the lower Ohio Valley at some point before 1750. The Kaw assumed control of the region in and around present-day Kansas City, as well as the Kansas River Valley to the west. By the mid-eighteenth century, the "Wind People", as they were known to whites, were in possession of most of present-day northern and eastern Kansas. By 1800, imported diseases (such as smallpox, cholera, and influenza) decreased the Kaw population to less than 50 percent of its previous size, or around 1,500 men, women, and children (Unrau 2017).

In 1825, the Kaw agreed to cede 18 million of their 20 million acres of holdings in exchange for financial compensation in the form of cash, cattle, hogs, and fowl, as well as a government blacksmith, an agricultural instructor, and schools. Following this cession, the Indian Removal Act of 1830 forcibly transplanted nearly 100,000 people from many tribes onto lands claimed by the Kaw and Osage. This forced the Kaw to sign treaties ceding even more of their lands in return for promises from the U.S. government. Victims of nineteenth-century white land speculators, traders, and missionaries, and of the federal government's policy of tribal concentration and dissolution, the Kaw were forcibly removed to a small reservation in present-day Kay County, Oklahoma, in 1873 (Unrau 2017).

Following allotment in 1902, the Kaw tribe retained 260 acres of trust land from their former reservation. This tract was later flooded by the construction and filling of the Kaw Reservoir in the mid-1960s. As a result, the Kaw Council House and cemetery were relocated. In 2000, the Kaw Nation purchased the remainder of their pre-1873 reservation, near Council Grove, Kansas, which will be developed into an educational park. As of 2002, the Kaw Nation of Oklahoma lists 2,553 enrolled members, a figure more than ten times larger than the 249 individuals registered more than a century ago (Kaw Nation 2017).

Kialegee Tribal Town

Members of the Kialegee Tribal Town share ancestry with the Muscogee Creek people. According to their own oral tradition, the Kialegee are a daughter town of Tuckabatche, which split off from the larger Muscogee Creek while settling in modern Alabama and Georgia (Moore 2009). Eventually, Kialegee spawned two more Mvskoke-speaking towns: Auchenauhatche and Hutchachuppe.

Prior to suffering massive losses from disease and invaders, Kialegee Tribal Town had a population of over 20,000 and was one of the largest of the 50 towns that comprised the Muscogee Confederacy. Between 1814 and 1826 the Kialegee remained in Alabama and signed several land treaties with the U.S. Government. After the passing of the Indian Removal Act in 1835 they were removed to Indian Territory (Clark 2009). After removal, members of Kialegee Town lived south of present-day Henryetta,

Oklahoma. Following the allotment of lands, many relocated west near where the Kialegee administration building and tribal court building stand today (KTT 2011; Moore 2009).

Like the people of Thlopthlocco Creek Tribal Town, members of the Kialegee Tribal Town established their own tribal government following the Oklahoma Indian Welfare Act of 1936 (Clark 2009). Kialegee Tribal Town is currently headquartered in Wetumka, Oklahoma, and the tribe claims 700 enrolled tribal members (KTT 2011).

Muscogee (Creek) Nation

The Muscogee (Creek) people are descendants of the people of the Mississippian culture. Sites and artifacts from the Mississippian Period are found throughout the southeastern U.S. from roughly 1200 to 400 years ago (Worth 2000). These early ancestors of the Muscogee built expansive towns within the river valleys in areas now known as Alabama, Georgia, Florida, and South Carolina. At the time of European contact, the Muscogee population was concentrated in two main areas in Alabama and Georgia: along the Coosa and Tallapoosa Rivers and along the Chattahoochee and Flint Rivers. These groups were known to the English as the Upper Creeks and Lower Creeks. The Muscogee represent a union or confederacy of numerous tribes, including the Alabama, Coosa, Koasati, Tuskeegee, Coweta, Cusseta, Oakfuskee, Tuckabatchee, Yuchi, and many others (Isham and Clark 2009; Walker 2004).

In the early 1800s, U.S. policies on Indian removal forced the relocation of many southeastern tribes to areas west of the Mississippi River (Walker 2004). In 1832, the Muscogee signed the Treaty of Cusseta, which exchanged their ancestral homelands for land in Indian Territory, in what would become Oklahoma in 1907. Most Muscogee accepted relocation, but many were forcibly removed and relocated by the U.S. Army to Indian Territory in 1836 and 1837.

After arriving in Oklahoma, tribes from the Upper Creeks settled along the North Fork, Deep Fork, and Canadian Rivers, and tribes from the Lower Creeks settled near the Arkansas and Verdigris Rivers (Isham and Clark 2009). All the tribes set up farms and plantations to support themselves. This initial period in Oklahoma marked a time of relative prosperity for the Muscogee. Subsequently, the tribes experienced disastrous losses in the American Civil War as tribal members fought for both the Union and the Confederate armies (Clark 2009). Additionally, the 1866 reconstruction treaty took 3.2 million acres from the Muscogee, which represented roughly half of their domain.

The following year, the Muscogee or Creek Nation installed a new, modernized tribal government and ratified a new constitution (Clark 2009). Also in 1867, the Creek Nation established a new capital on the Canadian river, near Okmulgee. In 1878, the Creek Nation erected a stone Council House, which still stands as a National Historic Landmark in Okmulgee.

Today, the Muscogee (Creek) Nation is a federally recognized Indian Nation with a population of more than 88,000 headquartered in Okmulgee, Oklahoma (Muscogee [Creek] Nation 2016). Other related groups include the Poarch Band of Creek Indians, who are a federally recognized Indian Nation located

in modern Alabama, and four state-recognized tribes: the Cher-O-Creek Intra Tribal Indians, Ma-Chis Lower Creek Indian Tribe of Alabama, the Star Clan of Muscogee Creeks from Alabama, and the Lower Muskogee Creek Tribe of Georgia.

Osage Nation

The people of the Osage Nation are descendants of indigenous peoples hailing from the Ohio River Valley area near present-day Kentucky (Rollings 1995). By approximately 1200 CE, the Osage began migrating west to reach more resource-rich areas and to separate themselves from the invading Iroquois. This migration took the form of small groups traveling along the White River to Arkansas, Missouri, and eastern Oklahoma (Rollings 1995).

The Osage Nation's first interactions with white settlers came around 1673, when the French wrote of Osage settlement near the Osage River in modern western Missouri (Rollings 1995). By 1690, the Osage had adopted the horse (through raiding and trading), which enabled them to attack and defeat other tribes such as the Caddo. Through warfare, the Osage were able to establish dominance across the plains by 1750, and they controlled significant portions of modern Missouri, Arkansas, Oklahoma, and Kansas for nearly 150 years (Rollings 1995).

Due in part to their migratory past, the Osage culture bore elements of both Woodland and Great Plains peoples (Rollings 1995). While the Osage economy was heavily dependent upon hunting and gathering, the Osage people were also skilled agriculturalists with a vast trading network (Burns 1989).

The Spanish government was aware of the Osage by 1750, but was unable to control or dominate the experienced warfaring nation after the transfer of Louisiana from French ownership to Spanish ownership (Burns 1989). In 1804, Lewis and Clark reported groups of Osage along the Osage, Verdigris, and Arkansas Rivers, with a combined population of at least 5,500. The Osage Treaty of 1808 marked the beginning of the Osage's official dealings with the U.S. government and called for a cession of much of the Osage land in Missouri. As a result, the Osage moved from their homelands on the Osage River to western Missouri, with a major portion of the tribe moving to the Three-Forks region of Indian Oklahoma (Burns 1989; Rollings 1995).

Further treaties signed between 1818 and 1825 ceded more traditional Osage lands across Missouri, Arkansas, and Oklahoma in exchange for reservation lands and supplies slated to help the Osage adapt to farming and a more settled culture (Burns 2009). Creek County is included in the lands ceded to the U.S. government in 1825 (Wilson 2009). In the 1830s, the Osage land in present-day Kansas and Oklahoma was promised to the Cherokee and four other tribes. When these tribes arrived to find their promised lands occupied, conflict with the Osage over resources and territory arose. Following these conflicts, the tribe suffered severe losses from the smallpox pandemic of 1837–1838, which affected Native Americans across the U.S. and Canada (Rollings 1995).

After decades of loss, the Osage population recovered, building to a total of 5,000 members by 1850 (Burns 1989). Treaties in 1865 and 1870 called for the cession of the remaining Osage lands in Kansas and relocation of the remaining tribespeople to Indian Territory. That land consisted of approximately 500,000 acres in what is now Osage County and was part of the Cherokee Outlet.

In 1881, the Osage drafted a constitution modelled after the U.S. Constitution, creating the Osage National Council. In 1889, the U.S. government no longer recognized the council's legitimacy and eventually replaced the Osage National Council with the Osage Tribal Council as part of the 1906 Osage Allotment Act (Burns 1989). As part of this legislation, each of the 2,228 registered Osage received 657 acres (compared to the 150-acre allotment typical of other similar treaties). The tribe brought in a sizeable income through grazing leases on their lands. Additionally, the tribe managed to retain mineral rights to subsurface deposits in 1906, which lead to a further proliferation of wealth among the Osage's members (Burns 2009).

Today, the Osage Nation is a federally recognized tribe boasting over 13,300 members, centered around their tribal capital of Pawhuska, Oklahoma (USCB 2013). Roughly 6,700 Osage still live within the state of Oklahoma (Burns 2009).

Otoe-Missouria

Historically two separate tribes, the Otoe and Missouria coalesced as one tribe in the 1800's. Having similar histories, both tribes' ancestors hail from the northern Great Lakes region, relating ancestrally to the Siouan people. Around 1200 CE, the two groups began their migration southwest. By 1250, the Otoe are known to have been established in central Missouri, and the Missouria are known to have resided in Missouri by 1450. Both tribes were part of the Woodland culture, living sedentary lifestyles in earthen lodges, but were also occasionally part of Plains culture, hunting and subsisting on plains flora and fauna. In the 1700s, both tribes began trading with the arriving French, trading mainly bison hides and valuable minerals. By the 1700s, the Otoe emigrated to areas near the Platte River in southeastern Nebraska, and resided there until the late 1800s. In 1819, the two tribes officially formed a combined single nation (May 2009).

In 1880, Otoe-Missouria tribal members were removed from their lands by the United States government and relocated to a reservation in north central Oklahoma. Due to issues of assimilation, several factions briefly splintered from the tribe, but these groups eventually rejoined the tribe on the reservation. By 1904, a majority of the tribal lands had been unjustly taken by white settlers through the Dawes Act of 1887; in reaction the Otoe took up legal action to the Indian Claims Commission (ICC). By 1964, the tribes had won $1.2 million in compensation for their land from the I.C.C. (May 2009, OMT 2017).

Today, the Otoe-Missouria Tribe are a federally recognized tribe, and have had an operative tribal government and constitution since 1984. The tribe consists of 1,500 enrolled members, and the modern tribal headquarters are located within Noble County in the town of Red Rock (May 2009, OMT 2017).

Ponca Tribe of Indians of Oklahoma

The Kaw share lineage with the Ponca as descendants of the Dhegiha-Siouan Hopewell culture group. Several tribes lived together as a larger unit prior to the invasion of white settlers to North America during the late fifteenth century. Prompted by a search for more abundant resources and increasing pressure from the powerful Algonquians to the east, these groups (including the Ponca) emigrated to the Ohio River Valley. During the early 1700s, the Ponca split from the Omaha groups and settled in villages along the Niobrara River and Ponca Creek in modern-day Nebraska and South Dakota. Prior to the arrival of the Teton Sioux around 1750, the Ponca territory spanned the area between the Missouri River and the Black Hills. Disease decimated Ponca populations during the eighteenth and nineteenth centuries, and the Ponca were forced to withdraw to an area near the mouth of the Niobrara River by war-faring Sioux and Lakota bands (van de Logt 2017).

The Ponca were never engaged in an official war with the U.S. government, yet they signed their first peace treaty with the young nation in 1817, resulting in an expanded trade agreement in 1825. After more treaties in 1858 and 1865 ceded Ponca lands to government control, an onslaught of drought, war, and bison population decrease threatened the Ponca with widespread starvation. Compounding the issue, the U.S. government did not uphold their treaty obligations to the Ponca (as was the case with many other tribes). After giving lands reserved for the Ponca to the Sioux in 1868, the government relocated the Ponca to Indian Territory in 1877 (van de Logt 2017).

This removal was handled exceptionally poorly by the U.S. government, and nearly a third of the tribe perished during the Ponca's first years in Oklahoma. Ponca subchief Standing Bear returned to Nebraska with a group of followers, and his resulting arrest led to the landmark *Standing Bear v. Crook* case of 1879. The decision stemming from this trial stated that Indians were recognized as persons under the Fourteenth Amendment, and could therefore sue for their rights. This decision divided the tribe into two bands: the Ponca Tribe of Indians of Oklahoma and the Ponca Tribe of Indians of Nebraska (van de Logt 2017).

In 1911, large oil deposits were discovered on Ponca lands in Oklahoma, but the tribe and its population experienced mixed results from development activities. While some became wealthy because of these mineral deposits, other Ponca were taken advantage of by white settlers and speculators, and many lost their lands. Additionally, the processes of mining, drilling, and oil exploitation quickly created environmental problems for the tribe (van de Logt 2017).

Many Ponca served during World War I, and returning Ponca veterans founded the Buffalo Post 38 chapter of the American Legion. This center was used to revive traditional war dances (such as the *heluska* dance) within their community. Following 1936's Oklahoma Indian Welfare Act, the Ponca tribe reorganized their government, ratified a tribal constitution in 1950, and gained federal recognition. One of the most notable Ponca is Clyde Warrior, an activist who cofounded the National Indian Youth Council in 1961. Warrior called for tribal self-determination and paved the way for a new generation

of Indian activism. Today, the Ponca tribal headquarters are located south of Ponca City in White Eagle, Oklahoma (van de Logt 2017).

United Keetoowah Band of Cherokee Indians in Oklahoma

The United Keetoowah Band (UKB) of Cherokee Indians trace their lineage to the "Old Settler" Cherokees who settled in Arkansas in 1817 and relocated to present-day northeastern Oklahoma in 1828. The arrival of Cherokees from the Trail of Tears sparked a power struggle as the two populations tried to combine; this clash lead to a costly civil war (Clough 2009). This conflict was exacerbated during the American Civil War, when the Keetoowah fought with the Union while the majority of the Cherokee Nation joined with the Confederacy. Roughly 25 percent of the combined Cherokee/UKB population was lost between these two civil wars (Clark 2009). The Keetoowahs adopted a constitution in 1859, calling their newly-formed branch the "Keetoowah Society" (UKB 2011).

After the end of the American Civil War, the Keetoowah Society (which strongly opposed allotment and single statehood) reprimanded the Cherokee National Council for negotiating the reconstruction-era treaty with the United States (Clark 2009). As part of the treaty negotiations, the U.S. government punished tribes for siding with the Confederacy and confiscated large swaths of tribal lands. Oklahoma achieved statehood in 1907, and by 1920 an estimated 90 percent of the Cherokees' land in Oklahoma was taken or sold off to white settlers (Clark 2009). The Cherokee national government was dissolved in 1907, making the Keetoowahs the only federally recognized government of the Cherokee people until 1948. In 1950, the UKB ratified its constitution, bylaws, and corporate charter (Clough 2009).

Today the UKB retains its sovereign, separate government with headquarters located in Tahlequah, Oklahoma. The UKB has over 14,300 members (UKB 2011).

Wichita and Affiliated Tribes

The Wichita and Affiliated Tribes (WAT) includes the Wichita, Tawakoni, Waco, and Kichai (Pool 2018). Ancestors of the Wichita are from the southern plains region of the United States. The villages of the earliest Southern Plains Village tradition (documented Archeologically) were established by A.D. 800; they were located in an area that extended from the Smoky Hill River in Kansas to north-central Texas, thus occupying much of what is today the State of Oklahoma. Archeological evidence suggests that the Wichita were located primarily in the Washita River basin in central and western Oklahoma (WAT 2018).

The Wichita language descends from the Caddoan linguistic family as do the Caddo, Pawnee, and Arkiara languages (Clark 2009). Around 3,000 years ago the Caddoan language group split into the Northern and the Southern types; the Northern group includes Wichita and Pawnee.

Between 1350 and 1450, some Washita River people began to form larger villages featuring circular grass houses and fortifications. These populations traded extensively, and the economy featured

commodities such as glazed, painted pottery; turquoise pendants; shell beads from the Puebloan villages of New Mexico; and *bois d'arc* and engraved pottery from the Caddo people of Texas. The Wichita people comprised a loose confederation of related peoples on the Southern Plains, including groups such as the Tawakoni, Waco, Kichai, and Taovaya (Smith 2000). Each Wichita village was represented by leaders chosen by a warrior-class council, and ceremonial life was largely focused around seasonal economic activity. Dancing ceremonies were performed when the first new grass sprouts appeared; when corn crops ripened; and to ensure or celebrate successful harvests, buffalo hunts, or war parties. (WAT 2018)

Coronado's 1541 expedition encountered Wichita villages when it passed through Kansas, near present day Liberal (Kansas Historical Society 2018; Smith 2000). A later 1601 expedition led by Juan de Oñate crossed through north-central Oklahoma and encountered large villages of grass houses. The Wichita had guns and horses by 1719 when French explorers Jean Baptiste Bénard de La Harpe and Claude Du Tisné established trading posts at Wichita Villages along the Arkansas River in present-day Oklahoma (Pool 2018). These early European inhabitants estimated that the Wichita population was between 15,000 and 33,000 people, with upwards of 2,000 people living in larger villages.

The arrival of Spanish and French settlers and traders sparked massive shifts in Wichita culture. Although the acquisition of horses enabled the Wichita to follow and hunt buffalo more quickly and efficiently over an expanded range, the highly contagious diseases brought by the Europeans decimated local populations (WAT 2018). The Wichita were also harassed by the Osage. This harassment was one of several factors that caused the Wichita to move south toward the Red River. In their new location, the Wichita served as trade mediators between the French and the Spanish. By 1803 the United States gained control of the Wichita lands from the French; by 1830 those lands were designated as part of "Indian Territory."

The Wichita remained north of the Red River throughout the 1800s; during this period, hostilities between the Wichita and other tribes increased as many eastern tribes were forcibly removed to west-central Oklahoma or Indian Territory (Smith 2000). The federal government determined that part of the land the Wichita traveled through and resided on in southeastern Oklahoma belonged to the Osage and Quapaw tribes; nevertheless, the Osage and Quapaw tribes were forced to cede their land to the Cherokee, Choctaw, Muskogee (Creek), and Seminole.

In 1835, the United States–Wichita Treaty was signed at Camp Holmes, which uses "Wichita" to refer to the Wichita, Waco, and Tawakoni people (WAT 2018). The goals of the Camp Holmes Treaty were to recognize the Wichita homeland and to establish peace between the Plains tribes, the United States, and tribes being relocated to Indian Territory (May 2018). The treaty was only briefly successful in achieving those goals. After the Texas Republic was formed in 1836, the Wichita were again forced to defend themselves and their lands against white settlers (Pool 2018).

In 1859, the Wichita were assigned to a reservation near the Washita River. They were joined by some people from the Delaware, Caddo, Tawakoni, and Waco tribes, and by people from two Comanche bands who had been removed from Texas (Pool 2018). Again, peace was short-lived. By 1863, the Wichita people were forced north into Kansas by Confederate troops (WAT 2018). During their time in Kansas, the Wichita were left without farming land or allies, and many tribal members starved. When the Wichita returned to Indian Territory in 1867, their numbers had dwindled to 822. Portions of the 1859 reservation had been assigned under the Treaty of Medicine Lodge to the Kiowa, Comanche, Apache, Cheyenne, and Arapaho. The Wichita protested the assignation of Wichita lands to other tribes. In 1869 a separate agency was created for the WAT. In 1872 the United States recognized the Washita River, Canadian River, 98th Meridian, and 98°40' as the boundaries for the WAT (Pool 2018, WAT 2018). However, this agreement was never ratified.

The 1887 Dawes Act established the "allotment" system of reservations. Each tribal member was given 160 acres and the "surplus" was then opened for white settlers (Pool 2018). The Wichita tribe employed legal counsel to claim the land from the 1859 reservation and the geographic area described in 1872. The Dawes Commission rejected the Wichita land claim, and by 1901 the land had been surveyed and allotted and the "surplus" sold off to white settlers.

The original communal village lifeways of the Wichita, which had endured for centuries, were destroyed by these changes in land ownership. During this time, the Wichita, Tawakoni, and the Kichai were designated as the WAT, although they maintained separate identities for purposes of ration distribution and census records (Pool 2018). By the 1930s, grass lodges had given way to framed houses. As of 2009 the federally recognized Indian Nation of the WAT had 2,501 enrolled members, of which 1,884 resided in the state of Oklahoma (Pool 2018).

Osage County Historic Context

Located in northeastern Oklahoma, Osage County is Oklahoma's largest county. The area has been occupied since the Paleoindian period (detailed above). By 1760, the Osage Nation of Missouri expanded into what is now Osage County but by 1825, had surrendered their claim to the region and were subsequently removed to a Kansas reservation. By 1835, Osage County had been guaranteed to the Cherokee Nation through the Treaty of New Echota. In 1870, 1,570,059 acres of Osage County were purchased from the Cherokee Nation by the Osage Nation, and the Osage Agency was established in present-day Pawhuska in 1872 (May 2019a).

The Osage Nation reservation boundaries were established in 1875 and the reservation was included in Oklahoma territory in 1890, under the Organic Act. The reservation was made semiautonomous by the Enabling Act of 1906 and became Osage County at statehood in 1907. Osage allotment occurred between 1906 and 1909. In subsequent years, land within Osage County was leased out for farming and cattle ranging. Mineral rights within Osage County belong to the Osage Nation, held in trust by the federal government (May 2019a).

Osage County is also the home of the first successful commercial oil well in Oklahoma Territory. The subsequent oil boom, headed by Henry Foster and his family, made life difficult for many Osage. Many Osage were taken advantage of or became the targets of crime, including a string of unsolved murders in the 1920s that received nationwide interest (May 2019a).

Several railroads were constructed crossing Osage County, with the earliest completing construction in 1902. The closest railroad to the APE is the Midland Valley Railroad, which was constructed between 1905 and 1906. All railroads constructed in Osage County between 1902 and 1924 have been abandoned since 2002 (May 2019a).

At statehood, the population of Osage County was 15,332. This number peaked in the 1930s at 47,334 before gradually declining. Another population increase began in the 1980s and as of 2010, the population in Osage County was 44,093 (May 2019a).

The city of Barnsdall was originally called Bigheart, named for Osage Chief James Bigheart, and was officially renamed Barnsdall in 1922. The city was originally established along the Midland Valley Railway in March 1905. The city of Barnsdall was withheld from allotment and was auctioned off in May 1906. The Southwestern Refining Company was constructed in Bigheart around 1910 and was later acquisitioned by Barnsdall Refining Company in 1921 (May 2019b).

Previous Investigations and Previously Identified Resources

A site file review was conducted by Christy Stewart on July 31, 2019 at the Oklahoma Archeological Survey (OAS) to determine the extent of cultural resources surveys that have been conducted in the APE, as well as to identify any previously recorded archeological sites in the area.

According to OAS records, no archeological projects or sites have been recorded within the APE and no archeological sites are located within a 1.6-kilometer (1-mile) study area around the project area. However, two surveys have been conducted within 1 mile of the project area. In 2004, D. Dycus conducted a Phase 1 survey of the current landfill area, which is tangential to the eastern side of the APE, no sites were recorded but one standing structure was assessed. This standing structure is a ca. 1930 Craftsman-style home that was not assessed by Dycus but is still standing and outside of the current project area (Dycus 2004). The second survey was conducted by N. Garrett in 2004 for an oil well under the oversight of the Bureau of Indian Affairs oil well northeast of the project area, no sites were recorded during that survey (Garrett 2004).

No NRHP-eligible resources are located within the project area or within a 1.6-kilometer (1-mile) study area around the project area. However, one NRHP-listed resource is located 1.14 miles (2.25 kilometers) from the southwest edge of the project area. The Old Fort Arbuckle (TU-13) is the site where a fort was constructed in 1833 as an advanced post in the area. On October 22, 1834 troops were ordered to abandon Fort Arbuckle and return to Fort Gibson. No standing features are remaining at this site Excavations at the site by Dr. Annetta L. Cheek in 1977 revealed a portion of a sandstone

alignment and one rock accumulation that were likely part of Fort Arbuckle, and a small scatter of historic artifacts. Since the NRHP status of this site is not dependent upon the integrity of visual lines of sight and since it is located more than one mile away, the current project should have not cause any direct or indirect adverse impact to TU-13.

Map Review

A review of available General Land Office (GLO) maps, historic aerials, topographic maps, and other map resources was undertaken to determine how the study area has been utilized over time; these sources include Google Earth™, the Nationwide Environmental Title Research (NETR) website (NETR 2018), USGS Topographic Map Explorer (USGS 2019b), and Bureau of Land Management (BLM) records (BLM 2019).

Historic topographic maps from the years 1912, 1915, 1955, 1958, and 1990 (USGS 2019b) and aerial imagery from 1957, 1967, 1981, 1995, 2003, 2008, 2010, 2013, and 2015 (NETR 2019), and the 1873 and 1909 GLO survey maps (BLM 2019) were reviewed. According to the GLO survey map from 1873, no buildings were present in the APE. By the 1909 Dependent Resurvey, there are no structures mapped in the APE; however, within one mile of the APE three houses are mapped (BLM 2019).

The earliest topographic maps (1912 and 1915) for the APE do not have any structures mapped into the APE, and both show 10 houses mapped within one mile of the APE. The 1955 topographic map is too large of a scale to see any changes in the APE. By the 1958 topographic map, one house is mapped in the NW ¼ SW ¼ SE ¼ of Section 35 Township 20N Range 10E. Additionally, Anderson Road, which is directly north of the project and N 177th Ave, located directly east of the project area, are present on this map. This house is still extant and appears on all later maps and aerial images. The 1990 topographic map shows no changes to the APE (USGS 2019b).

The earliest aerial imagery from 1957 shows the house in the NW ¼ SW ¼ SE ¼ of Section 35 Township 20N Range 10 East, in addition to an associated outbuilding in the same area; these appear on all subsequent aerials. No major changes are shown on the 1967 aerial other than the thinning of trees in the northern portion of the project area. The 1981 aerials show one new structure in the project area in the NW ¼ NW ¼ NW ¼ of Section 36 Township 20N Range 10E. This seems to be an outbuilding associated with a house outside of the APE, approximately 130 meters (427 feet) northeast of the outbuilding. This structure is present on the 1995 aerial imagery but appears to have collapsed by the 2003 aerial. No changes were noted on the 1995 aerials (NETR 2019).

3 RESEARCH GOALS AND METHODS

Purpose of the Research

The present study was carried out to accomplish the following goals:

1. Identify all historic and prehistoric cultural resources located within the APE defined in Chapter 1
2. Perform a preliminary evaluation of any identified resources' potential for inclusion in the NRHP
3. Make recommendations for further research concerning the identified resources based on the field investigations and background research

NRHP Eligibility

The National Historic Preservation Act of 1966, as amended, provides a statement of federal authority, an administrative framework for agency coordination, and general principles for the assessment of cultural resources, including archeological sites (called "historic properties" in this regulatory context, regardless of actual historic or prehistoric dates), for their eligibility for inclusion in the NRHP (36 CFR 800; 9 TNRC 191; 13 TAC 26.24).

More specific rules relating to the NRHP nomination process, list management, relevant definitions, and other matters are described in 36 CFR 60. Most important to the present investigation are the criteria for significance (and therefore potential NRHP eligibility):

> …The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association and
>
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) that are associated with the lives of persons significant in our past; or
>
> (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) that have yielded or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

Note that significance and NRHP eligibility are determined by two primary components: integrity and one of the four types of association and data potential listed under 36 CFR 60.4(a–d). The criterion most often applied to archeological sites is the last—and arguably the broadest—of the four (36 CFR 60.4[d]).

Survey Methods and Protocols

With the goals and guidelines above in mind, CMEC personnel conducted cultural resource investigations in August and September 2019.

For the archeological survey, 344 shovel tests were excavated within the 277-acre APE. Survey was conducted at transects spaced 30 meters apart, with shovel tests typically excavated at 30-meter intervals along transects. Shovel tests were not excavated in areas with steep slopes (i.e., greater than 20 percent), areas with bedrock or dense gravels at surface, and areas with severe disturbance.

Shovel tests were excavated in arbitrary 10-centimeter or 3.94-inch levels until dense cobbles, gravels, or basal clay was reached. Excavated matrix was screened through 0.635-centimeter (0.25-inch) hardware cloth, and deposits were described using conventional texture classifications and Munsell color designations. All observations were recorded on standard CMEC shovel test forms.

For the built environment historic resources survey, desktop research was conducted to identify parcels containing resources within or immediately adjacent to the APE. Research was also conducted to identify roadway features within or immediately adjacent to the APE. A pedestrian survey was then conducted to verify the location, age, and integrity of these resources, and to identify any other resources not revealed during the desktop review. All surveyed resources are discussed in the results section of this report, and those resources determined to be of historic age were recorded on Oklahoma State Historic Preservation Office (SHPO) Historic Preservation Resource Identification (HPRI) forms. For the purpose of this report, historic-age resources are those constructed prior to 1974. Consistent with SHPO standards, parcels containing historic-age resources are also referred to as building complexes. Furthermore, approximate dates (indicated as “c.”) are within five years of the indicated year. Lastly, parcels were documented only if a historic-age resource was within or immediately adjacent to the APE.

4 RESULTS AND RECOMMENDATIONS

General Field Observations

In August and September of 2019 and February 2020, CMEC personnel performed an archeological and built environment historic resources survey for the proposed American Environmental Landfill expansion in Sand Springs, Osage County, Oklahoma (**Figure 2**). The APE begins 421 meters (1,383 feet) west of the intersection of Anderson Road and North 177th West Avenue approximately 8 kilometers (5 miles) northwest of Sand Springs, covering 277 acres surrounding the north and western portions of the current American Environmental Landfill in Sand Springs.

The northeastern portion of the APE is mostly riparian forest except for the proposed mitigation area, which is grazed pastureland, and the landfill backfill in the southern portion of this area. The APE was steeply sloped at the center and northern portions of the study area and had more gradual hills in the southern and eastern portions of the study area. The southern portion of the APE is crossed by a series of deep and shallow drainages (**Figures 3**, **4**, and **5**). The landfill backfill comprises the excavated material from the landfill. To the west of the backfill area is an existing mitigation pond associated with the current existing backfill area (**Figures 6** and **7**). The northwestern and southwestern portions of the study area are mostly forested, with one pasture located in the far southeastern portion of the study area. Weather during the August and September 2019 survey began with warm and rainy weather, but gradually cleared as fieldwork progressed. The consistent rain at the beginning of the project did raise the water level at the stock ponds in the northern portion of the study area and some creeks in the southern portion of the study area (**Figure 8**). Upon revisit to the northeastern mitigation area, the majority of the project area is covered by stock ponds as well as a disturbed area where fill for the stock pond walls had been excavated.

Survey Results

A thorough pedestrian survey was conducted in areas of slope greater than 20 degrees or where bedrock was present at surface. Pedestrian survey was conducted throughout, with shovel tests in some areas on a 30-meter transect and in other areas judgmentally due to slope, bedrock at surface, and drainages. Pedestrian survey transects were walked in transects no wider than 30 meters, and shovel tests excavated at 30-meter intervals as allowed by sloped, bedrock, and disturbances (**Figure 2**).

Additional disturbances were identified during survey; for example, a two-track gravel road extends from Anderson Road north of the project area to Building 1A (detailed below). Additionally, landfill activities have heavily impacted portions of the project area surrounding the current landfill, including backfill piles (see **Figure 6**) and mitigation ponds (see **Figure 7**). Other disturbances include residential structures and stock ponds.

Due to the slopes and bedrock at surface, several areas were pedestrian surveyed with judgmental shovel tests excavated where possible. This included the northwestern half of the survey area and the western edge of the northeastern portion of the survey area. In these portions of the study area bedrock was present at surface (**Figures 9**, **10**, and **11**). Near the landfill backfill in the northeastern portion of the study area, the terrain was at an approximately 40-degree slope. Further, due to a series of both shallow and deep drainages in the southernmost portion of the APE, field methods had to be adjusted to ensure appropriate coverage (see **Figure 5; Figures 10** and **11**). In the northeastern mitigation area, shovel testing was judgmental because most of the area was covered by a series of stock ponds and disturbed areas from which fill had been excavated for the construction of a raised edge around one of the stock ponds (**Figure 12**).

In total, 344 shovel test units were excavated within the APE. Generally, soil profiles in the APE conformed to mapped soil profiles, with the exception that the southernmost portions of the study area had much deeper soil deposition than expected. Details are provided below.

In the northeastern portion of the study area in the non-sloped areas, soils typically consisted of brown (10YR 5/3) sandy clay loam from 0 to 30 centimeters (0 to 11.8 inches) below ground surface overlaying grayish brown (10YR 5/2) clay from 30 to 50 centimeters (11.8 to 19.7 inches) below surface. Shovel tests in this area were terminated at argillic horizons or compact soils.

Few shovel tests were excavated in the northwestern portion of the study area due to slope and the presence of bedrock at surface; most shovel test units were confined to the northern edge of the study area along Anderson Road. Soils in this area typically consisted of brown (10YR 5/3) sandy loam from 0 to 20 centimeters (0 to 7.8 inches) below ground surface overlaying yellow (10YR 7/8) sandy clay from 20 to 40 centimeters (7.8 to 15.7 inches) below ground surface overlaying sandstone. Shovel tests in this area were terminated at bedrock.

In the southern portion of the study area, shovel tests around the southern drainage consisted of deeper shovel tests. Shovel tests in this area typically consisted of dark yellowish brown (10YR 4/3) sand from 0 to 60 centimeters (0 to 23.6 inches) below ground surface overlaying strong brown (7.5YR 5/8) sandy clay from 60 to 70 centimeters (23.6 to 27.6 inches) below ground surface. Shovel tests were terminated at the argillic horizon.

Ground surface visibility varied widely throughout the study area. Dense woods cover most of the southern and northeastern portions of the study area (**Figure 13**). In the center of the project area, the woods were less dense and hand higher ground surface visibility (**Figure 14**). In the southeastern and edge of the northeastern portion of the study area are two grazed pastures with low ground surface visibility but less dense vegetation (**Figure 15**). Overall, ground surface visibility ranged from 10 percent in the densely vegetated woods to 80 percent in the areas with center of the project area with exposed bedrock.

Isolated Find IF-01

One archeological site (IF-01) was recorded; the site is a stacked rock wall (**Figure 16**). This site is located 643 meters (2,127 feet) southwest of the intersection of Anderson Road and N 177th W. Ave. This site is a stacked rock wall made of locally available rock that spans approximately 7 meters (22 feet) long. At its tallest point, the wall is about 1 meter (3.2 feet) tall and consisted of three courses of rock, generally oriented north-south following the slope. One negative shovel test was dug directly west of the wall, it was mostly sloped bedrock at surface surrounding the wall. Pedestrian survey found no artifacts or buildings associated with the site. Historic maps and aerial imagery do not show houses or buildings near the rock wall. As map and aerial imagery review did not provide information on the age of construction, deed research was undertaken in an attempt to find reference to a residence or occupation. The land was granted by Peter Bigheart to Henry P. Anderson on February 26, 1929 (Allotment Record Vol. 2 Page 281). The property was in the Anderson family's possession for only one year before it was granted to Amasa Warner in 1929 (Warranty Deed Record Vol. 36 Page 336). The property containing the wall was granted to Martin L. Bond in 1938 (Warranty Deed Record Vol. 81 Page 565) and then to Orvill Titus in 1951 (Warranty Deed Vol. 116 Page 13). Orvil Titus granted the property to Lyle L. Enyart in 1952 (Warranty Deed Vol. 116 Page 143); the Enyart family had the land until 2003.

Map and deed research were inconclusive to the age or the wall or its association with an occupation. In addition, the site lacks intact archeological deposits, historic integrity, and/or design distinction or associations with persons of historic significance. Therefore, per the criteria presented in 36CFR60.4 and in accordance with National Register Bulletin 15, CMEC recommends that this site is not eligible for inclusion in the NRHP under Criteria B and D.

Historic-Age Building Complex

One building complex was recorded. Building Complex 1 (Osage County Assessor Parcel ID 35-20-10-00300) is located at the southwest corner of the study area at the end of an unnamed road that meanders south/southwest from Anderson Road north of the project area. The building complex consists of a house (Building 1A; **Figure 17**) and a prefabricated metal shed (Building 1B). The Osage County Assessor website indicates the house was constructed in 1955. The shed was estimated by CMEC to have been constructed circa 1980 and is therefore not historic-age. Although the house appears to have been constructed in the 1950s, its windows, primary door, and roof have been replaced. Its westernmost bay has undergone structural modification, likely a later addition. The building does not display character-defining features of any architectural style.

The documented building complex contains a common house and storage shed; neither has any distinguishing characteristics. No associations were identified linking the complex to events or persons of historic significance and the complex has not been previously evaluated for NRHP eligibility. Building 1A does not embody distinctive characteristics of a type, period, or method of construction, nor does it represent the work of a master or possess high artistic value. Building 1B does not meet the age

requirement for NRHP eligibility, nor does it meet the exceptional significance standard for Criteria Consideration G for resources less than 50 years old. Therefore, these resources are recommended **not eligible** for NRHP listing, either individually or as a part of a historic district (**Table 3**).

Table 3: Historic Age Resources

Resource ID	Date of Construction	Stylistic Influence	NRHP Recommendation
Building Complex 1, off unnamed road in S35 T20N R10E, Sand Springs, OK			
Building 1A/House	1955	None	Not eligible
Building 1B/Shed	c. 1980	None	Not eligible

Figure 2a. Survey Results
American Environmental Landfill,
Sand Springs
Osage County, Oklahoma

Project APE
Negative Shovel Test
Section Line
Pedestrian Survey
Disturbed Area
Landfill disturbance

Data Sources:
CMEC (2019),
OSU CSA (2017)
Aerial Source:
DigitalGlobe (2018)

COX | McLAIN
Environmental Consulting

0 200 Feet
0 60 Meters

1 in = 200 feet
Scale: 1:2,400
Date: 2/25/2020

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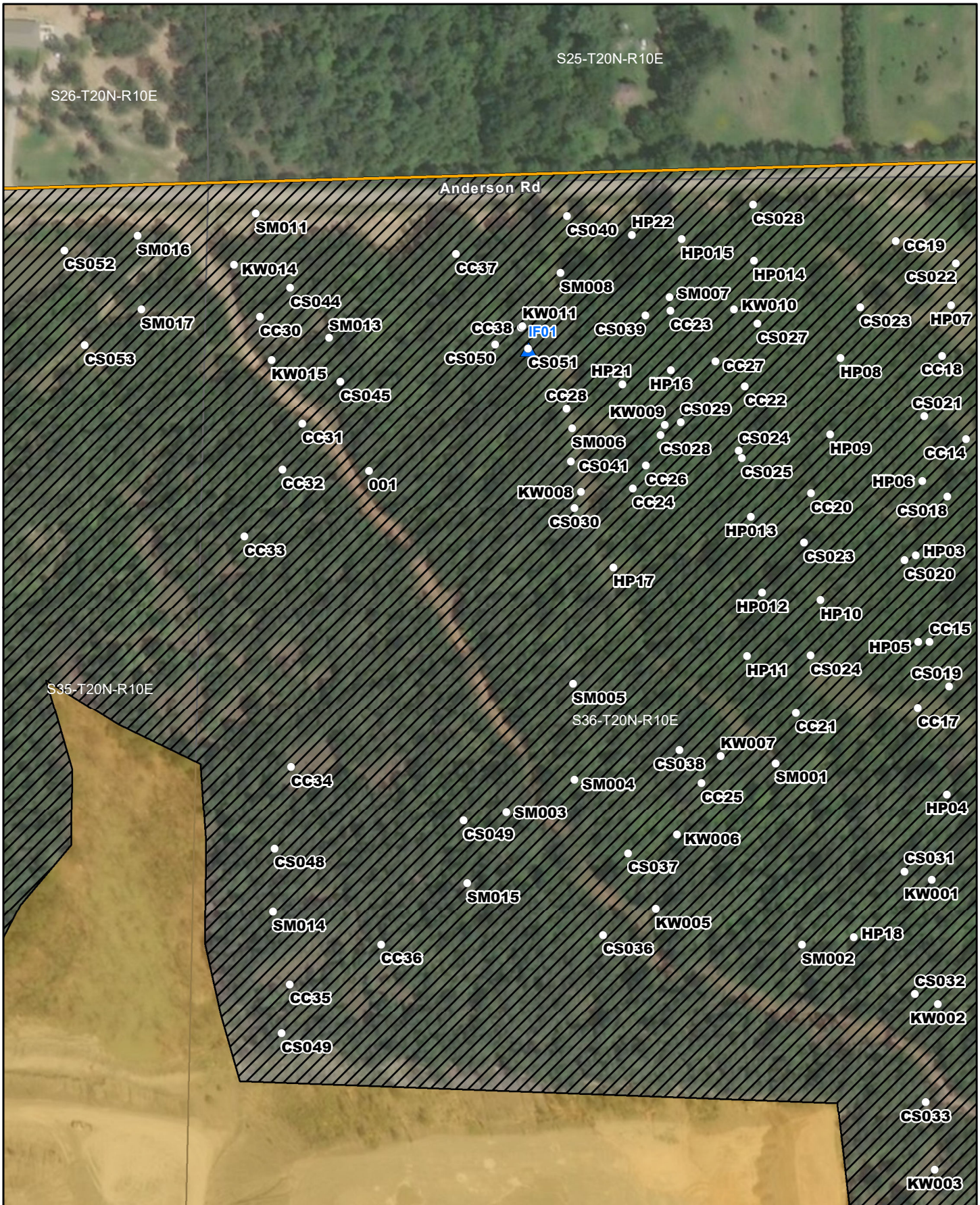

Figure 2b. Survey Results
American Environmental Landfill,
Sand Springs
Osage County, Oklahoma

Project APE
Negative Shovel Test
Isolated Find (IF)
Section Line
Pedestrian Survey
Disturbed Area
Landfill disturbance

Data Sources:
CMEC (2019),
OSU CSA (2017)
Aerial Source:
DigitalGlobe (2018)

COX | McLAIN
Environmental Consulting

0 200 Feet
0 60 Meters

1 in = 200 feet
Scale: 1:2,400
Date: 2/25/2020

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Figure 2c. Survey Results
American Environmental Landfill,
Sand Springs
Osage County, Oklahoma

a b c d e f g h

Project APE
Negative Shovel Test
Section Line
Pedestrian Survey
Disturbed Area
Under water

Data Sources:
CMEC (2019),
OSU CSA (2017)
Aerial Source:
DigitalGlobe (2018)

COX | McLAIN
Environmental Consulting

0 200 Feet
0 60 Meters

1 in = 200 feet
Scale: 1:2,400
Date: 2/25/2020

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Figure 2d. Survey Results
American Environmental Landfill,
Sand Springs
Osage County, Oklahoma

a b c d e f g h

Project APE
Negative Shovel Test
Section Line
Pedestrian Survey

Data Sources:
CMEC (2019),
OSU CSA (2017)
Aerial Source:
DigitalGlobe (2018)

COX | McLAIN
Environmental Consulting

0 200 Feet
0 60 Meters

1 in = 200 feet
Scale: 1:2,400
Date: 2/25/2020

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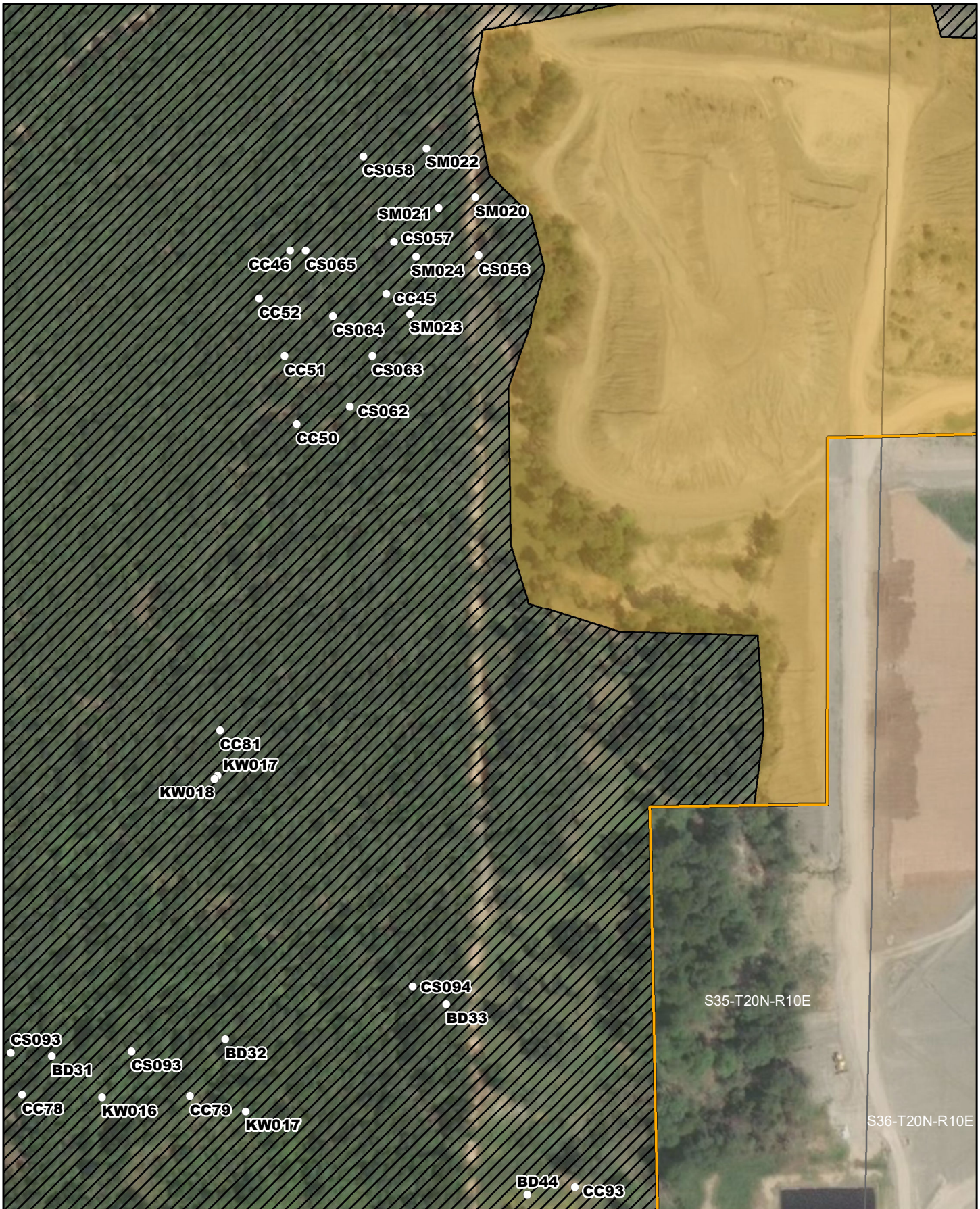

Figure 2e. Survey Results
American Environmental Landfill,
Sand Springs
Osage County, Oklahoma

a b c
d e f
g h

Project APE
Negative Shovel Test
Section Line
Pedestrian Survey
Disturbed Area
Landfill disturbance

Data Sources:
CMEC (2019),
OSU CSA (2017)
Aerial Source:
DigitalGlobe (2018)

COX | McLAIN
Environmental Consulting

0 200 Feet
0 60 Meters

1 in = 200 feet
Scale: 1:2,400
Date: 2/25/2020

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Figure 2f. Survey Results
American Environmental Landfill,
Sand Springs
Osage County, Oklahoma

a b c d e f g h

Project APE
Negative Shovel Test
Section Line
Pedestrian Survey
Disturbed Area
Landfill disturbance

Data Sources:
CMEC (2019),
OSU CSA (2017)
Aerial Source:
DigitalGlobe (2018)

COX | McLAIN
Environmental Consulting

0 200 Feet
0 60 Meters

1 in = 200 feet
Scale: 1:2,400
Date: 2/25/2020

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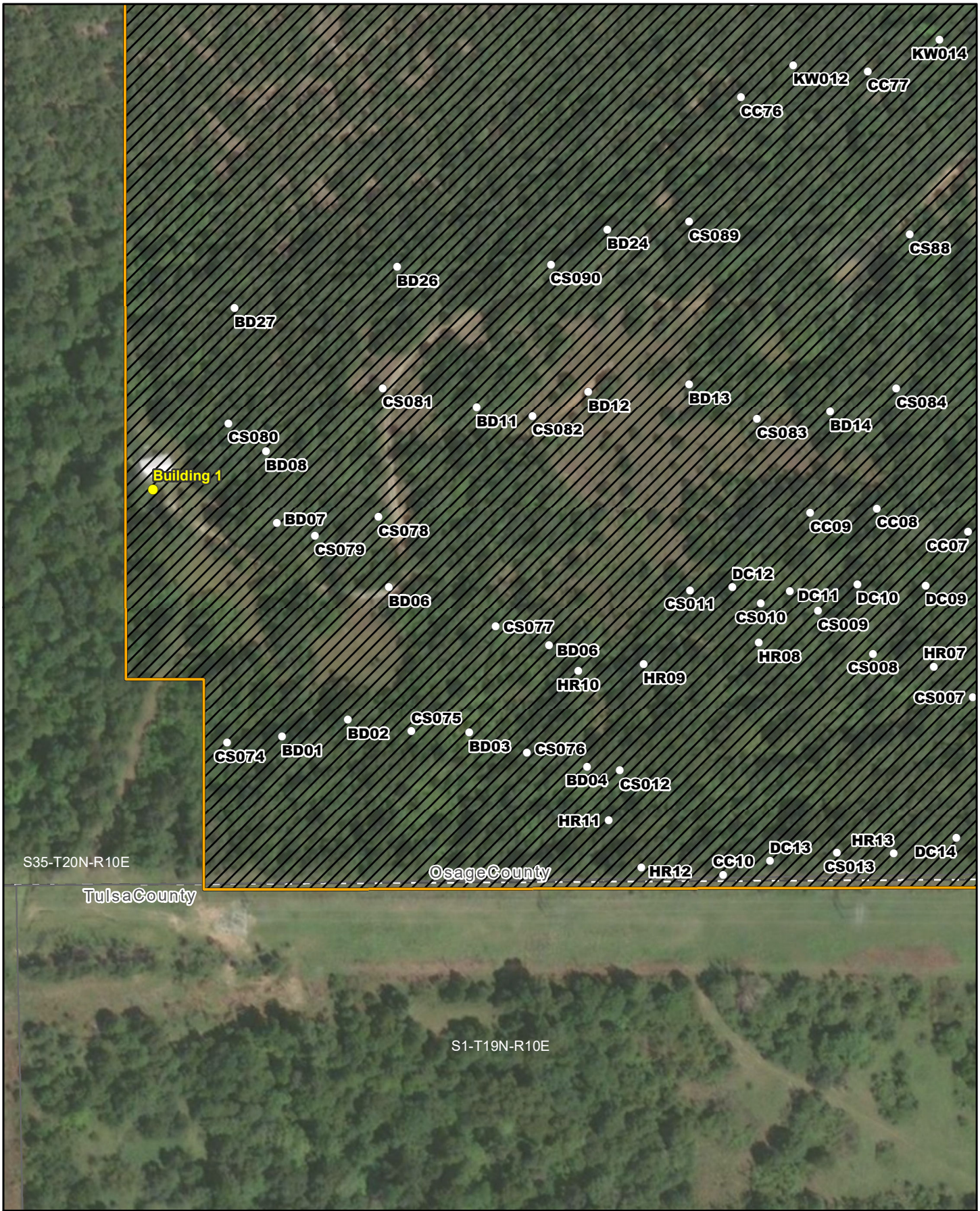

Figure 2g. Survey Results
American Environmental Landfill,
Sand Springs
Osage County, Oklahoma

a b c d e f g h

Project APE
Negative Shovel Test
Section Line
Building
Pedestrian Survey

Data Sources:
CMEC (2019),
OSU CSA (2017)
Aerial Source:
DigitalGlobe (2018)

COX | McLAIN
Environmental Consulting

0 200 Feet
0 60 Meters

1 in = 200 feet
Scale: 1:2,400
Date: 2/25/2020

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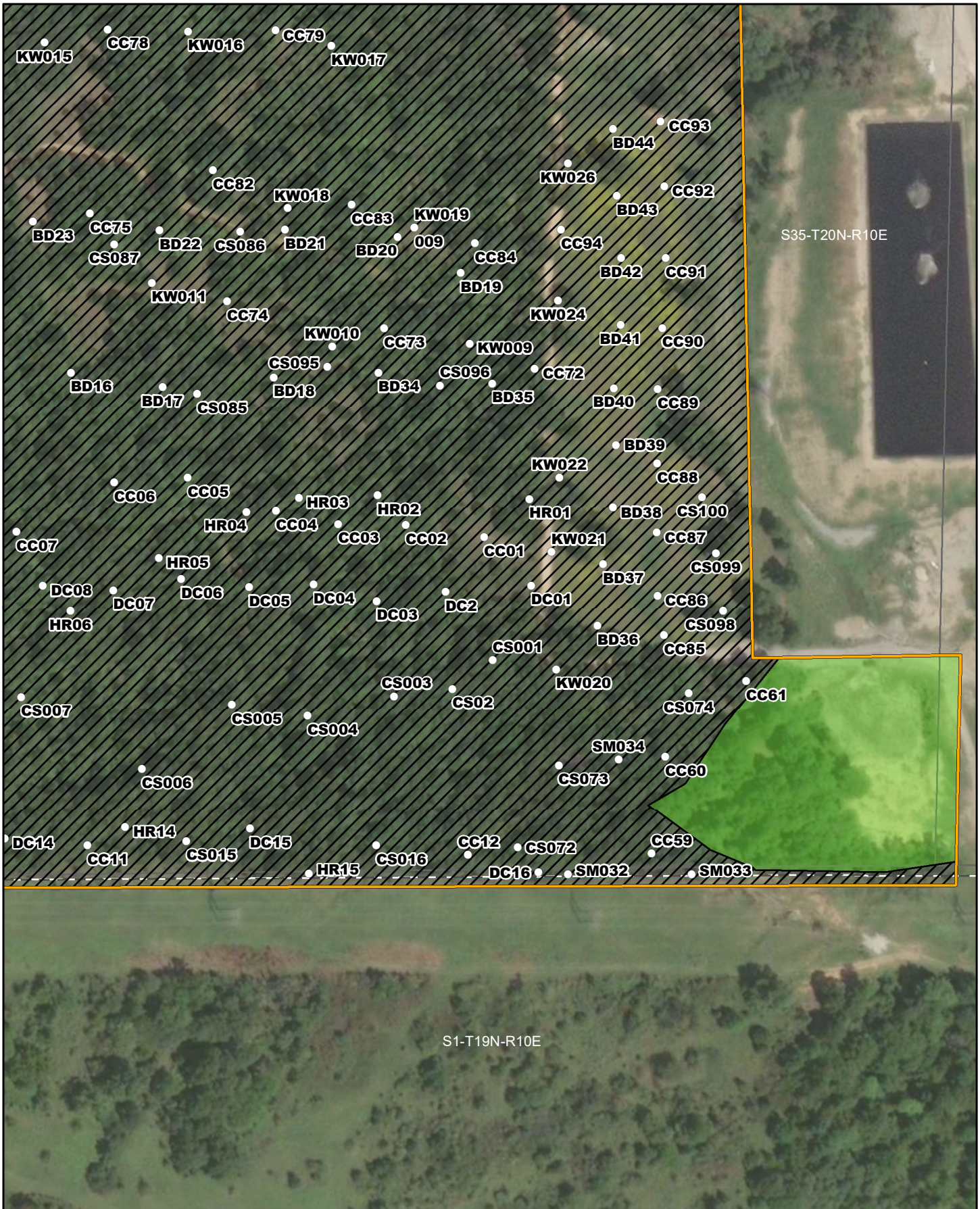

Figure 2h. Survey Results
American Environmental Landfill,
Sand Springs
Osage County, Oklahoma

a b c d e f g h

Project APE
Negative Shovel Test
Section Line
Pedestrian Survey
Disturbed Area
Deep drainages

Data Sources:
CMEC (2019),
OSU CSA (2017)
Aerial Source:
DigitalGlobe (2018)

COX | McLAIN
Environmental Consulting

0 200 Feet
0 60 Meters

1 in = 200 feet
Scale: 1:2,400
Date: 2/25/2020

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Figure 3: Typical drainage in the southern portion of the APE; facing west.

Figure 4. Typical drainage in the center of the APE; facing west.

Figure 5. Southernmost drainage in the APE; facing north.

Figure 6. View of backfill from the current landfill in APE; view to northwest.

Figure 7. Existing mitigation pond to north and west of the landfill backfill; facing south.

Figure 8. Flooded creeks in the southern portion of the APE; facing east.

Figure 9. Bedrock at surface in northern portion of the APE; facing southeast.

Figure 10. Bedrock at surface and rocky slopes in the middle of the APE; facing west.

Figure 11: Bedrock on slopes in the center of the APE; facing north.

Figure 12. A stock pond in the northeastern mitigation area; facing northwest.

Figure 13. Typical vegetation in the southern portion of the APE; facing north.

Figure 14. Typical vegetation in the center portion of the APE; facing west.

Figure 15. Pasture in the southern portion of the APE with the backfill in the background; facing northeast.

Figure 16. Rock wall at IF-01; facing west.

Figure 17. Building 1A; facing west.

Recommendations

Cultural resource specialists from CMEC performed intensive cultural resources investigations of the proposed American Environmental Landfill expansion in Sand Springs, which included an archeological pedestrian survey and the excavation of 344 shovel tests. One archeological site, IF-01, and one historic-age building (Building Complex 1) were documented. None of the resources documented are recommended eligible for listing on the NRHP. It is the recommendation of CMEC staff, that the project could proceed as proposed.

If any unanticipated cultural materials or deposits are found at any stage of the proposed action, the work should cease, and USACE, SHPO, OAS, and/or THPO personnel should be notified immediately. Further work may be required if the following occurs:

- If human remains or burial goods are impacted by construction, post-discovery procedures should be initiated, which includes coordination with the SHPO and OAS, according to the Burial Desecration Law (Oklahoma Statute Title 21 Chapter 47 Section 1168.0–1168.6).
- If the project scope changes, reexamination of the project under Section 106 of the NHPA may be required.

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Oklahoma Tourism and Recreation Department

June 2, 2020
File No. 27219016.00

Ms. Eve Atkinson
Oklahoma Tourism and Recreation Department
900 North Stiles
Oklahoma City, OK 73104

Subject: American Environmental Landfill
Proposed Landfill Expansion Notification
ODEQ Permit No. 3557021

Dear Ms. Atkinson:

As required by Oklahoma Department of Environmental Quality (ODEQ) Oklahoma Administrative Code 252:515-5-31(b), SCS Engineers is requesting a determination for the proposed expansion of the American Environmental Landfill which is owned and operated by American Environmental Landfill, Inc. (AEL). The proposed landfill expansion consists of approximately 203 acres and is located at 207 North 177th West Avenue, Sand Springs, Oklahoma 74063. Two general site location maps are enclosed.

The ODEQ regulation states the following: *no area within the permit boundary of a new solid waste disposal facility, or expansion of the permit boundary of an existing solid waste disposal facility, shall be located within one-half mile of any area formally dedicated and managed for public recreation or natural preservation by a federal, state, or local government agency, unless the appropriate management agency provides a statement that the proposed facility is not expected to adversely affect the existing recreation or natural preservation area.*

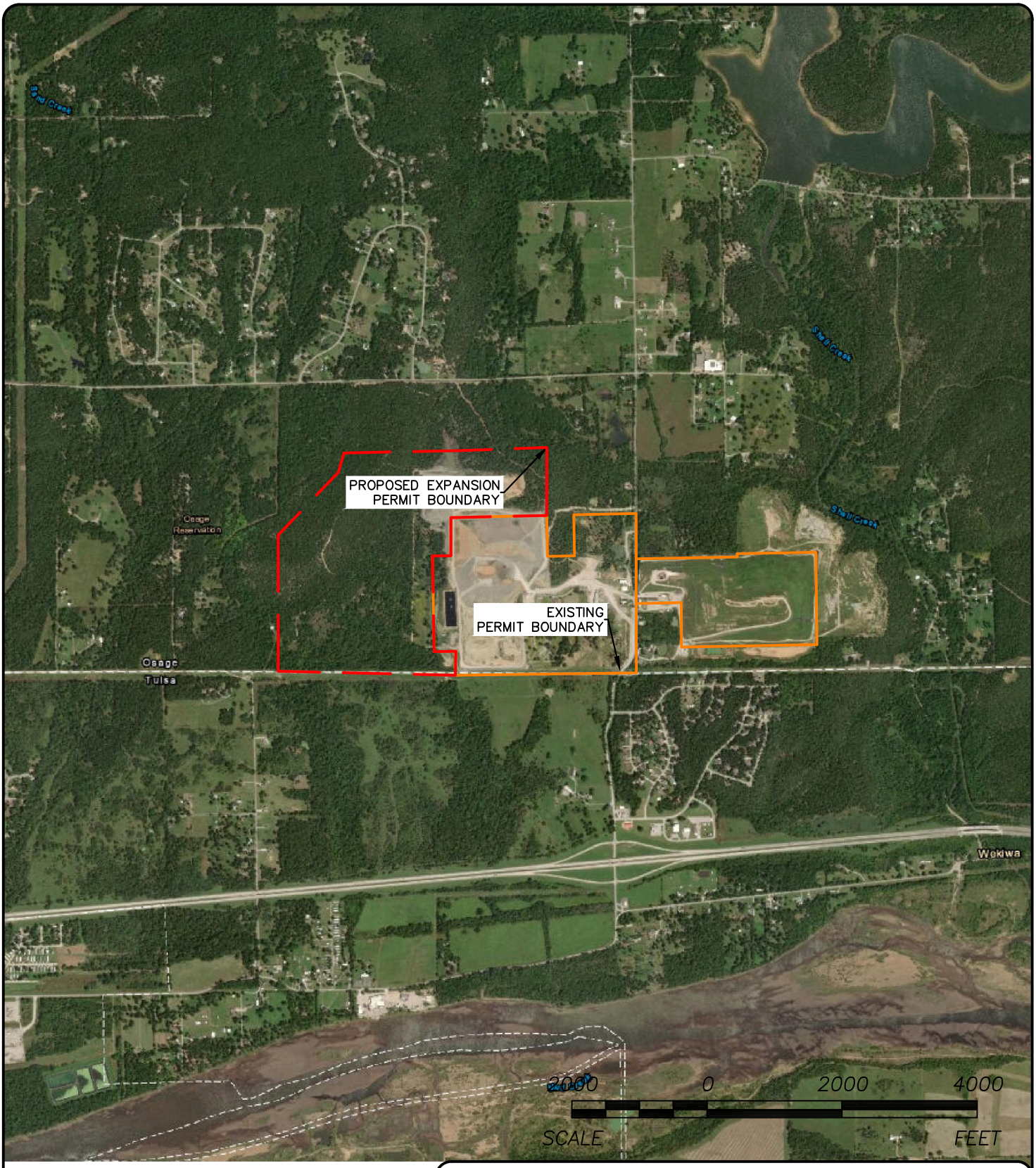
On behalf of our client, we request you review the enclosed maps and provide this determination as required by the ODEQ within 45 days of receipt of this letter. If you have any questions or comments or need additional information, please do not hesitate to contact the undersigned at (405) 246-1574. Thank you very much for your time and effort in this matter.

Sincerely,

Sarah Rafalowski, PE
Senior Project Professional
SCS Engineers

Wade Miller
Project Director
SCS Engineers

Encl. 2 General Site Location Maps



LEGEND

EXISTING PERMIT BOUNDARY

PROPOSED EXPANSION PERMIT BOUNDARY

Aerial Image Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

N

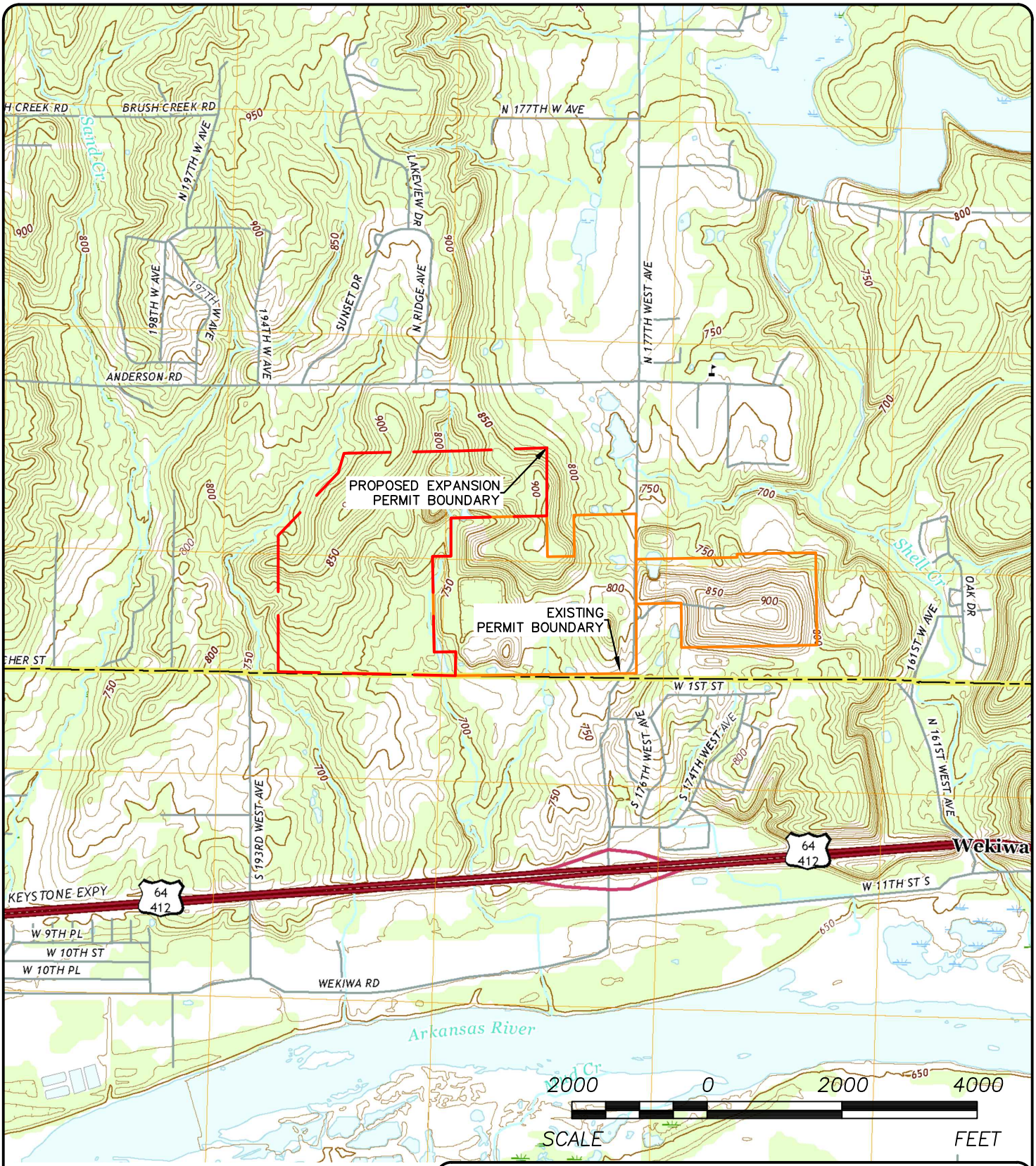
SCS ENGINEERS

STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
1817 COMMONS CIRCLE, SUITE 1
YUKON, OKLAHOMA 73099
PH. (405) 265-3960

AMERICAN ENVIRONMENTAL LANDFILL, INC.

SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/28/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 1



LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED EXPANSION PERMIT BOUNDARY

NOTE:
MAP AND CONTOURS SHOWN ARE FROM THE USGS 7.5' SERIES WEKIWA QUADRANGLE IN OSAGE AND TULSA COUNTIES, OKLAHOMA DATED 2018.

N

SCS ENGINEERS

STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
1817 COMMONS CIRCLE, SUITE 1
YUKON, OKLAHOMA 73099
PH. (405) 265-3960

AMERICAN ENVIRONMENTAL LANDFILL, INC.
SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/26/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 2

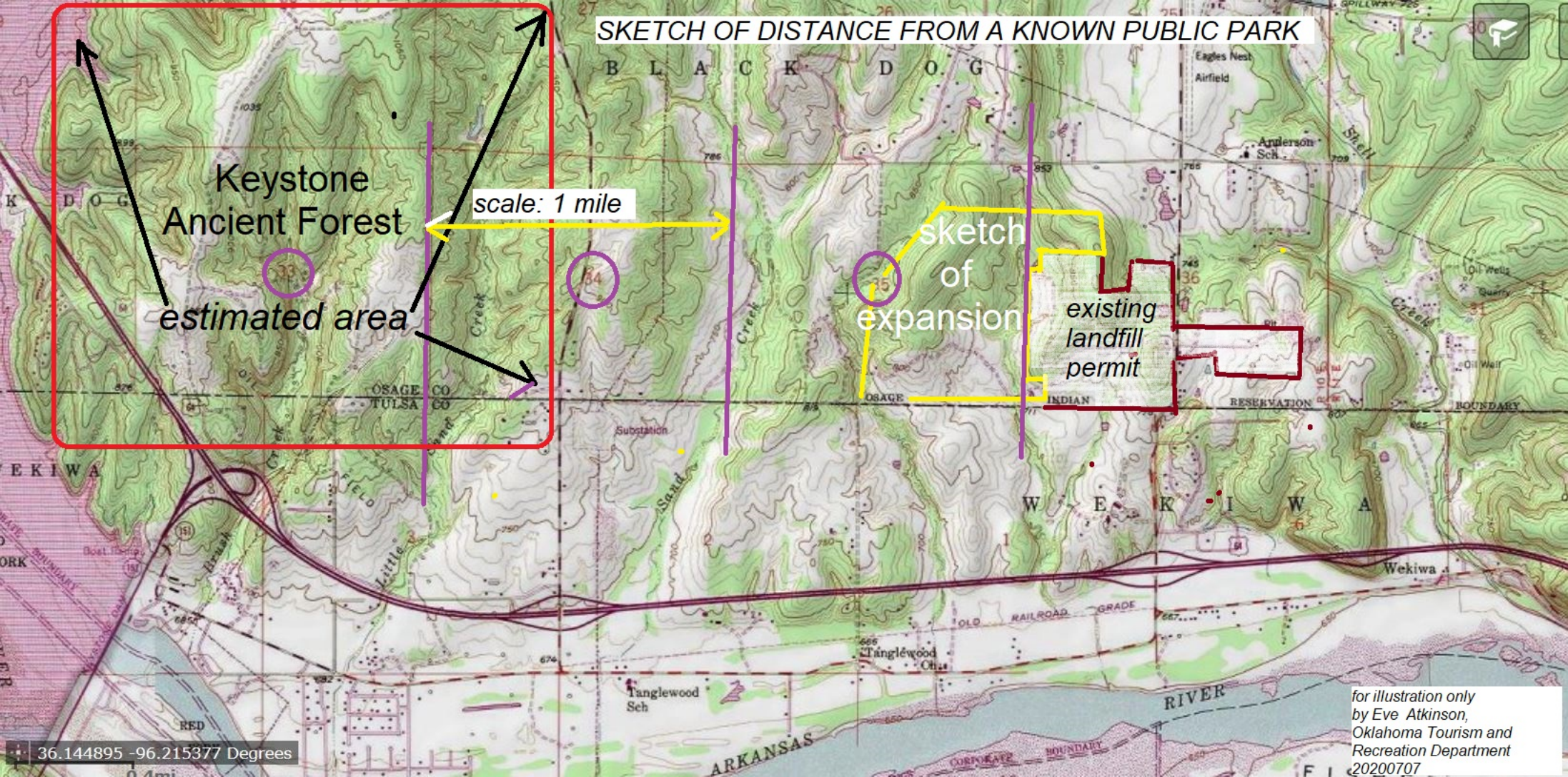
From: Eve Atkinson <Eve.Atkinson@travelok.com>
Sent: Tuesday, July 7, 2020 12:20 PM
To: wmiller@scsengineering.com
Cc: Susan Henry <Susan.Henry@travelok.com>
Subject: Osage County, Sand Springs proposed Landfill expansion, SCS Engineering

Although your proposal is further than ½ mile from a known public park or area with outdoor recreation resources, I am sending a sketch I made to show the distance from The Keystone Ancient Forest, as it does not appear on a USGS map or Google. The last known manager is the City of Sand Springs.

Your project proposal will have no significant adverse impact on any federally funded park or recreation area or state park, regarding the LWCF Act 54 U.S.C. 200305(f)(3) no land may be permanently used for private or non-outdoor recreation purposes (defined by the program).

Thank you for the opportunity to review your proposal.

Eve Atkinson
Planner II
Oklahoma Department of Tourism and Recreation
900 N. Stiles
Oklahoma City, OK 73104
405.522.9516.
Eve.Atkinson@travelok.com *****use this e-mail for rapid communication


SKETCH OF DISTANCE FROM A KNOWN PUBLIC PARK
Keystone
Ancient Forest
estimated area
scale: 1 mile
sketch
of
expansion
existing
landfill
permit
for illustration only
by Eve Atkinson,
Oklahoma Tourism and
Recreation Department
20200707
36.144895 -96.215377 Degrees

United States Department of the Interior – Bureau of Reclamation

June 2, 2020
File No. 27219016.00

Mr. Matt Warren
Bureau of Reclamation
Oklahoma City Field Office
5924 NW 2nd Street, Suite 200
Oklahoma City, OK 73127

Subject: American Environmental Landfill
Proposed Landfill Expansion Notification
ODEQ Permit No. 3557021

Dear Mr. Warren:

As required by Oklahoma Department of Environmental Quality (ODEQ) Oklahoma Administrative Code 252:515-5-31(b), SCS Engineers is requesting a determination for the proposed expansion of the American Environmental Landfill which is owned and operated by American Environmental Landfill, Inc. (AEL). The proposed landfill expansion consists of approximately 203 acres and is located at 207 North 177th West Avenue, Sand Springs, Oklahoma 74063. Two general site location maps are enclosed.

The ODEQ regulation states the following: *no area within the permit boundary of a new solid waste disposal facility, or expansion of the permit boundary of an existing solid waste disposal facility, shall be located within one-half mile of any area formally dedicated and managed for public recreation or natural preservation by a federal, state, or local government agency, unless the appropriate management agency provides a statement that the proposed facility is not expected to adversely affect the existing recreation or natural preservation area.*

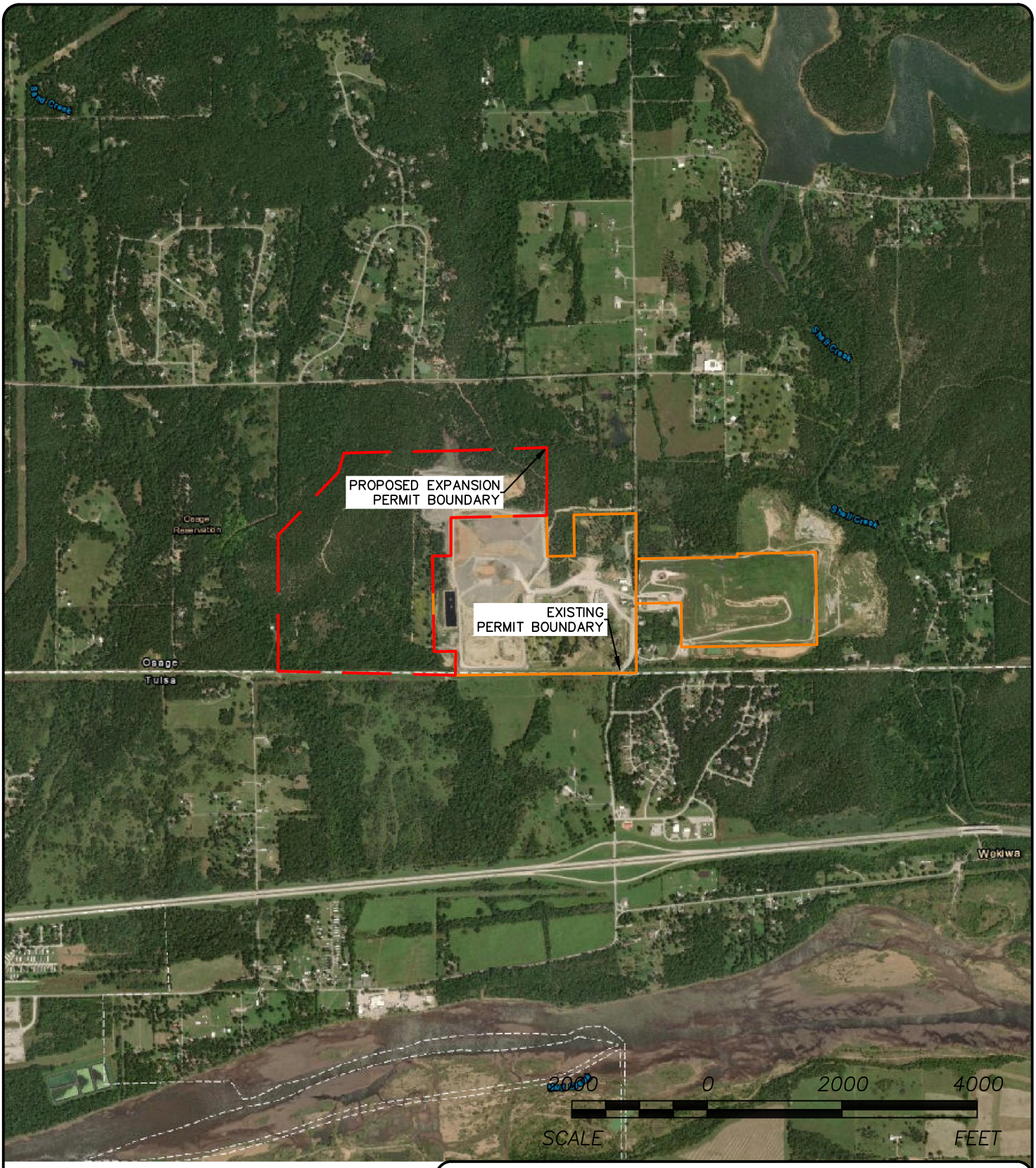
On behalf of our client, we request you review the enclosed maps and provide this determination as required by the ODEQ within 45 days of receipt of this letter. If you have any questions or comments or need additional information, please do not hesitate to contact the undersigned at (405) 246-3960. Thank you very much for your time and effort in this matter.

Sincerely,

Sarah Rafalowski, PE
Senior Project Professional
SCS Engineers

Wade Miller
Project Director
SCS Engineers

Encl. 2 General Site Location Maps



LEGEND

EXISTING PERMIT BOUNDARY

PROPOSED EXPANSION PERMIT BOUNDARY

Aerial Image Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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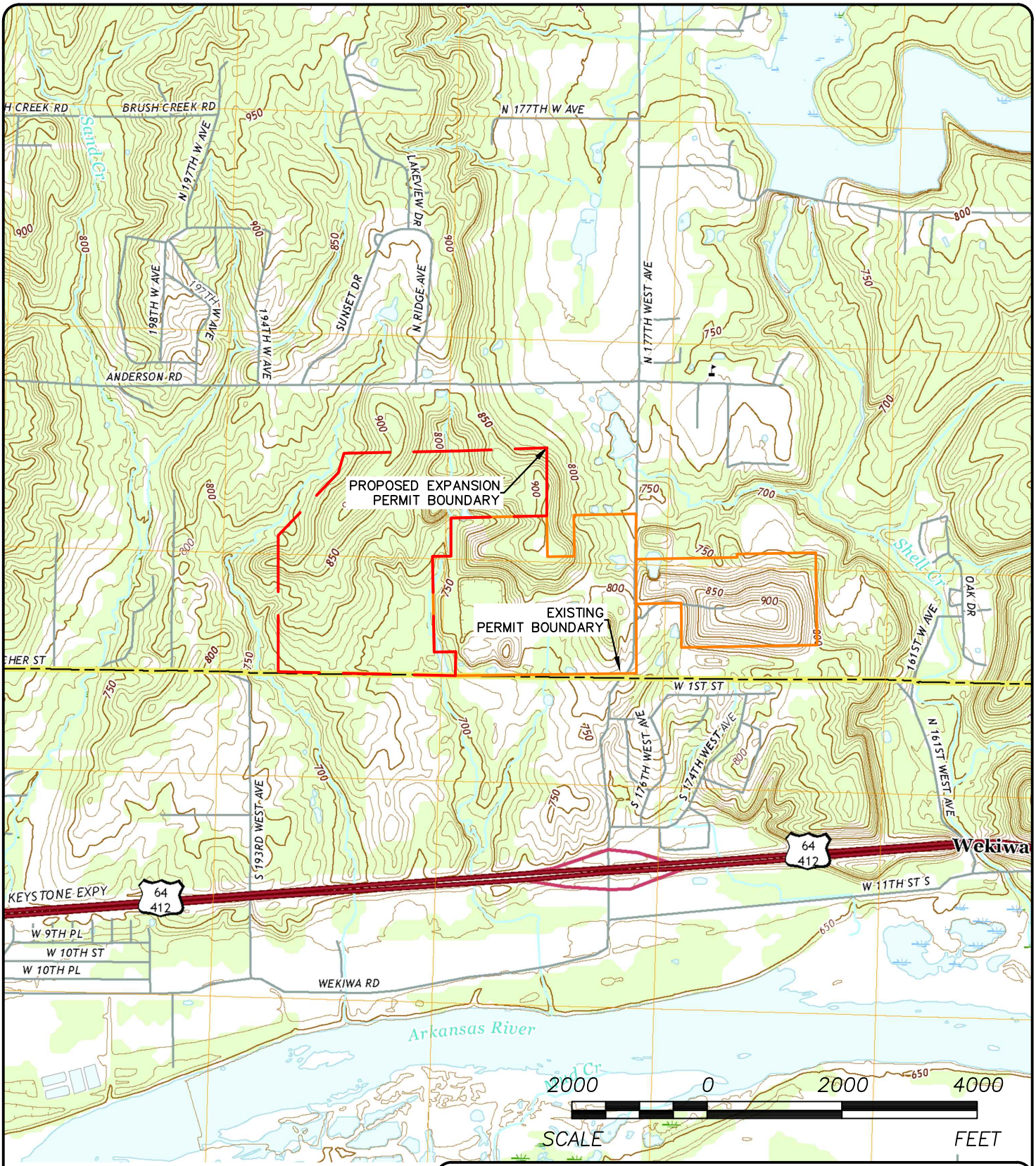
AMERICAN ENVIRONMENTAL LANDFILL, INC.

SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/28/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 1



LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED EXPANSION PERMIT BOUNDARY

NOTE:
MAP AND CONTOURS SHOWN ARE FROM THE USGS 7.5' SERIES WEKIWA QUADRANGLE IN OSAGE AND TULSA COUNTIES, OKLAHOMA DATED 2018.

N

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SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/26/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 2

Oklahoma Department of Wildlife Conservation

April 24, 2019
File No. 27216290.00

Oklahoma Department of Wildlife Conservation (ODWC)
PO Box 53465
Oklahoma City, OK 73152

Subject: AEL Expansion
Osage County Oklahoma

Dear ODWC Project Review Staff:

SCS Engineers (SCS) is submitting this request for project review on behalf of American Environmental Landfill (AEL) for a proposed western expansion of an active landfill located northwest of Sand Springs in Osage County, Oklahoma. The subject site includes approximately 435 acres in Sections 35 and 36, T20N, R10E, near Latitude 36.166643 Longitude -96.203007. See Figure 1 and Figure 2 for a more detailed project boundary.

The State of Oklahoma Solid Waste Permitting requires a consultation with the USACE to determine if jurisdictional waters might be impaired as a result of the proposed expansion. Consultation with the USACE did identify jurisdictional waters and a permit request is being prepared for submission. As part of the USACE permit process, consultations with other agencies is also being initiated. A request for project review has also been submitted to the U.S. Fish and Wildlife Service. This letter is being submitted to initiate consultation with the Oklahoma Department of Wildlife Conservation (ODWC).

SCS conducted a review of publically available resources to evaluate the potential occurrence of state and federally listed Threatened and Endangered Species (TES) within or in close proximity to the proposed expansion project. Although the ODWC county by county lists for TES are not currently available online, a previous search conducted in 2018 indicated state designated TES are not located is Osage County. See the 2018 ODWC species by county list attached. However, there are seven federally listed TES that may occur within the subject site or be impacted by the proposed project including:

- Northern Long-Eared Bat (*Myotis septentrionalis*)
- Least Tern (*Sterna antillarum*)
- Piping Plover (*Charadrius melodus*)
- Red Knot (*Calidris canutus rufa*)
- Whooping Crane (*Grus americana*)
- American Burying Beetle (*Nicrophorus americanus*)
- Rattlesnake-Master Borer Moth (*Papaipema eryngii*)

The USFWS identified three additional species that may utilize the subject site and are protected under the Migratory Bird Treaty Act of 1918 (MBTA) and/or the Bald and Golden Eagle Protection Act of 1940 (BGEPA). These three species include the:

- Bald Eagle (*Haliaeetus leucocephalus*)
- Harris's Sparrow (*Zonotrichia querula*)
- Red-headed Woodpecker (*Melanerpes erythrocephalus*)

See the attached official species list issued by USFWS for the proposed subject on March 27, 2019. Below is a likelihood of occurrence table generated by SCS for the proposed project. The rationale in the Table 1 is based on SCS staff assessments of species listing, habitat requirements, and an onsite field investigation conducted May 24th-25th 2018 to evaluate habitat. In addition, SCS is including a preliminary Habitat Assessment Report generated under separate cover for your reference.

Table 1: Likelihood of TES Occurrence within the Subject Site

Common Name	Federal Listing	Likelihood	Rationale
Northern Long-Eared Bat	Threatened	Possible	Suitable woodland habitat present
American Burying Beetle	Endangered	Likely	Suitable habitat present and subject site is located within the core of this species' population range
Whooping Crane	Endangered	Unlikely	Significant suitable habitat not present
Red Knot	Endangered	Unlikely	Significant suitable habitat not present and species has not been documented in this region in recent years
Piping Plover	Threatened	Unlikely	Significant suitable wetland habitat not present
Least Tern	Endangered	Unlikely	Significant suitable wetland habitat not present
Rattlesnake-Master Borer Moth	Candidate	Possible	Suitable prairie and woodland habitat present
Bald Eagle	MBTA and BGEPA	Possible	Significant suitable habitat not present, but occurs in large numbers at Keystone lake located 2.5 miles west of subject site and documented occurrence in vicinity of subject site

Common Name	Federal Listing	Likelihood	Rationale
Harris's Sparrow	MBTA	Likely	Documented occurrences in vicinity and suitable habitat present
Red-headed woodpecker	MBTA	Likely	Documented occurrences in vicinity and suitable habitat present

Species specific surveys have not been conducted for the proposed project. Construction for the expansion project is uncertain, but anticipated within 12-24 months of this request for project review pending USACE and all other agency permits and approvals.

We appreciate your review of the proposed project and request ODWC guidance to avoid and minimize impacts to TES or other sensitive species potentially located within or in close proximity to the subject site.

Sincerely,

Vaughn Weaver
Senior Project Professional
SCS Engineers

cc: Wade Miller

Encl. TES Habitat Assessment Report.

Threatened and Endangered Species (TES) Habitat Assessment Report

AEL's Proposed Expansion
Section 35 and 36, Township 20 South
Range 10 East
Osage County, Oklahoma

American Environmental Landfill
207 North 177th West Avenue
Sand Springs, Oklahoma
(918) 245-7786

SCS ENGINEERS

27216290.00 | July 3, 2018
Revised April 1, 2019

1817 Commons Circle, Suite 1
Yukon, Oklahoma 73099
(405) 265 3960

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Appendix A Figure 1 - AEL Subject Site Location
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Appendix B USFWS Official Species List
USFWS IPAC Resource List
ODWC County by County List of Endangered and Threatened Species

1.0 EXECUTIVE SUMMARY

SCS Engineers (SCS) has contracted with American Environmental Landfill (AEL) to complete a threatened and endangered species (TES) habitat assessment for a proposed western expansion of an active landfill located northwest of Sand Springs, Osage County, Oklahoma. AEL is in the planning stage of expanding their operations by constructing future cells west of their current landfill. The proposed expansion (subject site) would include the purchase and permitting of land adjacent to their western property boundary. The purpose of the TES habitat assessment is to evaluate the potential presence of state and/or federally listed TES and their associated habitats within the subject site and help determine if potential impacts to protected species may occur as a result of the proposed expansion development.

The following species were identified by the United States Fish and Wildlife Service (USFWS) as potentially occurring within or near the subject site:

- Northern Long-Eared Bat (*Myotis septentrionalis*)
- Least Tern (*Sterna antillarum*)
- Piping Plover (*Charadrius melodus*)
- Red Knot (*Calidris canutus rufa*)
- Whooping Crane (*Grus americana*)
- American Burying Beetle (*Nicrophorus americanus*)
- Rattlesnake-Master Borer Moth (*Papaipema eryngii*)

A review of bird species that are protected under the Migratory Bird Treaty Act of 1918 (MBTA) and the Bald and Golden Eagle Protection Act of 1940 (BGEPA) identified three additional species that are a conservation priority and may utilize the habitat within the subject site. These three species include the:

- Bald Eagle (*Haliaeetus leucocephalus*)
- Harris's Sparrow (*Zonotrichia querula*)
- Red-headed Woodpecker (*Melanerpes erythrocephalus*)

A desktop review was performed to evaluate the potential presence of state or federally listed TES and their habitats within the subject site. An on-site field investigation was completed May 24th - 25th, 2018 to verify if suitable habitat was present for TES within the subject site. Potential suitable habitat was observed within the subject site for three TES species including:

- Northern long-eared bat,
- American burying beetle (ABB)
- Rattlesnake-master borer moth

In addition, suitable habitat for all three MBTA/BGEPA listed species was observed within the subject site.

2.0 PROJECT OVERVIEW/INTRODUCTION

The State of Oklahoma solid waste permitting process requires that consultation with the United States Army Corp of Engineers (USACE) be completed prior to state approval. Clearance from the USFWS is also required for projects on federal lands, federally funded projects, and projects that require federal permits or approvals including prior approval for any USACE 404/401 permit. A wetland determination report for the subject site has been completed under a separate cover, which will help determine if impacts to Waters of the United States (WOUS) may occur as a result of the proposed.

This document provides information that aids in compliance with Section 7(a) of the Federal Endangered Species Act (ESA) and the Oklahoma Endangered Species Statute. These regulations are enforced by the USFWS and the Oklahoma Department of Wildlife Conservation (ODWC), respectively.

The following report discusses the findings and conclusions of a background published documentation review and an onsite field inspection for potential impacts to TES and their associated habitats within the proposed subject site.

3.0 SCOPE

3.1 PUBLISHED DOCUMENTATION REVIEW

A review of publically available information including USFWS Information for Planning and Consultation (IPAC) records, an official species list from the USFWS, ODWC TES list by county, aerial imagery, National Wetlands Inventory (NWI) maps, United States Geological Survey (USGS) topographic maps, and USGS Land Cover Data were reviewed to evaluate the potential presence of state or federally listed TES and their associated habitats within or adjacent to the subject site.

3.2 FIELD PROCEDURES

SCS Engineers conducted an onsite field investigation to determine if suitable habitat for state or federally listed TES is located within the subject site. A literature review of TES and their habitat preferences was completed prior to staff's field visit. Field investigation was conducted May 24th – May 25th, 2018 in concurrence with a preliminary wetland determination that has been summarized in a report being submitted under separate cover. In addition, an updated literature review was completed in March 2019 to supplement AEL's formal request to the USFWS for a project review.

SCS staff traversed the subject site from the north to the south to assess the different types of habitats, land features, vegetative cover, and soil features potentially suitable for the identified TES; existing habitats were assessed to determine if the area could be used by one or more of the identified TES. To maximize coverage of the heavily wooded areas with limited visibility, SCS staff dispersed and traversed up and down slopes. Habitats were qualified but not quantified for TES use. As this was a preliminary assessment of potential habitats, determination if potentially usable habitat by TES was the primary concern. The different observed habitats are discussed in more detail below.

4.0 PROJECT LOCATION AND SITE DESCRIPTION

The subject site includes approximately 435 acres located northwest of the City of Sand Springs, just southwest of the intersection of North 177th W. Avenue and Anderson Road in Osage County, Oklahoma. The subject site is located in Sections 35 and 36, T20N, R10E near Latitude 36.166643, Longitude -96.203007 **(Appendix A, Figure 1)**. The vegetative cover is predominantly mature oak/hickory woodlands with a native grass understory on steep sloping hills. Two drainage ways transect the subject site from north to the south

The subject site is located within the Northern Cross Timbers (Level 4 Ecoregion) of the Cross Timbers (Level 3 Ecoregion) of Oklahoma (Woods, 2005). This region includes a mosaic of oak savanna, scrubby oak forest, and tall grass prairie, which naturally cover the hills, cuestas, and ridges. Tall grass prairie occurs on fine-textured soils derived from limestone or shale. Soils are highly erodible when disturbed. There are two common stream types. A mixture of shaded riffles, runs, and pools that have gravel or cobble substrates characterizes the first. The second stream type has lower gradients and is typically found downstream of the first, it is characterized by wide, shallow, sand-choked channels. Uplands are mantled by Quaternary clayey silt-to-silt clay decomposition residuum, and sandy decomposition residuum. Valleys are veneered with Quaternary alluvium. The area is underlain by Pennsylvanian and Permian-age sandstone, shale, and limestone. Rock outcrops occur where sandstone blocks and boulders often litter hilltops and slopes. Soils consist of sandy and clayey residuum and colluvium overlaying Pennsylvanian sandstone, limestone and shale. The common soil series for uplands in this region include Darnell, Stephenville, Niotaze, Steedman, Coweta, Dennis, Bates, Clarita, Durant, Shidler, Newalla, Harrah, Chigley, and Konawa. The common soil series for floodplains include Verdigris, Port, Pulaski, and Garvin. Native vegetation is a combination of oak-hickory woodland and tallgrass prairie. Woodland areas are dominated by post oak (*Quercus stellate*), and blackjack oak (*Q. marilandica*) while tall grass prairie is dominated by big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*) and Indiangrass (*Sorghastrum nutans*). Current land cover is woodland, grassland, rangeland, pastureland, and limited cropland. The main crops in this region include small grains, grain sorghum, hay and soybeans.

5.0 PUBLISHED DOCUMENTATION REVIEW

A desktop review was performed utilizing USFWS IPAC records, an official USFWS species list, ODWC TES lists by county **(Appendix B),** aerial photographs **(Appendix A, Figure 2)**, National Wetland Inventory (NWI) maps, USGS Topographic maps **(Appendix A, Figure 3)**, and USGS Land Cover Data. These resources were reviewed for the subject site to evaluate the potential presence of state and/or federally listed TES and their habitats within the subject site.

5.1 USFWS IPAC

A review of USFWS IPAC data (2011a) was conducted for the project site to determine the level of potential impacts to TES and their associated habitats **(Appendix B)**. In addition to the preliminary IPAC review, SCS received an official USFWS species list for the proposed project dated March 27, 2019 included in **Appendix B.** TES are protected by federal and state regulations to prevent further decline or extinction of these species. For species that may have the potential to receive impacts from the proposed development, considerations in the planning phase should evaluate ways to avoid, minimize and/or mitigate these potential impacts.

5.1.1 SPECIES LIST

The following species were identified by the USFWS official list as potentially occurring within or near the proposed subject site:

- Northern Long-Eared Bat (*Myotis septentrionalis*)
- Least Tern (*Sterna antillarum*)
- Piping Plover (*Charadrius melodus*)
- Red Knot (*Calidris canutus rufa*)
- Whooping Crane (*Grus americana*)
- American Burying Beetle (*Nicrophorus americanus*)
- Rattlesnake-Master Borer Moth (*Papaipema eryngii*)

The following information provides a description of each species and its habitat requirements.

Northern Long-Eared Bat

The northern long-eared bat is federally listed as threatened. This medium sized bat typically hibernates in caves/rock crevices during the winter months then migrates to wooded areas in the summer where they roost and breed in mature, live trees and snags (NatureServe 2017; USFWS n.d.). This bat species occurs throughout portions of the Ozark highlands and Ouachita Mountains regions of eastern Oklahoma located approximately 50 miles east and 85 miles northwest of the subject site, respectively; there are nine known northern long-eared bat hibernacula with multiple individuals documented at additional cave locations in Oklahoma (ODWC 2017). Specific summer roosting habitat in Oklahoma is generally unknown, but this bat uses a variety of different tree species and frequently switch roosts (every 2-3 days) (ODWC 2017). Northern long-eared bats feed by flying through the understory of forested areas to glean insects from the surfaces of leaves and water. Reproductive females typically give birth to one pup each year/summer and gather in maternity colonies that vary from fewer than five individuals to more than fifty bats. Males and non-reproductive females use both trees and caves as roosts during the summer (ODWC 2017). White nose syndrome

is currently a predominant threat to this species. The northern long-eared bat is dependent on forested areas for summer roosting and foraging, therefore, loss and fragmentation of wooded areas during the summer months could affect this species. The northern long-eared bat may occur within the subject site due to the availability of suitable woodland habitat (e.g. mature canopy with an open understory) and insect/prey.

American Burying Beetle

The American burying beetle (ABB) is federally listed as endangered and is the largest carrion beetle in North America (USFWS 2014b). Historically this species could be found in 35 states but is currently limited to nine states including: Arkansas, Kansas, Massachusetts, Nebraska, Oklahoma, Ohio, Rhode Island, and South Dakota (Ratcliff 1996; USFWS n.d.). The largest populations of ABB are found in Oklahoma where it is currently known to occur in at least 29 counties in the eastern portion of the state (ODWC 2017). This beetle is dependent on small carrion (between 3-7ounces) to feed and reproduce (ODWC 2017). There is no critical habitat designation for this species, but the highest densities of ABB occur in open, oak-hickory forests with native grass cover; populations also occur in both closed-canopy forest and tallgrass prairie habitats. Preferred habitat for the ABB includes areas with loose soils and minimal human disturbance. This species has a short life span of approximately one year. The ABB is dormant (underground) in the winter when temperatures are less than 60 degrees Fahrenheit (˚F). During summer months, the adults are nocturnal and require a minimum nighttime air temperature of 60 ˚F for activity. Eggs are laid between April and September but predominantly in June and July and larvae require 48-60 days to develop (Ratcliff 1996). This species can travel up to two miles in a night and can occur in many undeveloped areas if the food opportunity is present. Soil disturbance from construction projects occurring during the cool/cold weather months are a concern for this species survivability. Based on the known current and historic range for this species, suitable soil conditions, and its ability to travel long distances, this species may occur within and/or adjacent to the subject site.

Whooping Crane

The Whooping Crane is a federally listed endangered species that occurs only in North America. It is North America's tallest bird, with males approaching 5 feet tall when standing erect (USFWS 2011c). The whooping crane adult plumage is snowy white except for black primary feathers, black or grayish alula (specialized feathers attached to the upper leading end of the wing), sparse black bristly feathers on the carmine crown and malar region (side of the head from the bill to the angle of the jaw), and a dark gray-black wedge-shaped patch on the nape (USFWS 2011c). Whooping Cranes are typically found in wetlands, marshes, pond and lake shorelines, shallow rivers, wet prairies, and crop fields near wetlands where they eat a varied diet of insects, crayfish, fish and seeds (ODWC 2011). Although rare, whooping cranes migrate through Oklahoma each spring and fall from their wintering grounds along the Texas Coast to their summer breeding grounds in Canada. The Salt Plains National Wildlife Refuge, located approximately 115 miles northwest of the subject site, is a valuable migration stopover area and is designated critical habitat for this species. The whooping crane is not likely to occur within the subject site due to the lack of suitable wetland or cropland habitat for feeding and loafing.

Red Knot

The Red Knot is a federally threatened species. It is the largest and most colorful of the North American peeps and has the longest yearly migratory route of any North American shore bird (Cornell 2015). This species can migrate from the southern tip of South America (Chile) to the Northern artic regions of North America. This species breeds in the dry, sparsely vegetated tundras of the North American Arctic. Outside of the breeding season, the red knot is found primarily in intertidal and marine habitats. With fewer than five birds reported annually, Oklahoma is not a critical breeding or

staging area for the species (ODWC 2017). The red knot is unlikely to occur within the subject site due to the lack of suitable habitat including marine shoreline and has an infrequent occurrence in the state.

Piping Plover

A federally listed threatened species the Piping Plover is a small shorebird that utilizes open, sand bars, mudflats, salt flats, and shallow wetlands for feeding and nesting (ODWC 2017; USFWS 2011b). Once widespread, this species is currently listed as threatened or endangered throughout its range. The Northern Great Plains population, which includes the Oklahoma population, is currently listed as federally threatened (USFWS 2011a, 2016a). The piping plover is a common spring and fall migrant through Oklahoma including Osage County (USFWS 2017), but there is only one nesting record for this species located in the panhandle of the state (ODWC 2017). Migration for this species in Oklahoma typically occurs from March through May and July through September. This shorebird is unlikely to occur within the subject site due to lack of suitable wetland or shallow riverine habitat with suitable sand/gravel bars for feeding or nesting.

Least Tern

A federally endangered species the least tern is the smallest North American shorebird. This species utilizes large river sandbars, saline flats, and marshes for feeding and nesting (USFWS n.d.). Least terns nest in colonies with peak egg laying from May-June and a completed breeding season by August. For feeding, least terns utilize shallow water areas of lakes, ponds, and rivers typically located close to the nesting areas. Nesting colonies are known from the Salt Plains National Wildlife Refuge in Oklahoma located more than 100 miles northwest of the subject site (ODWC 2017). Although this species is a known migrant in Oklahoma, this shorebird is unlikely to occur within the subject site due to the lack of suitable wetland and/riverine habitat. The thick woodland area and the lack of suitable gravel at the subject site limits this species preferred nesting and migratory habitat stop-overs. The available wetland features would not support the preferred food for offspring or adults due to the lack of extended inundation periods.

Rattlesnake-Master Borer Moth

The Rattlesnake-master borer moth is currently a candidate species for federal listing under the ESA. The candidate designation does not afford this species statutory protection, but candidate species are closely monitored as a conservation priority that may warrant future protection. This moth gets its name from the rattlesnake master plant (*Eryngium yuccifolium*); an herbaceous perennial that occurs in rocky woods, prairies and glades which is host to the moth's larvae. The rattlesnake-master borer moth may be present onsite depending upon the prevalence of the host plant on the subject site.

5.1.2 CRITICAL HAITAT DESIGNATION

Critical Habitat is federally designated and carries legal implications under the ESA. Critical habitats are specific geographic areas with features that are essential to the conservation of TES and may require additional management and protection. A review of state and federally designated critical habitats was conducted for the proposed subject site. Designated critical habitats are not located within the proposed subject site (ODWC 2016b; USFWS 2019).

5.1.3 MIGRATORY BIRDS

Migratory birds are afforded federal protection under the Migratory Bird Treaty Act of 1918 (MBTA) and the Bald and Golden Eagle Protection Act of 1940 (BGEPA). The USFWS has statutory authority and responsibility for enforcing the MBTA and BGEPA. Both acts make it illegal for anyone to take,

possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird/eagle, or the parts, nests, or eggs of such birds except under the terms of a valid permit issued pursuant to federal regulations (USFWS 2016a, 2017). Activities that may result in impacts to migratory birds, eagles and their habitats would need to follow appropriate protection regulations and implement appropriate conservation measures to minimize impacts to these species. Additional permitting may be required for any project that has the potential to disturb migratory birds/eagles. The following MBTA/BGEPA birds are identified by the USFWS IPAC tool as potentially being within or near the proposed expansions:

- Bald Eagle (*Haliaeetus leucocephalus*)
- Harris's Sparrow (*Zonotrichia querula*)
- Red-headed Woodpecker (*Melanerpes erythrocephalus*)

The following information provides a description of each species and its habitat requirements.

Bald Eagle

Although the bald eagle has been removed from the TES list, under the ESA, this species continues to be protected by the MBTA and the BGEPA. Bald Eagles typically breed and winter in forested areas adjacent to large bodies of water. This species often selects large/mature trees that are open and accessible for roosting and nesting. The Bald Eagle is an opportunistic forager that may travel up to 50 miles in search of carrion, fish, bird, and mammalian prey. Some major threats to Bald Eagles include degradation of shoreline habitat, and disturbance at nest and roost sites. Eagles typically winter in Oklahoma from November through the end of March and are a common sight at large lakes and reservoirs including Kaw, Keystone, Texoma, Tenkiller, Ft. Gibson, Grand, Canton, Great Salt Plains, Tishomingo and Spavinaw lakes (ODWC 2016a, 2017). The subject site is located approximately 2.5 miles east of Keystone Lake, a known location for migrating and wintering bald eagles in Oklahoma. A Bald Eagle nest is along the north side of the Arkansas River approximately two miles southeast of the AEL entrance. Bald Eagles may occasionally occur foraging within the subject site, but are not anticipated to be adversely impacted by the proposed project due to the lack of suitable riverine habitat within the proposed expansions.

Harris's Sparrow

The Harris's Sparrow is the largest sparrow in North America and has a distinguishable black bib and pink bill. This species is a common favorite at backyard birdfeeders but is declining throughout its range. Harris's sparrows are winter residents and found nearly statewide in Oklahoma from mid-October to early May. This species is a non-breeding resident in Oklahoma and therefore would not breed within the subject site. Habitat descriptions for their winter range include: thickets/brush bordering streams, edges of low woodlands, brush and brushy places, hedgerows, and willow thickets in ravines (NatureServe 2017). The Harris's sparrow is primarily a ground feeder with a varied diet that includes insects, fruits and grains. The global status for this species is designated as G5, Secure (NatureServe 2017). This species likely occurs within the subject site during fall and winter due to the availability of suitable woodland habitat and known records on the area.

Red-headed Woodpecker

The red-headed woodpecker is a robin-sized woodpecker with a distinguishable and entirely red head (ODWC 2017). This species is frequently confused with the red-bellied woodpecker, which only has red plumage potions of the top and back of the head. Red-headed woodpeckers typically occur in mature oak woodlands, orchards and riparian woodlands with a relatively open understory particularly near creeks and ponds. They have a varied diet that includes insects, fruits, seeds and tree nuts such as acorns. Dead trees and snags along woodland perimeters provide valuable nesting habitat for this

species (Cornell 2015). They are uncommon in urban or residential neighborhoods. This species can be found breeding statewide in Oklahoma during the summer. In the winter, this species can be found across the eastern ¾ of Oklahoma; their winter numbers vary greatly from year to year depending upon acorn production and weather (ODWC 2017). The species is also listed as "Near Threatened" on the International Union for Conservation of Nature (IUCN) Red List (NatureServe 2017). This species likely occurs year-round within the subject site due to the availability of suitable woodland habitat for breeding, foraging and winter cover.

5.2 OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

The ODWC also maintains lists of state and federally listed TES for each county. According to the ODWC County list, there are no state listed TES or designated critical habitats in Osage County Oklahoma (ODWC 2016c). See also **Appendix B** for the ODWC County list.

5.3 AERIAL PHOTOGRAPH REVIEW

Aerial photographs dated 2018-2015, 2013-2010, 2008, 2006-2003, and 1995 were reviewed using Google Earth Pro Inc. (Google Earth 2018). Aerial photographs were reviewed to identify the proposed project expansion site and potential TES habitat located within or in close proximity to the subject site. Landscape features visible on aerial imagery within the subject site include woodland vegetation and grassland areas with multiple ponds of varying sizes. The subject site also contains some developed areas including two abandoned farmsteads and an access road that transects the subject site from the northeast to southwest **(Appendix A, Figure 2)**.

5.4 USGS TOPOGRAPHIC MAP REVIEW

The USGS 7.5 Minute Topographic Quadrangle (Wekiwa, Okls. Quadrangle, 1958,) indicates that the elevation ranged from 930 feet above mean sea level (amsl) near the north central area of the subject site to approximately 730 feet amsl near the southeast corner of the subject site. The topographic surface is represented as hills and valleys of two intermittent stream drainage ways. Three water features that include two intermittent streams and a freshwater pond are mapped within the subject site **(Appendix A, Figure 3)**.

5.5 NATIONAL WETLANDS INVENTORY MAP REVIEW

SCS conducted a NWI review for preliminary determination of the presence, location, size, and type of wetlands potentially located entirely or partially within the subject site. The U.S. Fish and Wildlife Service (USFWS) generates NWI maps through aerial imagery review, which may not accurately depict the extent or location of wetlands in an area. According to NWI data (USFWS, 2016b), thirteen mapped wetlands are located within the boundary of the subject site. These wetlands are identified as:

WS-1 NWI Features

1. **NWI-1**: A 0.19 Acre PUSCx (Palustrine, Unconsolidated Shore, Seasonally Flooded, Excavated) freshwater pond located near the north-center of the WS-1 Subject Site area.
2. **NWI-2**: A 0.20 Acre PUSCx freshwater pond located near the south-center of the WS-1 Subject Site area.
3. **NWI-3**: A 1.34 Acre PUBFh (Palustrine, Unconsolidated Bottom, Semipermanently Flooded, Diked/Impounded) freshwater pond located near the northeast corner of the WS-1 Subject Site area.

4. NWI-4: A 1.77 Acre PUBHh (Palustrine, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded) freshwater pond located near the eastern Subject Site boundary, south of the 1.34 Acre PUBFh freshwater pond.
5. NWI-5: The northwest end of a 2.44 Acre R5UBF (Riverine, Unknown Perennial, Unconsolidated Bottom, Semipermanently Flooded) riverine habitat that begins at the southwest side of the previously discussed 1.77 Acre PUBHh freshwater pond. This riverine feature traverses off the Subject Site toward the southeast.
6. NWI-6: A 0.22 Acre PUBFh freshwater pond located adjacent to the southern Subject Site boundary.
7. NWI-7: A 0.20 Acre PUBFh freshwater pond located adjacent to the southern Subject Site boundary and west of the previously identified 0.22 Acre PUBFh freshwater pond.

WS-2 NWI Features

1. NWI-8: A 8.16 Acre R5UBF riverine feature located along the western third of the Subject Site running generally from the north to the south of the Subject Site.
2. NWI-9: A 0.25 Acre PUSCh (Palustrine, Unconsolidated Shore, Seasonally Flooded, Dike/Impounded) freshwater pond located near the north border of the Subject Site.
3. MW-10: A 0.22 Acre PUBFh freshwater pond is located near the center of WS-2 along the east slope.
4. NWI-11: A 0.11 Acre PUSCh freshwater pond located near the southeast corner of the subject site.

WS-3 NWI Features

1. NWI-12: A 6.33 Acre R5UBF riverine feature located along the eastern third of the Subject Site running generally from the north to the south of the Subject Site.

WS-4 NWI Features

1. NWI-13: A mid portion of a 6.21 Acre R5UBF riverine feature along the northwest corner of the WS-4 Subject Site Area.

All of the NWI mapped freshwater ponds appear to be excavated/impounded. A wetland determination/delineation report has been completed for the subject site and submitted under separate cover.

5.6 LAND USE LAND COVER

The USGS National Gap Analysis Program (GAP) Land Cover Data (2018) was reviewed to assess general land use and land cover within the subject site. Land cover data indicates that the subject site is dominated by forest/woodland vegetation with small scattered areas of introduced and semi-natural vegetation as well as developed areas (roads) and limited open water. The dominate vegetation within the subject site is described by the GAP as Crosstimbers Oak Forest and Woodland.

6.0 FIELD INVESTIGATION

SCS conducted an on-site field assessment May 24th - 25th, 2018 to evaluate the potential habitat for TES within the proposed subject site. A general assessment of landscape features, vegetative cover, and soils was conducted to characterize and categorize habitats observed and to evaluate the potential presence of listed species and/or their associated habitat.

6.1 OBSERVED HABITATS

The subject site includes a variety of land cover types including woodland, grassland, wetlands, and developed areas. Descriptions of each general habitat type are provided below.

6.1.1 WOODLAND

Most of the subject site is dominated by native oak woodland savannah habitat. Woodland areas are composed predominantly of oak species including blackjack oak (*Quercus marilandica*), Chinquapin Oak (*Q. muehlenbergii*), and post oak (*Q. stellata*) with some hickory (*Carya sp.*) and increasing cover of eastern red cedar (*Juniperus virginiana*). Lowland woodlands were comprised of a higher diversity of tree species including: American elm (*Ulmus americana*), hackberry (*Celtis occidentalis*), plains cottonwood (*Populus deltoides*), willow (*Salix spp.*), walnut (*Juglans spp.*), ash (*Fraxinus pennsylvanica*), sycamore (*Platanus occidentalis*) as well as other tree species. The aforementioned list of identified trees is not inclusive off all tree species within the subject site.

The woodlands were predominantly tall mature trees with generally an open understory. Woodland areas are located along in the east slope of the NE1/2 of the subject site, the western slope of the eastern watershed and all of the western watershed. Individual trees occurred within and around rock outcrops as well as along steep slopes, valleys and hill tops. The ground cover within the woodlands consisted of sparse vegetative cover mixed with prominent leaf litter. The woodlands were predominantly undisturbed and could provide suitable habitat for the Norther Long-Eared Bat. Several areas within the woodlands have soft silt-sandy soils that ABB would be able to utilize if proper prey opportunities were present.

AEL's operations, not including the active placement of solid waste, uses a portion of the subject site for facility equipment storage and to transport soil and equipment. An area that has had extensive tree removal completed is located inside of an access road used by AEL. The access road can be seen in aerial photographs beginning west of a large soil stockpile in the south ½ of the NE ¼ of the subject site. This access road traverses to the south along the west valley side of the east drainage. This access road then turns east near the middle of the SE ¼ of the subject site. This area was heavily wooded prior to 2013 but appears to have been thinned prior to 2015. This thinned area is currently a combination of scattered mature trees within a lowland grassland. This grassland area will be discussed below. Aside from this thinned area, the woodlands within the subject site had a uniform cover only broken by two access roads and two homestead structures.

6.1.2 GRASSLAND/RANGELAND

Grassland species observed within the subject site includes both native and introduced species. Dominant grassland species observed within the subject site includes: little bluestem, indian grass, Johnson grass (*Sorghum halepense*), and broomsedge bluestem (*Andropogon virginicus*). Two types of grasslands were observed within the subject site. A short grass vegetative community was observed along the tops of hills within breaks of the tree canopy; the soils in these areas were shallow and rocky.

The second type of grasslands were found in lowlands including the fore mentioned thinned woodland area. A mixture of tall and short grass prairie species with some invasive species dominated these lowland plant communities. Soils in these areas were loose and relatively thick with minimal rock within the soil profiles. Soils in lowland areas were often a combination of silt loam and sand. Small areas that had sparse vegetative cover often had erosional rills in these lowland areas. The observed grasslands were predominantly undisturbed and would provide suitable habitat for the Rattlesnake-Master Borer plant, which the Rattlesnake-Master Borer Moth are dependent on, and soils that are preferable to the ABB.

6.1.3 WETLANDS AND WATERCOURSES

The subject site is comprised of four watersheds associated with channels that typically drain from the north to the south. The east watershed includes a portion of AEL's active landfill operations and the west watershed is dominated by a mature woodland area. A USACE approved jurisdiction determination identified three stream channels and one pond that are jurisdictional. The jurisdictional channels are a combination of ephemeral and intermittent. The east channel will be impacted while the two west channels will remain undisturbed from the proposed expansion. The jurisdictional pond will remain undisturbed from the proposed expansion and mitigation.

A review of the NWI and NHD identified the four jurisdictional features. Observed hydric habitats ranged from permanent pools with true aquatic plants, fish, and benthic species to sparse hydric vegetative cover near surface water under a woodland canopy. Both west stream segments had sunfish species including green sunfish (*Lepomis cyanellus*) and bluegill (*L. macrochirus*). Mayflies (Ephemeroptera) and dragonfly nymphs (Odonata) in isolated pools along intermittent stream channels. Wetland plants were dominated by broadleaf cattail (*Typha angostifolia*), knot weed (*Persicaria bicornis*), coon's tail (*Ceratophyllum demersum*), green ash tree, and black willow (*Salix nigra*).

For additional information regarding wetland areas and watercourses within the project corridor, please reference the wetland delineation report prepared under separate cover.

7.0 OBSERVED TES AND/OR ASSOCIATED HABITATS

Numerous wildlife species were observed during the field investigation including but not limited to turkey vulture (*Cathartes aura*), white-tailed deer (*Odocoileus virginianus*), nine-banded armadillo (*Dasypus novemcinctus*), cottontail rabbits (*Sylvilagus floridanus*), northern bobwhite quail (*Colinus virginianus*), multiple songbird species, and snake species. Incidental occurrences of threatened, endangered or candidate species were not observed during the field assessment. However, this does not preclude the potential that a listed species could utilize suitable habitat within the subject site. The presence of potentially suitable habitat for TES was assessed based on the documentation reviewed and verified during field assessment. Table 1 below indicates the likelihood of TES occurring within the subject site based on SCS's assessment of publically available resources (documentation review) and on-site field observations. Species considered possible or likely to occur within the subject site are discussed in greater detail below the table. For those species that suitable habitat was not observed during the site visit and identified in the table as unlikely will not be discussed further.

Table 1: Likelihood of TES Occurrence within the Subject Site

Common Name	Federal Listing	Likelihood	Rationale
Northern Long-Eared Bat	Threatened	Possible	Suitable woodland habitat present
American Burying Beetle	Endangered	Likely	Suitable sandy-silty soils habitat present and subject site is located within the core of this species' population range
Whooping Crane	Endangered	Unlikely	Significant suitable habitat not present
Red Knot	Endangered	Unlikely	Significant suitable habitat not present and species has not been documented in this region in recent years
Piping Plover	Threatened	Unlikely	Significant suitable wetland habitat not present
Least Tern	Endangered	Unlikely	Significant suitable wetland habitat not present
Rattlesnake-Master Borer Moth	Candidate	Possible	Suitable prairie and woodland habitat present
Bald Eagle	MBTA and BGEPA	Possible	Significant suitable habitat not present, but occurs in large numbers at Keystone lake located 2.5 miles west of subject site and documented occurrence in vicinity of subject site
Harris's Sparrow	MBTA	Likely	Documented occurrences in vicinity and suitable habitat present
Red-headed woodpecker	MBTA	Likely	Documented occurrences in vicinity and suitable habitat present

7.1 NORTHERN LONG-EARED BAT

The northern long eared bat utilizes a variety of tree species in woodland areas as warm season roosts from mid-March through mid-October. Potential suitable woodland habitat for the northern long eared bat, was observed within the subject site during the desktop review and was confirmed during the field investigation. The northern long-eared bat could use the subject site for foraging, brood rearing and summer roosts. During the winter months, this species is not expected to occur within the subject site. SCS understands that during the period from mid-March through mid-October, the removal of trees within the woodlands could have an impact to northern long-eared bat individuals. Tree removal after mid-October and before mid-March should have little to no impact to individuals. If trees are removed during this period, no permit should be required.

If tree removal is necessary between mid-March through mid-October, there are options that help determine if the northern long-eared bat is present and could be impacted from tree removal. These options include:

1. conducting an acoustic monitoring survey that will help identify if high frequency myotis bat species are present
    a. if monitoring results indicate that high frequency myotis species are present then
        i. conduct a mist netting to help confirm the presence of protected species
            1. If protected species are captured and observed then mitigation for habitat impacts (tree removal) will likely be required
            2. If no protected species are captured then tree removal may proceed without a mitigation
        ii. Mitigation for habitat impacts based on the higher probability that protected species are present (no true confirmation)
    b. If acoustic monitoring results indicate that no high frequency species are present then tree removal may likely occur without mitigation requirements
2. Mist netting to identify bat species present to determine if protected species are present.
    a. If protected species are captured and observed then mitigation for habitat impacts (tree removal) will likely be required
    b. If no protected species are captured then tree removal may likely proceed without mitigation
3. Mitigate for potential impacts to protected bat species – regardless if bat species are present or not.

Regardless of the option, coordination with USFWS and ODWC is recommended to assure that an approved assessment plan meets with the agencies' oversite authority. The assessment option(s) chosen will determine the level of permitting that may be necessary to complete facility expansion. Construction activities, particularly tree clearing and/or ground disturbance, should be avoided until agency coordination and project review is complete.

7.2 AMERICAN BURYING BEETLE

There is no critical habitat designation for this species, but the highest densities of ABB occur in open, oak-hickory forests with native grass cover; populations also occur in both closed-canopy forest and tallgrass prairie habitats. The ABB prefers loose soils in areas with minimal human disturbance. Soil disturbance from construction projects are a concern for this species. Potential suitable habitat for this species was observed within the subject site during the field investigation. In addition, multiple records for the ABB are currently known for Osage County, Oklahoma. With potential habitat identified within the subject site and historical collections from the area, development from the proposed

expansion could have detrimental impacts to ABB individuals. To determine if ABB individuals are present within or near the subject site, SCS recommends an ABB presence/absence assessment be completed prior to any natural habitat disturbance. Because of their highly mobile capabilities, annual monitoring needs to be completed prior to any scheduled ground disturbance. Based on the ABB life cycle, monitoring for ABB would need to be completed between May 20 and September 20 (or when evening temperatures are consistently over 60°F). ABB monitoring in Oklahoma is divided into two sample periods. The first monitoring period is from May 20th through July 28th. This monitoring period provides results for potential disturbances that will occur within this period. The second monitoring period is from July 29th through September 20th. Results from this second monitoring period provide impact results from July 29th until May 20th of the following year. Monitoring results are good for only those dates discussed. Depending on the result of the ABB survey, an incidental take permit may be required prior to development of the subject site. Mitigation may be required as part of securing the incidental take permit. Coordination with USFWS and ODWC is recommended to avoid potential unauthorized impacts to this species. Construction activities that include soil compaction, soil disturbance and ground clearing should be avoided until agency review and approval is obtained.

7.3 RATTLESNAKE-MASTER BORER MOTH

The rattlesnake-master borer moth occupies a unique ecological niche associated specifically with the rattle snake master plant. This species is typically found in mesic prairies, glades and rocky woodlands where it blooms from May through August. Although the rattle snake master plant was not observed during the SCS site assessment, potential suitable habitat for this species was observed within the subject site.

SCS acknowledges that this species may be impacted from development activities associated with the proposed expansion. However, as a candidate for federal listing this species is not offered enforceable protection under the ESA. Nonetheless, SCS recommends that coordination with the USFWS be established to minimize impacts to this species. This plan would help minimize impacts to the rattlesnake-master borer moth while allowing for the continual development of the proposed expansion.

7.4 BALD EAGLE, HARRIS'S SPARROW AND RED-HEADED WOODPECKER

The bald eagle, Harris's sparrow, and red-headed woodpecker are not listed as TES but are afforded federal protection under the MBTA and/or the BGEPA. These species are currently known to occur in Osage County and utilize a variety of habitats observed within and adjacent to the subject site including woodlands. A bald eagle nest was observed by SCS Staff along the Arkansas River approximately two miles southeast of the subject site. The Harris's sparrow does not nest within the region but are winter residents. The red-headed woodpecker is known to both breed and winter within woodland areas of Osage County, Oklahoma. As a year round resident the redheaded woodpecker may be the most adversely impacted by construction activities associated with the subject site. Preliminary USFWS consultation guidance indicates that the red headed woodpecker breeds in this area from May 10 through September 10. Therefore, SCS recommends construction activities be conducted outside these nesting dates in areas of suitable habitat for the red-headed woodpecker. If individuals from these species are observed during construction activities, it is recommended that construction activities cease until the individuals vacate the area. If construction activities occur during the nesting period of the red-headed woodpecker, an active nest survey may need to be completed prior to further construction activities. SCS recommends that coordination with USFWS and ODWC be initiated

regarding these species so as to avoid potential impacts to these and other migratory bird species that may occur within the subject site.

8.0 CONCLUSION

A review of state and/or federally listed TES and designated critical habitats was conducted for the subject site. No designated critical habitats for TES are located within the subject site. However, the USFWS and ODWC list seven federally threatened, endangered, and/or candidate species which may occur within the proposed subject site including:

- Northern Long-Eared Bat
- Least Tern
- Piping Plover
- Red Knot
- Whooping Crane
- American Burying Beetle
- Rattlesnake-Master Borer Moth

For each species, an estimated level of impact that would result from the proposed expansion activities was determined based on their habitat preferences, diet, reproductive needs, and likelihood to occur within the subject site. In addition to the TES, the USFWS lists three additional migratory bird species that may occur within the subject site and are protected by MBTA and the BGEPA which include:

- Bald Eagle
- Harris's Sparrow
- Red-headed Woodpecker.

TES were not observed during the site assessment and potentially suitable habitat is not available or limited for the majority of TES species listed for the subject site. Nonetheless, three federally protected TES have the potential to occur within the subject site and include:

- The northern long-eared bat
- American Burying Beetle
- Rattlesnake-master Borer Moth

The potential presence of these three species was based on the availability of suitable habitat and documented species records for the area.

9.0 GENERAL COMMENTS

Conclusions drawn by others from the results of this work should recognize the limitation of the methods used. Please note that SCS does not warrant the work of regulatory agencies or other third parties supplying information used in assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering practices, within the constraints of the client's directives. It is intended for the exclusive use of the client for specific application to the assessed property. No guarantees, express or implied, are intended or made.

10.0 REFERENCES

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Appendix A

Figure 1 - AEL Subject Site Location

Figure 2 – Aerial Photograph of the AEL Subject Site

Figure 3 – Topographic Map of AEL Proposed Expansion

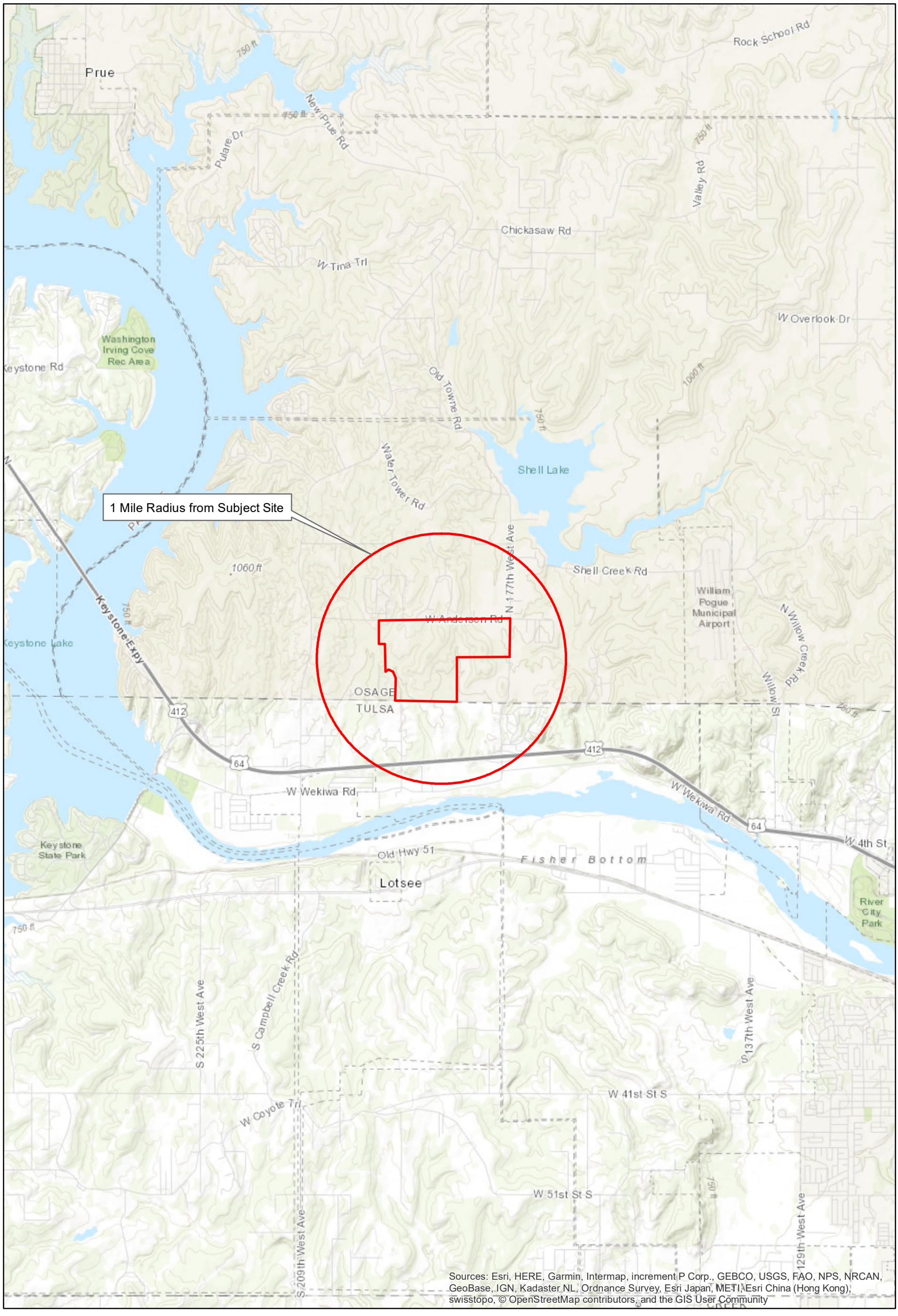

Figure 1.

AEL Subject Site Location
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 3,100 6,200 12,400 18,600 24,800 Feet

N

SCS ENGINEERS

CONSULTING ENGINEERS, INC.
11120 E. 26th St. North, Suite 1100
Wichita, Kansas 67226
PH. (316) 315-4501 FAX. (316) 315-4505

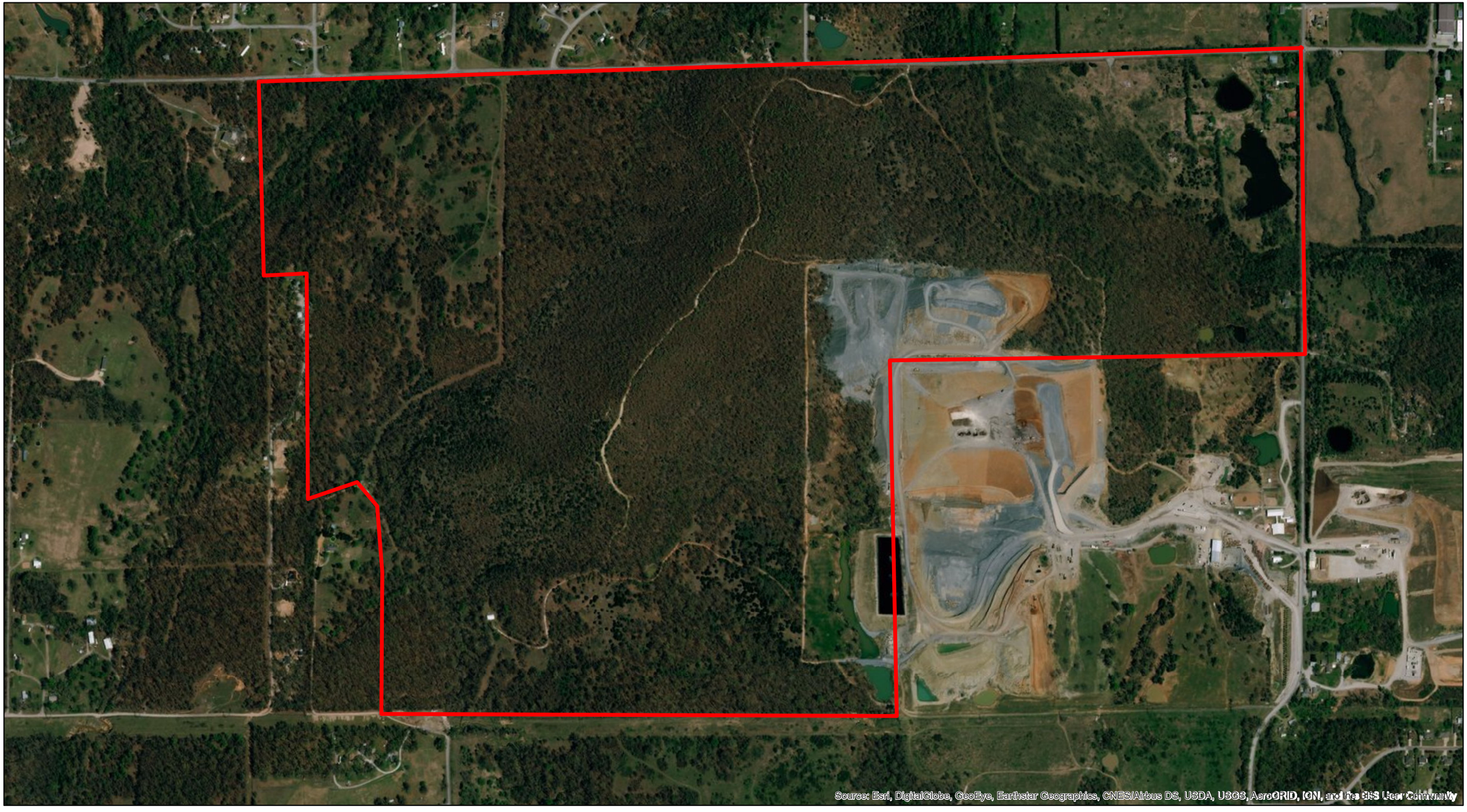

Figure 2. **Aerial Photograph of the AEL Subject Site**
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 315 630 1,260 1,890 2,520
Feet

N

SCS ENGINEERS
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11120 E. 26th St. North, Suite 1100
Wichita, Kansas 67226
PH. (316) 315-4501

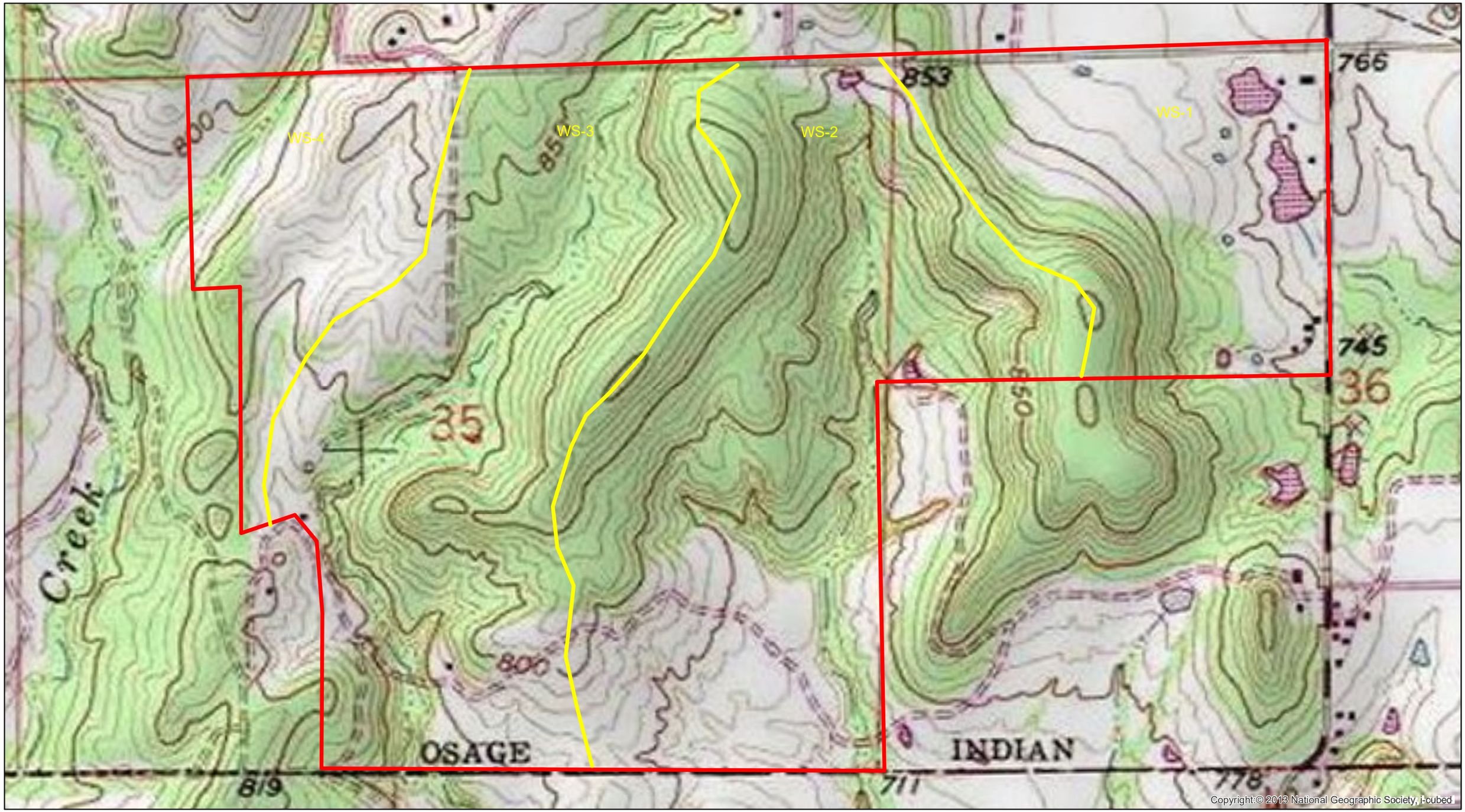

Figure 3. **Topographic Map of AEL Proposed Expansion**
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

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SCS ENGINEERS
CONSULTING ENGINEERS, INC.
11120 E. 26th St. North, Suite 1100
Wichita, Kansas 67226
PH. (316) 315-4501

Appendix B

USFWS Official Species List

USFWS IPAC Resource List

ODWC County by County List of Endangered and Threatened Species

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, OK 74129-1428
Phone: (918) 581-7458 Fax: (918) 581-7467
http://www.fws.gov/southwest/es/Oklahoma/

In Reply Refer To:
Consultation Code: 02EKOK00-2019-SLI-1477
Event Code: 02EKOK00-2019-E-03451
Project Name: AEL Expansion

March 27, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Non-federal entities conducting activities that may result in take of listed species should consider seeking coverage under section 10 of the ESA, either through development of a Habitat Conservation Plan (HCP) or, by becoming a signatory to the General Conservation Plan (GCP) currently under development for the American burying beetle. Each of these mechanisms provides the means for obtaining a permit and coverage for incidental take of listed species during otherwise lawful activities.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit through our Project Review step-wise process http://www.fws.gov/southwest/es/oklahoma/OKESFO%20Permit%20Home.htm.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, OK 74129-1428
(918) 581-7458

Project Summary

Consultation Code: 02EKOK00-2019-SLI-1477

Event Code: 02EKOK00-2019-E-03451

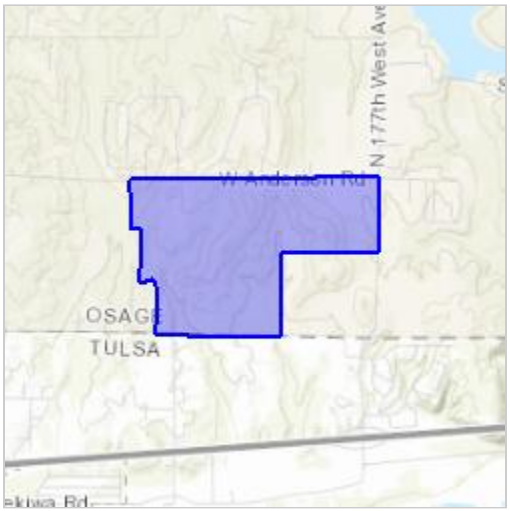
Project Name: AEL Expansion

Project Type: Landfill

Project Description: Landfill Expansion Project

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/36.16725438085243N96.20463310289702W



Counties: Osage, OK | Tulsa, OK

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Least Tern *Sterna antillarum* Population: interior pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8505	Endangered
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

Insects

NAME	STATUS
American Burying Beetle *Nicrophorus americanus* Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/66	Endangered
Rattlesnake-master Borer Moth *Papaipema eryngii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7863	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Harris's Sparrow *Zonotrichia querula* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

NAME	BREEDING SEASON
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

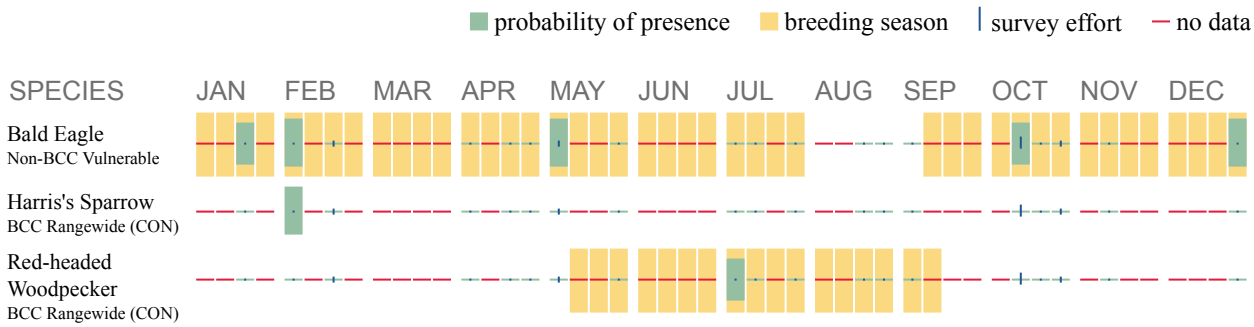
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or

permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In

contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER POND

- PUBFh
- PUSCh
- PUBHh
- PUSCx

RIVERINE

- R5UBF

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

Osage and Tulsa counties, Oklahoma

Local office

Oklahoma Ecological Services Field Office

(918) 581-7458
(918) 581-7467

9014 East 21st Street
Tulsa, OK 74129-1428

http://www.fws.gov/southwest/es/Oklahoma/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

NOT FOR CONSULTATION

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Least Tern Sterna antillarum No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8505	Endangered
Piping Plover Charadrius melodus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot Calidris canutus rufa No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane Grus americana There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/758	Endangered

Insects

NAME	STATUS
American Burying Beetle Nicrophorus americanus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/66	Endangered
Rattlesnake-master Borer Moth Papaipema eryngii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7863	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

You should contact the local field office to determine whether critical habitat for the following species should be considered:

NOT FOR CONSULTATION

NAME	TYPE
Whooping Crane Grus americana https://ecos.fws.gov/ecp/species/758#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY

NOT FOR CONSULTATION

	BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Harris's Sparrow Zonotrichia querula This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10

NOT FOR CONSULTATION

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence

across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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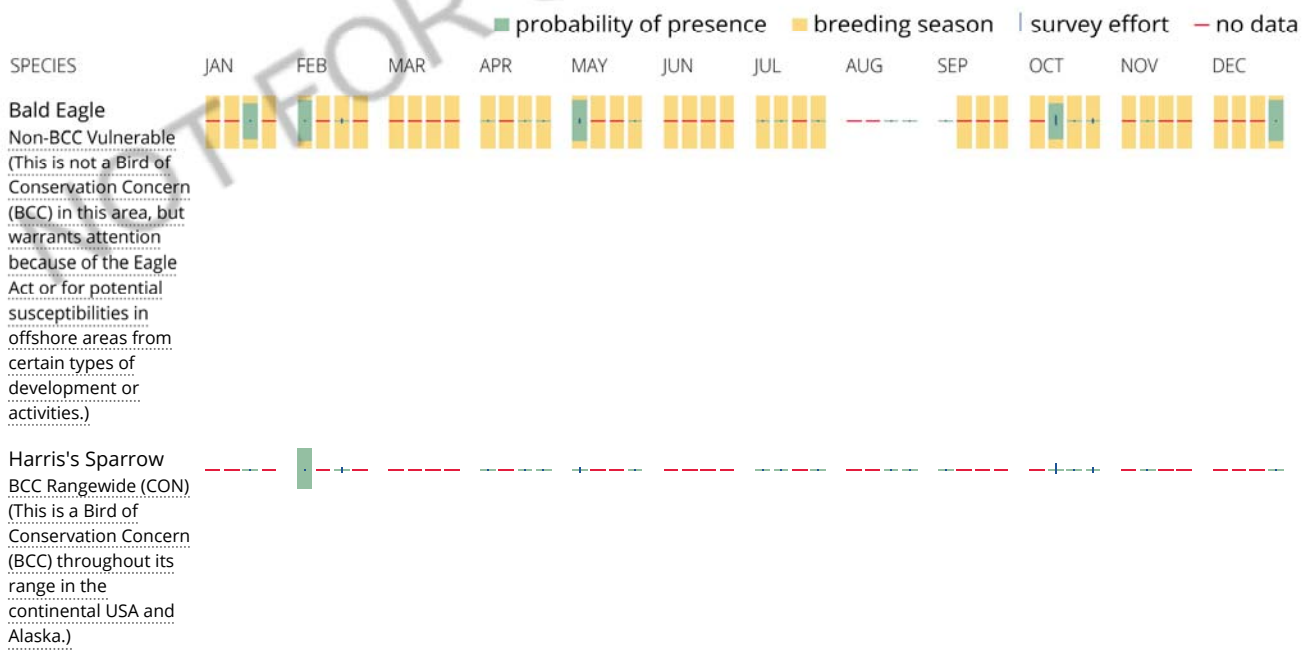

Red-headed Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

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Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER POND

- PUBFh
- PUBHh
- PUSCx
- PUSCh

RIVERINE

- R5UBF

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

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The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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County by County List of Endangered and Threatened Species

Adair County
State-listed Threatened and Endangered Species:
Neosho Mucket (*Lampsilis rafinesqueana*) – endangered
Long-nosed Darter (*Percina nasuta*) – endangered
Black-sided Darter (*Percina maculata*) - threatened

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed threatened and endangered in this county may include:
Gray Bat (*Myotis grisescens*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Ozark Big-eared Bat (*Corynorhinus* (= *Plecotus*) *townsendii ingens*) - endangered

Alfalfa County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Whooping Crane (*Grus americana*) - endangered

Atoka County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
American Burying Beetle (*Nicrophorus americanus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Beaver County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Whooping Crane (*Grus americana*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation

Beckham County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Blaine County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Bryan County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
American Burying Beetle (*Nicrophorus americanus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Caddo County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Canadian County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Carter County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Cherokee County
State-listed Threatened and Endangered Species:

Neosho Mucket (*Lampsilis rafinesqueana*) - endangered

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Gray Bat (Myotis *grisescens*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Ozark Big-eared Bat (*Corynorhinus* (= *Plecotus*) *townsendii ingens*) - endangered
American Burying Beetle (*Nicrophorus americanus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation

Choctaw County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Scaleshell (*Leptodea leptodon*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Cimarron County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation
Mountain Plover (*Charadrius montanus*) – candidate species under evaluation

Cleveland County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Coal County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered

Comanche County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered

Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Cotton County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Craig County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
American Burying Beetle (*Nicrophorus americanus*) - endangered
Neosho Madtom (*Noturus placidus*) – threatened
Piping Plover (*Charadrius melodus*) - threatened
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation

Creek County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Custer County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Delaware County

State-listed Threatened and Endangered Species:

Neosho Mucket (*Lampsilis rafinesqueana*) – endangered
Oklahoma Cave Crayfish (*Cambarus tartarus*) - endangered

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Gray Bat (Myotis *grisescens*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Ozark Big-eared Bat (*Corynorhinus* (= *Plecotus*) *townsendii ingens*) - endangered
American Burying Beetle (*Nicrophorus americanus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Ozark Cavefish (*Amblyopsis rosae*) - threatened
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation

Dewey County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered

Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation

Ellis County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation

Garfield County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Garvin County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Grady County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Grant County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Greer County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Harmon County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Harper County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation

Haskell County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Hughes County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact

the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Jackson County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Jefferson County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Johnston County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Kay County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Kingfisher County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Kiowa County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Latimer County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

LeFlore County
State-listed Threatened and Endangered Species:

Black-sided Darter (*Percina maculata*) -threatened

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Ouachita Rock Pocketbook (*Arkansia wheeleri*) – endangered
Scaleshell (*Leptodea leptodon*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Leopard Darter (*Percina pantherina*) - threatened

Lincoln County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Logan County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Love County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Major County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Marshall County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Mayes County
State-listed Threatened and Endangered Species:

None

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Gray Bat (*Myotis grisescens*) – endangered
Piping Plover (*Charadrius melodus*) – threatened
Ozark Cavefish (*Amblyopsis rosae*) - threatened
Arkansas Dater (*Etheostoma cragini*) – candidate species under evaluation

McClain County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

McCurtain County
State-listed Threatened and Endangered Species:

Black-sided Darter (*Percina maculata*) - threatened

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Red-cockaded Woodpecker (*Picoides borealis*) - endangered
Ouachita Rock Pocketbook (*Arkansia wheeleri*) – endangered
Scaleshell (*Leptodea leptodon*) - endangered
Winged Mapleleaf (*Quadrula fragosa*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Leopard Darter (*Percina pantherina*) - threatened

McIntosh County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Murray County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Muskogee County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Noble County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Nowata County
State-listed Threatened and Endangered Species:

Neosho Mucket (*Lampsilis rafinesqueana*) – endangered; historic occurrence in Verdigris River

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Okfuskee County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact

the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Oklahoma County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Okmulgee County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Osage County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Ottawa County
State-listed Threatened and Endangered Species:
Neosho Mucket (*Lampsilis rafinesqueana*)

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Gray Bat (*Myotis grisescens*) – endangered
Ozark Big-eared Bat (*Corynorhinus* (= *Plecotus*) *townsendii ingens*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) – threatened
Neosho Madtom (*Noturus placidus*) – threatened
Ozark Cavefish (*Amblyopsis rosae*) - threatened
Arkansas Dater (*Etheostoma cragini*) – candidate species under evaluation

Pawnee County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Payne County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Pittsburg County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
American Burying Beetle (*Nicrophorus americanus*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Pontotoc County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Pottawatomie County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Arkansas River Shiner (*Notropis girardi*) – threatened

Pushmataha County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Red-cockaded Woodpecker (*Picoides borealis*) - endangered
Ouachita Rock Pocketbook (*Arkansia wheeleri*) – endangered
Scaleshell (*Leptodea leptodon*) - endangered
Winged Mapleleaf (*Quadrula fragosa*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Leopard Darter (*Percina pantherina*) - threatened

Roger Mills County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation

Rogers County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Seminole County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Sequoyah County

State-listed Threatened and Endangered Species:

Long-nosed Darter (*Percina nasuta*) - endangered
Black-sided Darter (*Percina maculata*) - threatened

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Stephens County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact

the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Texas County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation
Mountain Plover (*Charadrius montanus*) – candidate species under evaluation

Tillman County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Tulsa County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact

the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Wagoner County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Washington County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Piping Plover (*Charadrius melodus*) - threatened

Washita County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered

Woods County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation

Woodward County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation

From: Horton, Russ
To: Weaver, Vaughn
Subject: Re: Follow up on AEL
Date: Tuesday, April 14, 2020 10:09:01 PM
Attachments: image001.jpg

========== This message originated outside of SCS Engineers ==========

Vaughn:

Having heard nothing back from my staff, we have no comments / concerns RE this project.

Thank you,

Russ Horton
Assistant Chief of Wildlife Division
Oklahoma Department of Wildlife Conservation
1801 North Lincoln Blvd
Oklahoma City OK 73105
(405) 521-2730 (Office)
(405) 202-5901 (Cell)
russ.horton@odwc.ok.gov

On Tue, Apr 14, 2020 at 10:26 AM Weaver, Vaughn <VWeaver@scsengineers.com> wrote:

> Mr. Horton,
>
> We sent a report to ODWC for review on February 10, 2020. I am checking to see if there are any concerns with the proposed project? I can't find a response from ODWC on this project and am just following up.
>
> Vaughn Weaver
>
> Senior Project Biologist
>
> 11120 E. 26th Street North
>
> Suite 1100
>
> Wichita, Kansas 67226

Office: 316-315-4501

Fax: 316-315-4505

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United States Department of the Interior – Fish and Wildlife Services

April 24, 2019
File No. 27216290.00

US Fish and Wildlife Service (USFWS)
Oklahoma Ecological Services Office
9014 E 21st Street
Tulsa, OK 74129

Subject: AEL Expansion
Osage County Oklahoma

Dear Project Review Staff:

SCS Engineers (SCS) is submitting this request for project review on behalf of American Environmental Landfill (AEL) for a proposed western expansion of an active landfill located northwest of Sand Springs in Osage County, Oklahoma (Figure 1). The subject site includes approximately 435 acres in Sections 35 and 36, T20N, R10E, near Latitude 36.166643 Longitude -96.203007. See Figure 2 and Figure 3 for a more detailed project boundary.

This request for project review is submitted in conjunction with an application for an Individual Permit from the U.S. Army Corps of Engineers (USACE).

There are seven Threatened and Endangered Species (TES) identified by the USFWS that may occur within the subject site or be impacted by the proposed project. See the attached official species list issued for the proposed subject on March 27, 2019 (Attachment 1). Below is the required Species Conclusion Table generated for the proposed project area, which includes the listed species for the site as well as the occurrence of suitable habitat, potential adverse impacts (if any or if known) as well as ESA determinations, based on the professional assessment of SCS staff. In addition, SCS is including a preliminary Habitat Assessment Report generated under separate cover for your reference.

Species Conclusion Table

Species	Habitat Determination	Notes/Documentation	ESA Determination
Northern Long-Eared Bat	Habitat present	Suitable mature woodland habitat present. No recent surveys	Recommend coordination with USFWS OK Field Office
American Burying Beetle	Habitat present	Suitable woodland/grassland habitat present and subject site is located within the core of this species' population range. No recent surveys.	Recommend coordination with USFWS OK Field Office

Species	Habitat Determination	Notes/Documentation	ESA Determination
Whooping Crane	No habitat present	No significant suitable wetland and cropland habitat present	No effect
Red Knot	No habitat present	Significant suitable habitat not present and species has not been documented in this region in recent years	No effect
Piping Plover	No habitat present	No large wetlands, salt flats or sand bars within or in close proximity to the subject site	No effect
Least Tern	No habitat present	No large wetlands, salt flats or sand bars within or in close proximity to the subject site	No effect
Rattlesnake-Master Borer Moth	Habitat present	Suitable prairie and woodland habitat present. No recent surveys	Recommend coordination with USFWS OK Field Office

Species specific surveys have not been conducted for the proposed project. Construction for the expansion project is uncertain, but anticipated within 12-24 months of this request for project review pending USACE and all other agency permits and approvals.

As part of the USACE permit process, an approved USFWS TES avoidance/minimization management plan shall be generated for the project area. This letter is to initiate consultation with the USFWS so as to establish a TES management plan.

We appreciate your review of the proposed project and request USFWS guidance to avoid and minimize impacts to TES or other sensitive species potentially located within the project area. Please contact Vaughn Weaver at 316-494-7518 or at vweaver@scsengineers.com. We look forward to working with the USFWS on this project.

Sincerely,

Vaughn Weaver
Senior Project Professional
SCS Engineers

Amy Zavala Garnsey
Biologist

c.c. Wade Miller

Encl.

Online BA/BE Review Request Form,
Figures 1, 2 and 3,
USFWS Official Species List,
SCS TES Habitat Assessment Report

OKESFO Online BA/BE Review Request

From: SCS Engineers on behalf of American Environmental Landfill (AEL)
1817 Commons Circle, Suite 1
Yukon, OK 73099
316-494-7518 (Vaughn Weaver)

To: U.S. Fish and Wildlife Service
Oklahoma Ecological Services Field Office
9014 E 21st Street
Tulsa, Oklahoma 74129

April 24th, 2019

Re: Online Project Review Request

AEL Expansion Project in Osage County Oklahoma

We have reviewed the referenced project using the Oklahoma Ecological Services Field Office's online project review process and have followed all guidance and instructions in completing the review. We completed our review on March 27th, 2019 and are submitting our project review package in accordance with the instructions for further review.

Our proposed action consists of:

American Environmental Landfill is in the planning stage of expanding their operations by constructing future cells west of their current active landfill. The proposed expansion would include the purchase and permitting of land adjacent to their western property boundary. This request for project review is submitted in conjunction with an application for an Individual Permit from the U.S. Army Corps of Engineers (USACE).

The location of the project and the action area are identified on the enclosed map

SCS has generated both aerial and topographic maps to show the project boundary for the proposed expansion. GIS shapefiles of the project boundary can be provided if needed/requested.

The project is expected to be completed expansion will start as soon as feasible once permitting is a

This project review is needed for

This request for project review is submitted in conjunction with an application for an Individual Permit from the U.S. Army Corps of Engineers (USACE).

The enclosed project review package provides the information about the species and critical habitat considered in our review, and the species conclusions table included in the package identifies our determinations for the resources that may be affected by the project.

For additional information, please contact Vaughn Weaver at the address listed above.

Sincerely,

Vaughn Weaver

Enclosures:

1) ENTIRE PROJECT REVIEW PACKAGE:
   - ☑ Species Conclusion Table
   - ☑ IPaC Species List and Action Area map
   - ☑ This form (Online BA/BE Review Request)
   - ☑ Biological Assessment/Evaluation for Review
   - ☑ (Optional) Additional maps

2) Other relevant project data/documents

N/A

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, OK 74129-1428
Phone: (918) 581-7458 Fax: (918) 581-7467
http://www.fws.gov/southwest/es/Oklahoma/

In Reply Refer To:
Consultation Code: 02EKOK00-2019-SLI-1477
Event Code: 02EKOK00-2019-E-03451
Project Name: AEL Expansion

March 27, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Non-federal entities conducting activities that may result in take of listed species should consider seeking coverage under section 10 of the ESA, either through development of a Habitat Conservation Plan (HCP) or, by becoming a signatory to the General Conservation Plan (GCP) currently under development for the American burying beetle. Each of these mechanisms provides the means for obtaining a permit and coverage for incidental take of listed species during otherwise lawful activities.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit through our Project Review step-wise process http://www.fws.gov/southwest/es/oklahoma/OKESFO%20Permit%20Home.htm.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, OK 74129-1428
(918) 581-7458

Project Summary

Consultation Code: 02EKOK00-2019-SLI-1477

Event Code: 02EKOK00-2019-E-03451

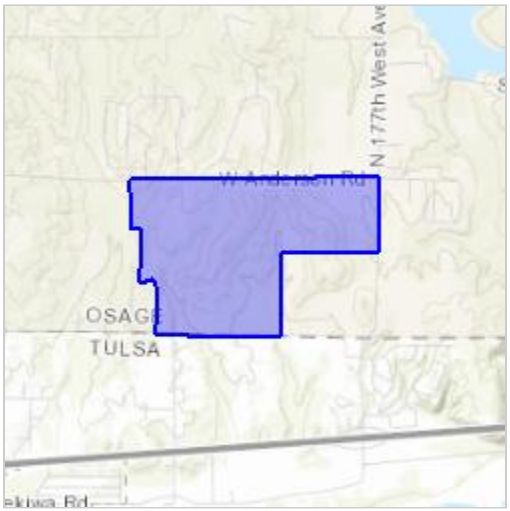
Project Name: AEL Expansion

Project Type: Landfill

Project Description: Landfill Expansion Project

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/36.16725438085243N96.20463310289702W



Counties: Osage, OK | Tulsa, OK

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Least Tern *Sterna antillarum* Population: interior pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8505	Endangered
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

Insects

NAME	STATUS
American Burying Beetle *Nicrophorus americanus* Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/66	Endangered
Rattlesnake-master Borer Moth *Papaipema eryngii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7863	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Harris's Sparrow *Zonotrichia querula* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

NAME	BREEDING SEASON
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

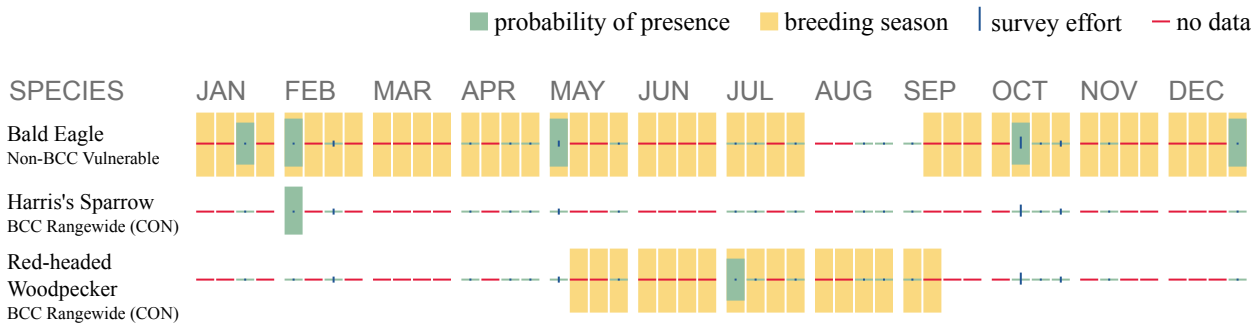
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or

permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In

contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER POND

- PUBFh
- PUSCh
- PUBHh
- PUSCx

RIVERINE

- R5UBF

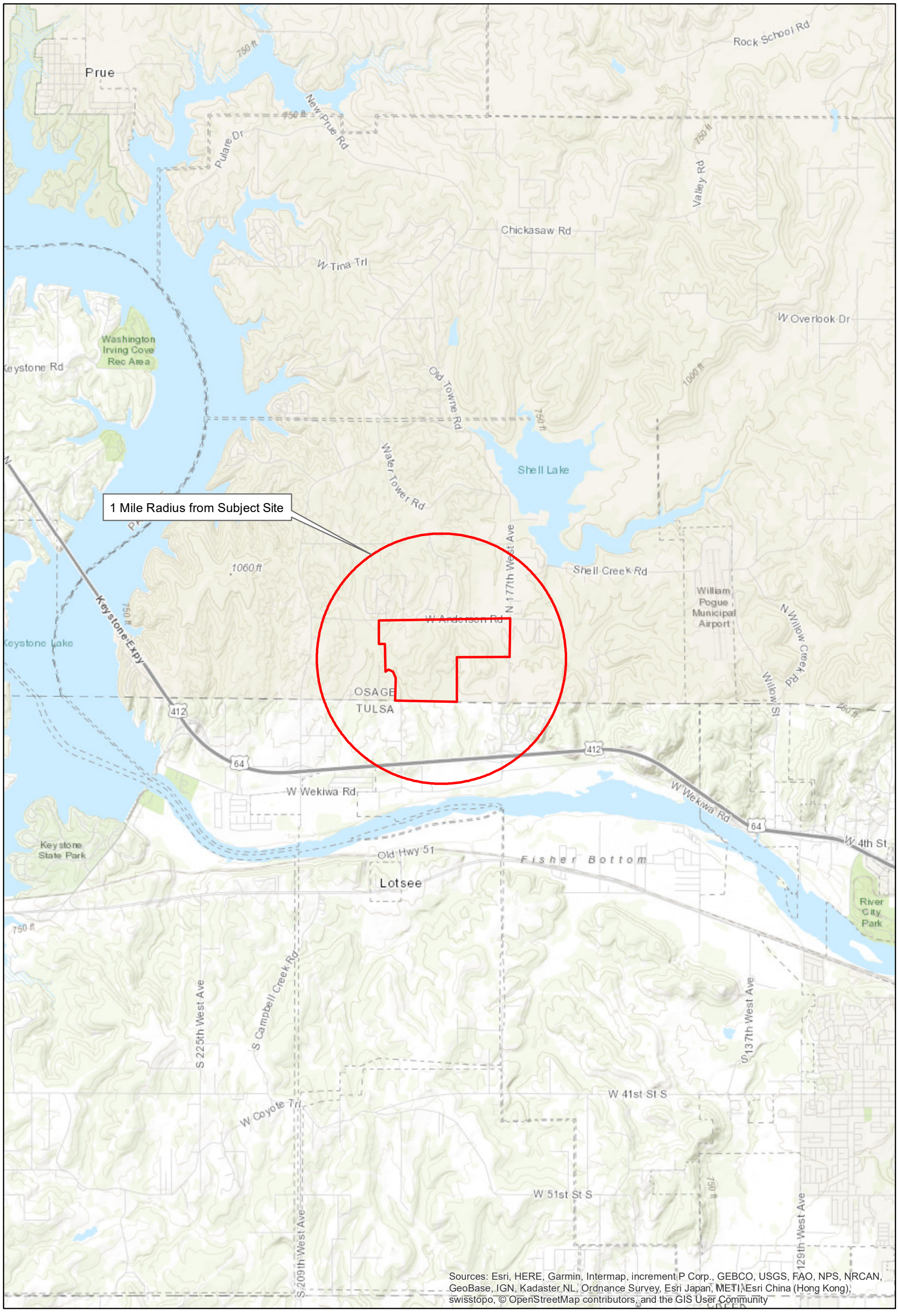


Figure 1.

AEL Subject Site Location
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 3,100 6,200 12,400 18,600 24,800 Feet

N

SCS ENGINEERS

CONSULTING ENGINEERS, INC.
11120 E. 26th St. North, Suite 1100
Wichita, Kansas 67226
PH. (316) 315-4501 FAX. (316) 315-4505

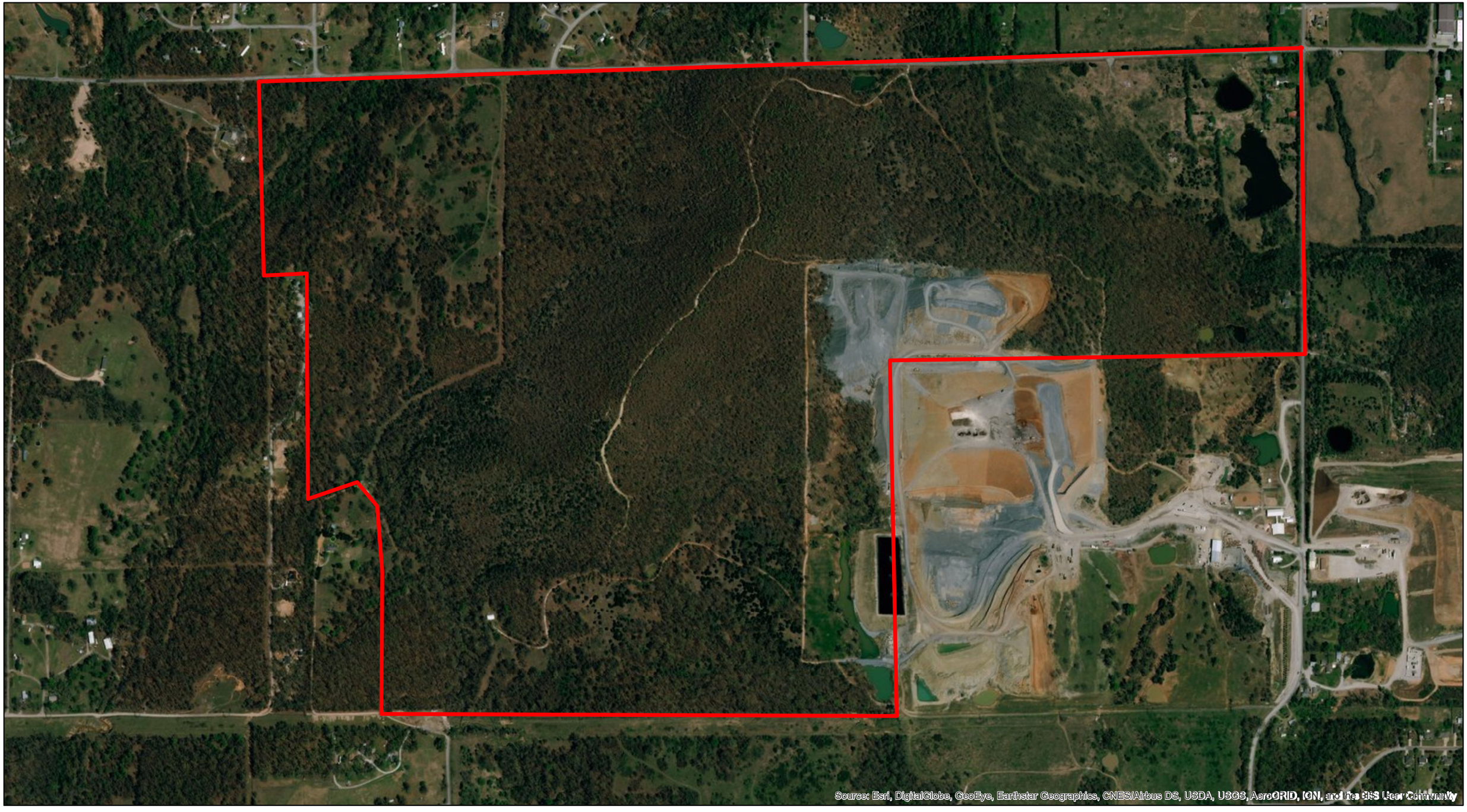


Figure 2. **Aerial Photograph of the AEL Subject Site**
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 315 630 1,260 1,890 2,520
Feet

N

SCS ENGINEERS
CONSULTING ENGINEERS, INC.
11120 E. 26th St. North, Suite 1100
Wichita, Kansas 67226
PH. (316) 315-4501

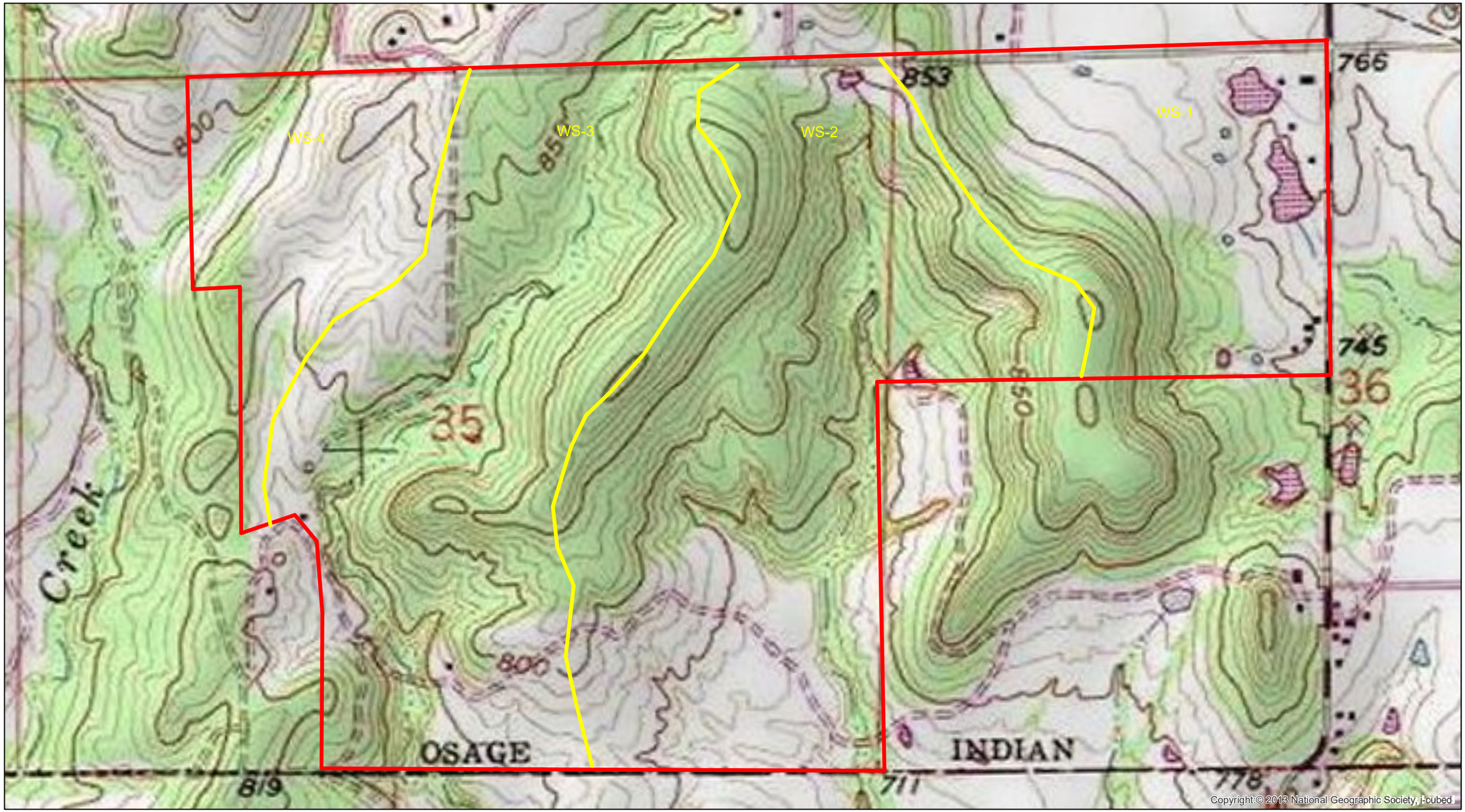


Figure 3. **Topographic Map of AEL Proposed Expansion**
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 285 570 1,140 1,710 2,280 Feet

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SCS ENGINEERS
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Threatened and Endangered Species (TES) Habitat Assessment Report

AEL's Proposed Expansion
Section 35 and 36, Township 20 South
Range 10 East
Osage County, Oklahoma

American Environmental Landfill
207 North 177th West Avenue
Sand Springs, Oklahoma
(918) 245-7786

SCS ENGINEERS

27216290.00 | July 3, 2018
Revised April 1, 2019

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1.0 EXECUTIVE SUMMARY

SCS Engineers (SCS) has contracted with American Environmental Landfill (AEL) to complete a threatened and endangered species (TES) habitat assessment for a proposed western expansion of an active landfill located northwest of Sand Springs, Osage County, Oklahoma. AEL is in the planning stage of expanding their operations by constructing future cells west of their current landfill. The proposed expansion (subject site) would include the purchase and permitting of land adjacent to their western property boundary. The purpose of the TES habitat assessment is to evaluate the potential presence of state and/or federally listed TES and their associated habitats within the subject site and help determine if potential impacts to protected species may occur as a result of the proposed expansion development.

The following species were identified by the United States Fish and Wildlife Service (USFWS) as potentially occurring within or near the subject site:

- Northern Long-Eared Bat (*Myotis septentrionalis*)
- Least Tern (*Sterna antillarum*)
- Piping Plover (*Charadrius melodus*)
- Red Knot (*Calidris canutus rufa*)
- Whooping Crane (*Grus americana*)
- American Burying Beetle (*Nicrophorus americanus*)
- Rattlesnake-Master Borer Moth (*Papaipema eryngii*)

A review of bird species that are protected under the Migratory Bird Treaty Act of 1918 (MBTA) and the Bald and Golden Eagle Protection Act of 1940 (BGEPA) identified three additional species that are a conservation priority and may utilize the habitat within the subject site. These three species include the:

- Bald Eagle (*Haliaeetus leucocephalus*)
- Harris's Sparrow (*Zonotrichia querula*)
- Red-headed Woodpecker (*Melanerpes erythrocephalus*)

A desktop review was performed to evaluate the potential presence of state or federally listed TES and their habitats within the subject site. An on-site field investigation was completed May 24th - 25th, 2018 to verify if suitable habitat was present for TES within the subject site. Potential suitable habitat was observed within the subject site for three TES species including:

- Northern long-eared bat,
- American burying beetle (ABB)
- Rattlesnake-master borer moth

In addition, suitable habitat for all three MBTA/BGEPA listed species was observed within the subject site.

2.0 PROJECT OVERVIEW/INTRODUCTION

The State of Oklahoma solid waste permitting process requires that consultation with the United States Army Corp of Engineers (USACE) be completed prior to state approval. Clearance from the USFWS is also required for projects on federal lands, federally funded projects, and projects that require federal permits or approvals including prior approval for any USACE 404/401 permit. A wetland determination report for the subject site has been completed under a separate cover, which will help determine if impacts to Waters of the United States (WOUS) may occur as a result of the proposed.

This document provides information that aids in compliance with Section 7(a) of the Federal Endangered Species Act (ESA) and the Oklahoma Endangered Species Statute. These regulations are enforced by the USFWS and the Oklahoma Department of Wildlife Conservation (ODWC), respectively.

The following report discusses the findings and conclusions of a background published documentation review and an onsite field inspection for potential impacts to TES and their associated habitats within the proposed subject site.

3.0 SCOPE

3.1 PUBLISHED DOCUMENTATION REVIEW

A review of publically available information including USFWS Information for Planning and Consultation (IPAC) records, an official species list from the USFWS, ODWC TES list by county, aerial imagery, National Wetlands Inventory (NWI) maps, United States Geological Survey (USGS) topographic maps, and USGS Land Cover Data were reviewed to evaluate the potential presence of state or federally listed TES and their associated habitats within or adjacent to the subject site.

3.2 FIELD PROCEDURES

SCS Engineers conducted an onsite field investigation to determine if suitable habitat for state or federally listed TES is located within the subject site. A literature review of TES and their habitat preferences was completed prior to staff's field visit. Field investigation was conducted May 24th – May 25th, 2018 in concurrence with a preliminary wetland determination that has been summarized in a report being submitted under separate cover. In addition, an updated literature review was completed in March 2019 to supplement AEL's formal request to the USFWS for a project review.

SCS staff traversed the subject site from the north to the south to assess the different types of habitats, land features, vegetative cover, and soil features potentially suitable for the identified TES; existing habitats were assessed to determine if the area could be used by one or more of the identified TES. To maximize coverage of the heavily wooded areas with limited visibility, SCS staff dispersed and traversed up and down slopes. Habitats were qualified but not quantified for TES use. As this was a preliminary assessment of potential habitats, determination if potentially usable habitat by TES was the primary concern. The different observed habitats are discussed in more detail below.

4.0 PROJECT LOCATION AND SITE DESCRIPTION

The subject site includes approximately 435 acres located northwest of the City of Sand Springs, just southwest of the intersection of North 177th W. Avenue and Anderson Road in Osage County, Oklahoma. The subject site is located in Sections 35 and 36, T20N, R10E near Latitude 36.166643, Longitude -96.203007 **(Appendix A, Figure 1)**. The vegetative cover is predominantly mature oak/hickory woodlands with a native grass understory on steep sloping hills. Two drainage ways transect the subject site from north to the south

The subject site is located within the Northern Cross Timbers (Level 4 Ecoregion) of the Cross Timbers (Level 3 Ecoregion) of Oklahoma (Woods, 2005). This region includes a mosaic of oak savanna, scrubby oak forest, and tall grass prairie, which naturally cover the hills, cuestas, and ridges. Tall grass prairie occurs on fine-textured soils derived from limestone or shale. Soils are highly erodible when disturbed. There are two common stream types. A mixture of shaded riffles, runs, and pools that have gravel or cobble substrates characterizes the first. The second stream type has lower gradients and is typically found downstream of the first, it is characterized by wide, shallow, sand-choked channels. Uplands are mantled by Quaternary clayey silt-to-silt clay decomposition residuum, and sandy decomposition residuum. Valleys are veneered with Quaternary alluvium. The area is underlain by Pennsylvanian and Permian-age sandstone, shale, and limestone. Rock outcrops occur where sandstone blocks and boulders often litter hilltops and slopes. Soils consist of sandy and clayey residuum and colluvium overlaying Pennsylvanian sandstone, limestone and shale. The common soil series for uplands in this region include Darnell, Stephenville, Niotaze, Steedman, Coweta, Dennis, Bates, Clarita, Durant, Shidler, Newalla, Harrah, Chigley, and Konawa. The common soil series for floodplains include Verdigris, Port, Pulaski, and Garvin. Native vegetation is a combination of oak-hickory woodland and tallgrass prairie. Woodland areas are dominated by post oak (*Quercus stellate*), and blackjack oak (*Q. marilandica*) while tall grass prairie is dominated by big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*) and Indiangrass (*Sorghastrum nutans*). Current land cover is woodland, grassland, rangeland, pastureland, and limited cropland. The main crops in this region include small grains, grain sorghum, hay and soybeans.

5.0 PUBLISHED DOCUMENTATION REVIEW

A desktop review was performed utilizing USFWS IPAC records, an official USFWS species list, ODWC TES lists by county **(Appendix B),** aerial photographs **(Appendix A, Figure 2)**, National Wetland Inventory (NWI) maps, USGS Topographic maps **(Appendix A, Figure 3)**, and USGS Land Cover Data. These resources were reviewed for the subject site to evaluate the potential presence of state and/or federally listed TES and their habitats within the subject site.

5.1 USFWS IPAC

A review of USFWS IPAC data (2011a) was conducted for the project site to determine the level of potential impacts to TES and their associated habitats **(Appendix B)**. In addition to the preliminary IPAC review, SCS received an official USFWS species list for the proposed project dated March 27, 2019 included in **Appendix B.** TES are protected by federal and state regulations to prevent further decline or extinction of these species. For species that may have the potential to receive impacts from the proposed development, considerations in the planning phase should evaluate ways to avoid, minimize and/or mitigate these potential impacts.

5.1.1 SPECIES LIST

The following species were identified by the USFWS official list as potentially occurring within or near the proposed subject site:

- Northern Long-Eared Bat (*Myotis septentrionalis*)
- Least Tern (*Sterna antillarum*)
- Piping Plover (*Charadrius melodus*)
- Red Knot (*Calidris canutus rufa*)
- Whooping Crane (*Grus americana*)
- American Burying Beetle (*Nicrophorus americanus*)
- Rattlesnake-Master Borer Moth (*Papaipema eryngii*)

The following information provides a description of each species and its habitat requirements.

Northern Long-Eared Bat

The northern long-eared bat is federally listed as threatened. This medium sized bat typically hibernates in caves/rock crevices during the winter months then migrates to wooded areas in the summer where they roost and breed in mature, live trees and snags (NatureServe 2017; USFWS n.d.). This bat species occurs throughout portions of the Ozark highlands and Ouachita Mountains regions of eastern Oklahoma located approximately 50 miles east and 85 miles northwest of the subject site, respectively; there are nine known northern long-eared bat hibernacula with multiple individuals documented at additional cave locations in Oklahoma (ODWC 2017). Specific summer roosting habitat in Oklahoma is generally unknown, but this bat uses a variety of different tree species and frequently switch roosts (every 2-3 days) (ODWC 2017). Northern long-eared bats feed by flying through the understory of forested areas to glean insects from the surfaces of leaves and water. Reproductive females typically give birth to one pup each year/summer and gather in maternity colonies that vary from fewer than five individuals to more than fifty bats. Males and non-reproductive females use both trees and caves as roosts during the summer (ODWC 2017). White nose syndrome

is currently a predominant threat to this species. The northern long-eared bat is dependent on forested areas for summer roosting and foraging, therefore, loss and fragmentation of wooded areas during the summer months could affect this species. The northern long-eared bat may occur within the subject site due to the availability of suitable woodland habitat (e.g. mature canopy with an open understory) and insect/prey.

American Burying Beetle

The American burying beetle (ABB) is federally listed as endangered and is the largest carrion beetle in North America (USFWS 2014b). Historically this species could be found in 35 states but is currently limited to nine states including: Arkansas, Kansas, Massachusetts, Nebraska, Oklahoma, Ohio, Rhode Island, and South Dakota (Ratcliff 1996; USFWS n.d.). The largest populations of ABB are found in Oklahoma where it is currently known to occur in at least 29 counties in the eastern portion of the state (ODWC 2017). This beetle is dependent on small carrion (between 3-7ounces) to feed and reproduce (ODWC 2017). There is no critical habitat designation for this species, but the highest densities of ABB occur in open, oak-hickory forests with native grass cover; populations also occur in both closed-canopy forest and tallgrass prairie habitats. Preferred habitat for the ABB includes areas with loose soils and minimal human disturbance. This species has a short life span of approximately one year. The ABB is dormant (underground) in the winter when temperatures are less than 60 degrees Fahrenheit (˚F). During summer months, the adults are nocturnal and require a minimum nighttime air temperature of 60 ˚F for activity. Eggs are laid between April and September but predominantly in June and July and larvae require 48-60 days to develop (Ratcliff 1996). This species can travel up to two miles in a night and can occur in many undeveloped areas if the food opportunity is present. Soil disturbance from construction projects occurring during the cool/cold weather months are a concern for this species survivability. Based on the known current and historic range for this species, suitable soil conditions, and its ability to travel long distances, this species may occur within and/or adjacent to the subject site.

Whooping Crane

The Whooping Crane is a federally listed endangered species that occurs only in North America. It is North America's tallest bird, with males approaching 5 feet tall when standing erect (USFWS 2011c). The whooping crane adult plumage is snowy white except for black primary feathers, black or grayish alula (specialized feathers attached to the upper leading end of the wing), sparse black bristly feathers on the carmine crown and malar region (side of the head from the bill to the angle of the jaw), and a dark gray-black wedge-shaped patch on the nape (USFWS 2011c). Whooping Cranes are typically found in wetlands, marshes, pond and lake shorelines, shallow rivers, wet prairies, and crop fields near wetlands where they eat a varied diet of insects, crayfish, fish and seeds (ODWC 2011). Although rare, whooping cranes migrate through Oklahoma each spring and fall from their wintering grounds along the Texas Coast to their summer breeding grounds in Canada. The Salt Plains National Wildlife Refuge, located approximately 115 miles northwest of the subject site, is a valuable migration stopover area and is designated critical habitat for this species. The whooping crane is not likely to occur within the subject site due to the lack of suitable wetland or cropland habitat for feeding and loafing.

Red Knot

The Red Knot is a federally threatened species. It is the largest and most colorful of the North American peeps and has the longest yearly migratory route of any North American shore bird (Cornell 2015). This species can migrate from the southern tip of South America (Chile) to the Northern artic regions of North America. This species breeds in the dry, sparsely vegetated tundras of the North American Arctic. Outside of the breeding season, the red knot is found primarily in intertidal and marine habitats. With fewer than five birds reported annually, Oklahoma is not a critical breeding or

staging area for the species (ODWC 2017). The red knot is unlikely to occur within the subject site due to the lack of suitable habitat including marine shoreline and has an infrequent occurrence in the state.

Piping Plover

A federally listed threatened species the Piping Plover is a small shorebird that utilizes open, sand bars, mudflats, salt flats, and shallow wetlands for feeding and nesting (ODWC 2017; USFWS 2011b). Once widespread, this species is currently listed as threatened or endangered throughout its range. The Northern Great Plains population, which includes the Oklahoma population, is currently listed as federally threatened (USFWS 2011a, 2016a). The piping plover is a common spring and fall migrant through Oklahoma including Osage County (USFWS 2017), but there is only one nesting record for this species located in the panhandle of the state (ODWC 2017). Migration for this species in Oklahoma typically occurs from March through May and July through September. This shorebird is unlikely to occur within the subject site due to lack of suitable wetland or shallow riverine habitat with suitable sand/gravel bars for feeding or nesting.

Least Tern

A federally endangered species the least tern is the smallest North American shorebird. This species utilizes large river sandbars, saline flats, and marshes for feeding and nesting (USFWS n.d.). Least terns nest in colonies with peak egg laying from May-June and a completed breeding season by August. For feeding, least terns utilize shallow water areas of lakes, ponds, and rivers typically located close to the nesting areas. Nesting colonies are known from the Salt Plains National Wildlife Refuge in Oklahoma located more than 100 miles northwest of the subject site (ODWC 2017). Although this species is a known migrant in Oklahoma, this shorebird is unlikely to occur within the subject site due to the lack of suitable wetland and/riverine habitat. The thick woodland area and the lack of suitable gravel at the subject site limits this species preferred nesting and migratory habitat stop-overs. The available wetland features would not support the preferred food for offspring or adults due to the lack of extended inundation periods.

Rattlesnake-Master Borer Moth

The Rattlesnake-master borer moth is currently a candidate species for federal listing under the ESA. The candidate designation does not afford this species statutory protection, but candidate species are closely monitored as a conservation priority that may warrant future protection. This moth gets its name from the rattlesnake master plant (*Eryngium yuccifolium*); an herbaceous perennial that occurs in rocky woods, prairies and glades which is host to the moth's larvae. The rattlesnake-master borer moth may be present onsite depending upon the prevalence of the host plant on the subject site.

5.1.2 CRITICAL HAITAT DESIGNATION

Critical Habitat is federally designated and carries legal implications under the ESA. Critical habitats are specific geographic areas with features that are essential to the conservation of TES and may require additional management and protection. A review of state and federally designated critical habitats was conducted for the proposed subject site. Designated critical habitats are not located within the proposed subject site (ODWC 2016b; USFWS 2019).

5.1.3 MIGRATORY BIRDS

Migratory birds are afforded federal protection under the Migratory Bird Treaty Act of 1918 (MBTA) and the Bald and Golden Eagle Protection Act of 1940 (BGEPA). The USFWS has statutory authority and responsibility for enforcing the MBTA and BGEPA. Both acts make it illegal for anyone to take,

possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird/eagle, or the parts, nests, or eggs of such birds except under the terms of a valid permit issued pursuant to federal regulations (USFWS 2016a, 2017). Activities that may result in impacts to migratory birds, eagles and their habitats would need to follow appropriate protection regulations and implement appropriate conservation measures to minimize impacts to these species. Additional permitting may be required for any project that has the potential to disturb migratory birds/eagles. The following MBTA/BGEPA birds are identified by the USFWS IPAC tool as potentially being within or near the proposed expansions:

- Bald Eagle (*Haliaeetus leucocephalus*)
- Harris's Sparrow (*Zonotrichia querula*)
- Red-headed Woodpecker (*Melanerpes erythrocephalus*)

The following information provides a description of each species and its habitat requirements.

Bald Eagle

Although the bald eagle has been removed from the TES list, under the ESA, this species continues to be protected by the MBTA and the BGEPA. Bald Eagles typically breed and winter in forested areas adjacent to large bodies of water. This species often selects large/mature trees that are open and accessible for roosting and nesting. The Bald Eagle is an opportunistic forager that may travel up to 50 miles in search of carrion, fish, bird, and mammalian prey. Some major threats to Bald Eagles include degradation of shoreline habitat, and disturbance at nest and roost sites. Eagles typically winter in Oklahoma from November through the end of March and are a common sight at large lakes and reservoirs including Kaw, Keystone, Texoma, Tenkiller, Ft. Gibson, Grand, Canton, Great Salt Plains, Tishomingo and Spavinaw lakes (ODWC 2016a, 2017). The subject site is located approximately 2.5 miles east of Keystone Lake, a known location for migrating and wintering bald eagles in Oklahoma. A Bald Eagle nest is along the north side of the Arkansas River approximately two miles southeast of the AEL entrance. Bald Eagles may occasionally occur foraging within the subject site, but are not anticipated to be adversely impacted by the proposed project due to the lack of suitable riverine habitat within the proposed expansions.

Harris's Sparrow

The Harris's Sparrow is the largest sparrow in North America and has a distinguishable black bib and pink bill. This species is a common favorite at backyard birdfeeders but is declining throughout its range. Harris's sparrows are winter residents and found nearly statewide in Oklahoma from mid-October to early May. This species is a non-breeding resident in Oklahoma and therefore would not breed within the subject site. Habitat descriptions for their winter range include: thickets/brush bordering streams, edges of low woodlands, brush and brushy places, hedgerows, and willow thickets in ravines (NatureServe 2017). The Harris's sparrow is primarily a ground feeder with a varied diet that includes insects, fruits and grains. The global status for this species is designated as G5, Secure (NatureServe 2017). This species likely occurs within the subject site during fall and winter due to the availability of suitable woodland habitat and known records on the area.

Red-headed Woodpecker

The red-headed woodpecker is a robin-sized woodpecker with a distinguishable and entirely red head (ODWC 2017). This species is frequently confused with the red-bellied woodpecker, which only has red plumage potions of the top and back of the head. Red-headed woodpeckers typically occur in mature oak woodlands, orchards and riparian woodlands with a relatively open understory particularly near creeks and ponds. They have a varied diet that includes insects, fruits, seeds and tree nuts such as acorns. Dead trees and snags along woodland perimeters provide valuable nesting habitat for this

species (Cornell 2015). They are uncommon in urban or residential neighborhoods. This species can be found breeding statewide in Oklahoma during the summer. In the winter, this species can be found across the eastern ¾ of Oklahoma; their winter numbers vary greatly from year to year depending upon acorn production and weather (ODWC 2017). The species is also listed as "Near Threatened" on the International Union for Conservation of Nature (IUCN) Red List (NatureServe 2017). This species likely occurs year-round within the subject site due to the availability of suitable woodland habitat for breeding, foraging and winter cover.

5.2 OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

The ODWC also maintains lists of state and federally listed TES for each county. According to the ODWC County list, there are no state listed TES or designated critical habitats in Osage County Oklahoma (ODWC 2016c). See also **Appendix B** for the ODWC County list.

5.3 AERIAL PHOTOGRAPH REVIEW

Aerial photographs dated 2018-2015, 2013-2010, 2008, 2006-2003, and 1995 were reviewed using Google Earth Pro Inc. (Google Earth 2018). Aerial photographs were reviewed to identify the proposed project expansion site and potential TES habitat located within or in close proximity to the subject site. Landscape features visible on aerial imagery within the subject site include woodland vegetation and grassland areas with multiple ponds of varying sizes. The subject site also contains some developed areas including two abandoned farmsteads and an access road that transects the subject site from the northeast to southwest **(Appendix A, Figure 2)**.

5.4 USGS TOPOGRAPHIC MAP REVIEW

The USGS 7.5 Minute Topographic Quadrangle (Wekiwa, Okls. Quadrangle, 1958,) indicates that the elevation ranged from 930 feet above mean sea level (amsl) near the north central area of the subject site to approximately 730 feet amsl near the southeast corner of the subject site. The topographic surface is represented as hills and valleys of two intermittent stream drainage ways. Three water features that include two intermittent streams and a freshwater pond are mapped within the subject site **(Appendix A, Figure 3)**.

5.5 NATIONAL WETLANDS INVENTORY MAP REVIEW

SCS conducted a NWI review for preliminary determination of the presence, location, size, and type of wetlands potentially located entirely or partially within the subject site. The U.S. Fish and Wildlife Service (USFWS) generates NWI maps through aerial imagery review, which may not accurately depict the extent or location of wetlands in an area. According to NWI data (USFWS, 2016b), thirteen mapped wetlands are located within the boundary of the subject site. These wetlands are identified as:

WS-1 NWI Features

1. **NWI-1**: A 0.19 Acre PUSCx (Palustrine, Unconsolidated Shore, Seasonally Flooded, Excavated) freshwater pond located near the north-center of the WS-1 Subject Site area.
2. **NWI-2**: A 0.20 Acre PUSCx freshwater pond located near the south-center of the WS-1 Subject Site area.
3. **NWI-3**: A 1.34 Acre PUBFh (Palustrine, Unconsolidated Bottom, Semipermanently Flooded, Diked/Impounded) freshwater pond located near the northeast corner of the WS-1 Subject Site area.

4. NWI-4: A 1.77 Acre PUBHh (Palustrine, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded) freshwater pond located near the eastern Subject Site boundary, south of the 1.34 Acre PUBFh freshwater pond.
5. NWI-5: The northwest end of a 2.44 Acre R5UBF (Riverine, Unknown Perennial, Unconsolidated Bottom, Semipermanently Flooded) riverine habitat that begins at the southwest side of the previously discussed 1.77 Acre PUBHh freshwater pond. This riverine feature traverses off the Subject Site toward the southeast.
6. NWI-6: A 0.22 Acre PUBFh freshwater pond located adjacent to the southern Subject Site boundary.
7. NWI-7: A 0.20 Acre PUBFh freshwater pond located adjacent to the southern Subject Site boundary and west of the previously identified 0.22 Acre PUBFh freshwater pond.

WS-2 NWI Features

1. NWI-8: A 8.16 Acre R5UBF riverine feature located along the western third of the Subject Site running generally from the north to the south of the Subject Site.
2. NWI-9: A 0.25 Acre PUSCh (Palustrine, Unconsolidated Shore, Seasonally Flooded, Dike/Impounded) freshwater pond located near the north border of the Subject Site.
3. MW-10: A 0.22 Acre PUBFh freshwater pond is located near the center of WS-2 along the east slope.
4. NWI-11: A 0.11 Acre PUSCh freshwater pond located near the southeast corner of the subject site.

WS-3 NWI Features

1. NWI-12: A 6.33 Acre R5UBF riverine feature located along the eastern third of the Subject Site running generally from the north to the south of the Subject Site.

WS-4 NWI Features

1. NWI-13: A mid portion of a 6.21 Acre R5UBF riverine feature along the northwest corner of the WS-4 Subject Site Area.

All of the NWI mapped freshwater ponds appear to be excavated/impounded. A wetland determination/delineation report has been completed for the subject site and submitted under separate cover.

5.6 LAND USE LAND COVER

The USGS National Gap Analysis Program (GAP) Land Cover Data (2018) was reviewed to assess general land use and land cover within the subject site. Land cover data indicates that the subject site is dominated by forest/woodland vegetation with small scattered areas of introduced and semi-natural vegetation as well as developed areas (roads) and limited open water. The dominate vegetation within the subject site is described by the GAP as Crosstimbers Oak Forest and Woodland.

6.0 FIELD INVESTIGATION

SCS conducted an on-site field assessment May 24th - 25th, 2018 to evaluate the potential habitat for TES within the proposed subject site. A general assessment of landscape features, vegetative cover, and soils was conducted to characterize and categorize habitats observed and to evaluate the potential presence of listed species and/or their associated habitat.

6.1 OBSERVED HABITATS

The subject site includes a variety of land cover types including woodland, grassland, wetlands, and developed areas. Descriptions of each general habitat type are provided below.

6.1.1 WOODLAND

Most of the subject site is dominated by native oak woodland savannah habitat. Woodland areas are composed predominantly of oak species including blackjack oak (*Quercus marilandica*), Chinquapin Oak (*Q. muehlenbergii*), and post oak (*Q. stellata*) with some hickory (*Carya sp.*) and increasing cover of eastern red cedar (*Juniperus virginiana*). Lowland woodlands were comprised of a higher diversity of tree species including: American elm (*Ulmus americana*), hackberry (*Celtis occidentalis*), plains cottonwood (*Populus deltoides*), willow (*Salix spp.*), walnut (*Juglans spp.*), ash (*Fraxinus pennsylvanica*), sycamore (*Platanus occidentalis*) as well as other tree species. The aforementioned list of identified trees is not inclusive off all tree species within the subject site.

The woodlands were predominantly tall mature trees with generally an open understory. Woodland areas are located along in the east slope of the NE1/2 of the subject site, the western slope of the eastern watershed and all of the western watershed. Individual trees occurred within and around rock outcrops as well as along steep slopes, valleys and hill tops. The ground cover within the woodlands consisted of sparse vegetative cover mixed with prominent leaf litter. The woodlands were predominantly undisturbed and could provide suitable habitat for the Norther Long-Eared Bat. Several areas within the woodlands have soft silt-sandy soils that ABB would be able to utilize if proper prey opportunities were present.

AEL's operations, not including the active placement of solid waste, uses a portion of the subject site for facility equipment storage and to transport soil and equipment. An area that has had extensive tree removal completed is located inside of an access road used by AEL. The access road can be seen in aerial photographs beginning west of a large soil stockpile in the south ½ of the NE ¼ of the subject site. This access road traverses to the south along the west valley side of the east drainage. This access road then turns east near the middle of the SE ¼ of the subject site. This area was heavily wooded prior to 2013 but appears to have been thinned prior to 2015. This thinned area is currently a combination of scattered mature trees within a lowland grassland. This grassland area will be discussed below. Aside from this thinned area, the woodlands within the subject site had a uniform cover only broken by two access roads and two homestead structures.

6.1.2 GRASSLAND/RANGELAND

Grassland species observed within the subject site includes both native and introduced species. Dominant grassland species observed within the subject site includes: little bluestem, indian grass, Johnson grass (*Sorghum halepense*), and broomsedge bluestem (*Andropogon virginicus*). Two types of grasslands were observed within the subject site. A short grass vegetative community was observed along the tops of hills within breaks of the tree canopy; the soils in these areas were shallow and rocky.

The second type of grasslands were found in lowlands including the fore mentioned thinned woodland area. A mixture of tall and short grass prairie species with some invasive species dominated these lowland plant communities. Soils in these areas were loose and relatively thick with minimal rock within the soil profiles. Soils in lowland areas were often a combination of silt loam and sand. Small areas that had sparse vegetative cover often had erosional rills in these lowland areas. The observed grasslands were predominantly undisturbed and would provide suitable habitat for the Rattlesnake-Master Borer plant, which the Rattlesnake-Master Borer Moth are dependent on, and soils that are preferable to the ABB.

6.1.3 WETLANDS AND WATERCOURSES

The subject site is comprised of four watersheds associated with channels that typically drain from the north to the south. The east watershed includes a portion of AEL's active landfill operations and the west watershed is dominated by a mature woodland area. A USACE approved jurisdiction determination identified three stream channels and one pond that are jurisdictional. The jurisdictional channels are a combination of ephemeral and intermittent. The east channel will be impacted while the two west channels will remain undisturbed from the proposed expansion. The jurisdictional pond will remain undisturbed from the proposed expansion and mitigation.

A review of the NWI and NHD identified the four jurisdictional features. Observed hydric habitats ranged from permanent pools with true aquatic plants, fish, and benthic species to sparse hydric vegetative cover near surface water under a woodland canopy. Both west stream segments had sunfish species including green sunfish (*Lepomis cyanellus*) and bluegill (*L. macrochirus*). Mayflies (Ephemeroptera) and dragonfly nymphs (Odonata) in isolated pools along intermittent stream channels. Wetland plants were dominated by broadleaf cattail (*Typha angostifolia*), knot weed (*Persicaria bicornis*), coon's tail (*Ceratophyllum demersum*), green ash tree, and black willow (*Salix nigra*).

For additional information regarding wetland areas and watercourses within the project corridor, please reference the wetland delineation report prepared under separate cover.

7.0 OBSERVED TES AND/OR ASSOCIATED HABITATS

Numerous wildlife species were observed during the field investigation including but not limited to turkey vulture (*Cathartes aura*), white-tailed deer (*Odocoileus virginianus*), nine-banded armadillo (*Dasypus novemcinctus*), cottontail rabbits (*Sylvilagus floridanus*), northern bobwhite quail (*Colinus virginianus*), multiple songbird species, and snake species. Incidental occurrences of threatened, endangered or candidate species were not observed during the field assessment. However, this does not preclude the potential that a listed species could utilize suitable habitat within the subject site. The presence of potentially suitable habitat for TES was assessed based on the documentation reviewed and verified during field assessment. Table 1 below indicates the likelihood of TES occurring within the subject site based on SCS's assessment of publically available resources (documentation review) and on-site field observations. Species considered possible or likely to occur within the subject site are discussed in greater detail below the table. For those species that suitable habitat was not observed during the site visit and identified in the table as unlikely will not be discussed further.

Table 1: Likelihood of TES Occurrence within the Subject Site

Common Name	Federal Listing	Likelihood	Rationale
Northern Long-Eared Bat	Threatened	Possible	Suitable woodland habitat present
American Burying Beetle	Endangered	Likely	Suitable sandy-silty soils habitat present and subject site is located within the core of this species' population range
Whooping Crane	Endangered	Unlikely	Significant suitable habitat not present
Red Knot	Endangered	Unlikely	Significant suitable habitat not present and species has not been documented in this region in recent years
Piping Plover	Threatened	Unlikely	Significant suitable wetland habitat not present
Least Tern	Endangered	Unlikely	Significant suitable wetland habitat not present
Rattlesnake-Master Borer Moth	Candidate	Possible	Suitable prairie and woodland habitat present
Bald Eagle	MBTA and BGEPA	Possible	Significant suitable habitat not present, but occurs in large numbers at Keystone lake located 2.5 miles west of subject site and documented occurrence in vicinity of subject site
Harris's Sparrow	MBTA	Likely	Documented occurrences in vicinity and suitable habitat present
Red-headed woodpecker	MBTA	Likely	Documented occurrences in vicinity and suitable habitat present

7.1 NORTHERN LONG-EARED BAT

The northern long eared bat utilizes a variety of tree species in woodland areas as warm season roosts from mid-March through mid-October. Potential suitable woodland habitat for the northern long eared bat, was observed within the subject site during the desktop review and was confirmed during the field investigation. The northern long-eared bat could use the subject site for foraging, brood rearing and summer roosts. During the winter months, this species is not expected to occur within the subject site. SCS understands that during the period from mid-March through mid-October, the removal of trees within the woodlands could have an impact to northern long-eared bat individuals. Tree removal after mid-October and before mid-March should have little to no impact to individuals. If trees are removed during this period, no permit should be required.

If tree removal is necessary between mid-March through mid-October, there are options that help determine if the northern long-eared bat is present and could be impacted from tree removal. These options include:

1. conducting an acoustic monitoring survey that will help identify if high frequency myotis bat species are present
    a. if monitoring results indicate that high frequency myotis species are present then
        i. conduct a mist netting to help confirm the presence of protected species
            1. If protected species are captured and observed then mitigation for habitat impacts (tree removal) will likely be required
            2. If no protected species are captured then tree removal may proceed without a mitigation
        ii. Mitigation for habitat impacts based on the higher probability that protected species are present (no true confirmation)
    b. If acoustic monitoring results indicate that no high frequency species are present then tree removal may likely occur without mitigation requirements
2. Mist netting to identify bat species present to determine if protected species are present.
    a. If protected species are captured and observed then mitigation for habitat impacts (tree removal) will likely be required
    b. If no protected species are captured then tree removal may likely proceed without mitigation
3. Mitigate for potential impacts to protected bat species – regardless if bat species are present or not.

Regardless of the option, coordination with USFWS and ODWC is recommended to assure that an approved assessment plan meets with the agencies' oversite authority. The assessment option(s) chosen will determine the level of permitting that may be necessary to complete facility expansion. Construction activities, particularly tree clearing and/or ground disturbance, should be avoided until agency coordination and project review is complete.

7.2 AMERICAN BURYING BEETLE

There is no critical habitat designation for this species, but the highest densities of ABB occur in open, oak-hickory forests with native grass cover; populations also occur in both closed-canopy forest and tallgrass prairie habitats. The ABB prefers loose soils in areas with minimal human disturbance. Soil disturbance from construction projects are a concern for this species. Potential suitable habitat for this species was observed within the subject site during the field investigation. In addition, multiple records for the ABB are currently known for Osage County, Oklahoma. With potential habitat identified within the subject site and historical collections from the area, development from the proposed

expansion could have detrimental impacts to ABB individuals. To determine if ABB individuals are present within or near the subject site, SCS recommends an ABB presence/absence assessment be completed prior to any natural habitat disturbance. Because of their highly mobile capabilities, annual monitoring needs to be completed prior to any scheduled ground disturbance. Based on the ABB life cycle, monitoring for ABB would need to be completed between May 20 and September 20 (or when evening temperatures are consistently over 60°F). ABB monitoring in Oklahoma is divided into two sample periods. The first monitoring period is from May 20th through July 28th. This monitoring period provides results for potential disturbances that will occur within this period. The second monitoring period is from July 29th through September 20th. Results from this second monitoring period provide impact results from July 29th until May 20th of the following year. Monitoring results are good for only those dates discussed. Depending on the result of the ABB survey, an incidental take permit may be required prior to development of the subject site. Mitigation may be required as part of securing the incidental take permit. Coordination with USFWS and ODWC is recommended to avoid potential unauthorized impacts to this species. Construction activities that include soil compaction, soil disturbance and ground clearing should be avoided until agency review and approval is obtained.

7.3 RATTLESNAKE-MASTER BORER MOTH

The rattlesnake-master borer moth occupies a unique ecological niche associated specifically with the rattle snake master plant. This species is typically found in mesic prairies, glades and rocky woodlands where it blooms from May through August. Although the rattle snake master plant was not observed during the SCS site assessment, potential suitable habitat for this species was observed within the subject site.

SCS acknowledges that this species may be impacted from development activities associated with the proposed expansion. However, as a candidate for federal listing this species is not offered enforceable protection under the ESA. Nonetheless, SCS recommends that coordination with the USFWS be established to minimize impacts to this species. This plan would help minimize impacts to the rattlesnake-master borer moth while allowing for the continual development of the proposed expansion.

7.4 BALD EAGLE, HARRIS'S SPARROW AND RED-HEADED WOODPECKER

The bald eagle, Harris's sparrow, and red-headed woodpecker are not listed as TES but are afforded federal protection under the MBTA and/or the BGEPA. These species are currently known to occur in Osage County and utilize a variety of habitats observed within and adjacent to the subject site including woodlands. A bald eagle nest was observed by SCS Staff along the Arkansas River approximately two miles southeast of the subject site. The Harris's sparrow does not nest within the region but are winter residents. The red-headed woodpecker is known to both breed and winter within woodland areas of Osage County, Oklahoma. As a year round resident the redheaded woodpecker may be the most adversely impacted by construction activities associated with the subject site. Preliminary USFWS consultation guidance indicates that the red headed woodpecker breeds in this area from May 10 through September 10. Therefore, SCS recommends construction activities be conducted outside these nesting dates in areas of suitable habitat for the red-headed woodpecker. If individuals from these species are observed during construction activities, it is recommended that construction activities cease until the individuals vacate the area. If construction activities occur during the nesting period of the red-headed woodpecker, an active nest survey may need to be completed prior to further construction activities. SCS recommends that coordination with USFWS and ODWC be initiated

regarding these species so as to avoid potential impacts to these and other migratory bird species that may occur within the subject site.

8.0 CONCLUSION

A review of state and/or federally listed TES and designated critical habitats was conducted for the subject site. No designated critical habitats for TES are located within the subject site. However, the USFWS and ODWC list seven federally threatened, endangered, and/or candidate species which may occur within the proposed subject site including:

- Northern Long-Eared Bat
- Least Tern
- Piping Plover
- Red Knot
- Whooping Crane
- American Burying Beetle
- Rattlesnake-Master Borer Moth

For each species, an estimated level of impact that would result from the proposed expansion activities was determined based on their habitat preferences, diet, reproductive needs, and likelihood to occur within the subject site. In addition to the TES, the USFWS lists three additional migratory bird species that may occur within the subject site and are protected by MBTA and the BGEPA which include:

- Bald Eagle
- Harris's Sparrow
- Red-headed Woodpecker.

TES were not observed during the site assessment and potentially suitable habitat is not available or limited for the majority of TES species listed for the subject site. Nonetheless, three federally protected TES have the potential to occur within the subject site and include:

- The northern long-eared bat
- American Burying Beetle
- Rattlesnake-master Borer Moth

The potential presence of these three species was based on the availability of suitable habitat and documented species records for the area.

9.0 GENERAL COMMENTS

Conclusions drawn by others from the results of this work should recognize the limitation of the methods used. Please note that SCS does not warrant the work of regulatory agencies or other third parties supplying information used in assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering practices, within the constraints of the client's directives. It is intended for the exclusive use of the client for specific application to the assessed property. No guarantees, express or implied, are intended or made.

10.0 REFERENCES

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Appendix A

Figure 1 - AEL Subject Site Location

Figure 2 – Aerial Photograph of the AEL Subject Site

Figure 3 – Topographic Map of AEL Proposed Expansion

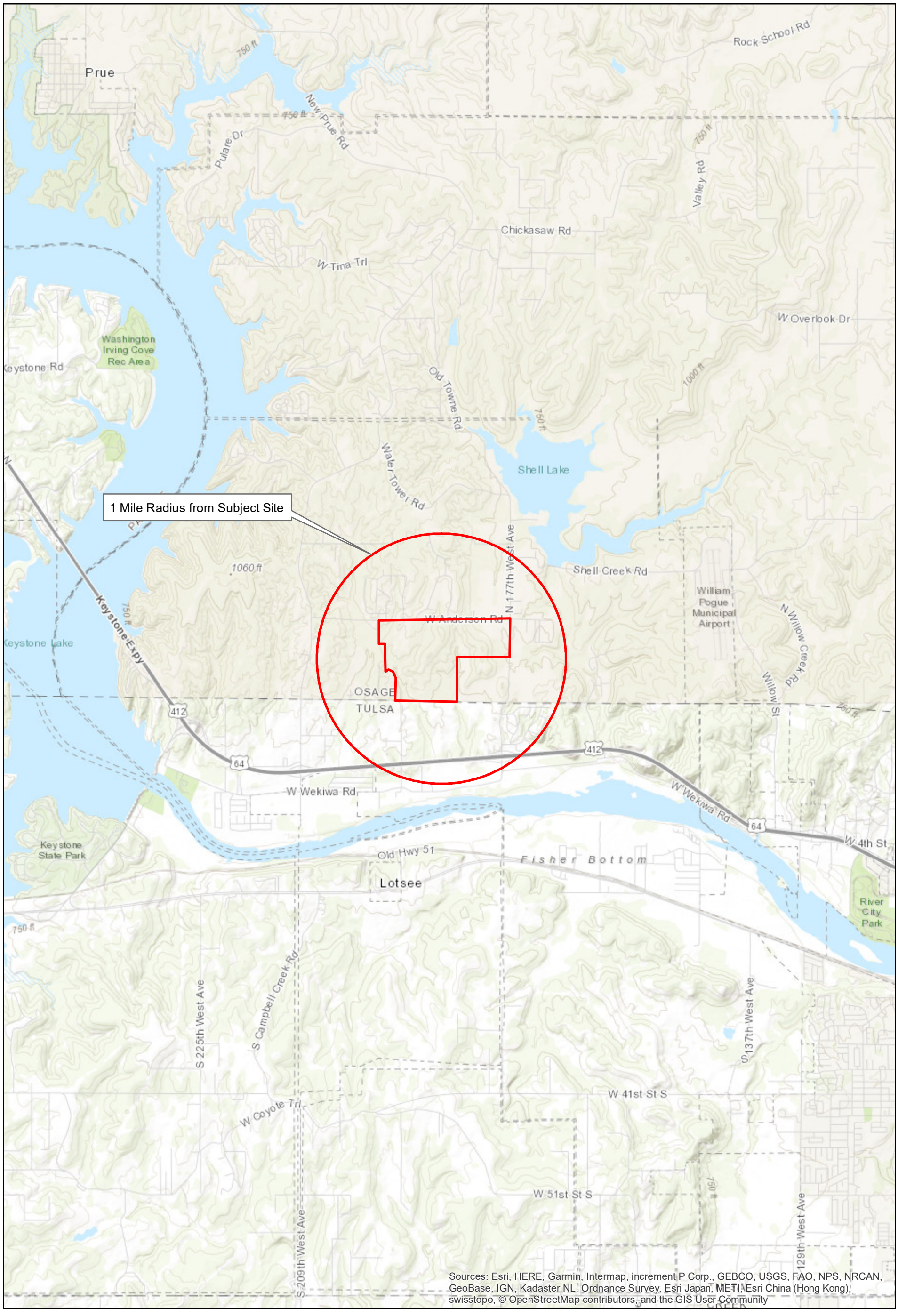

Figure 1.

AEL Subject Site Location
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 3,100 6,200 12,400 18,600 24,800 Feet

N

SCS ENGINEERS

CONSULTING ENGINEERS, INC.
11120 E. 26th St. North, Suite 1100
Wichita, Kansas 67226
PH. (316) 315-4501 FAX. (316) 315-4505

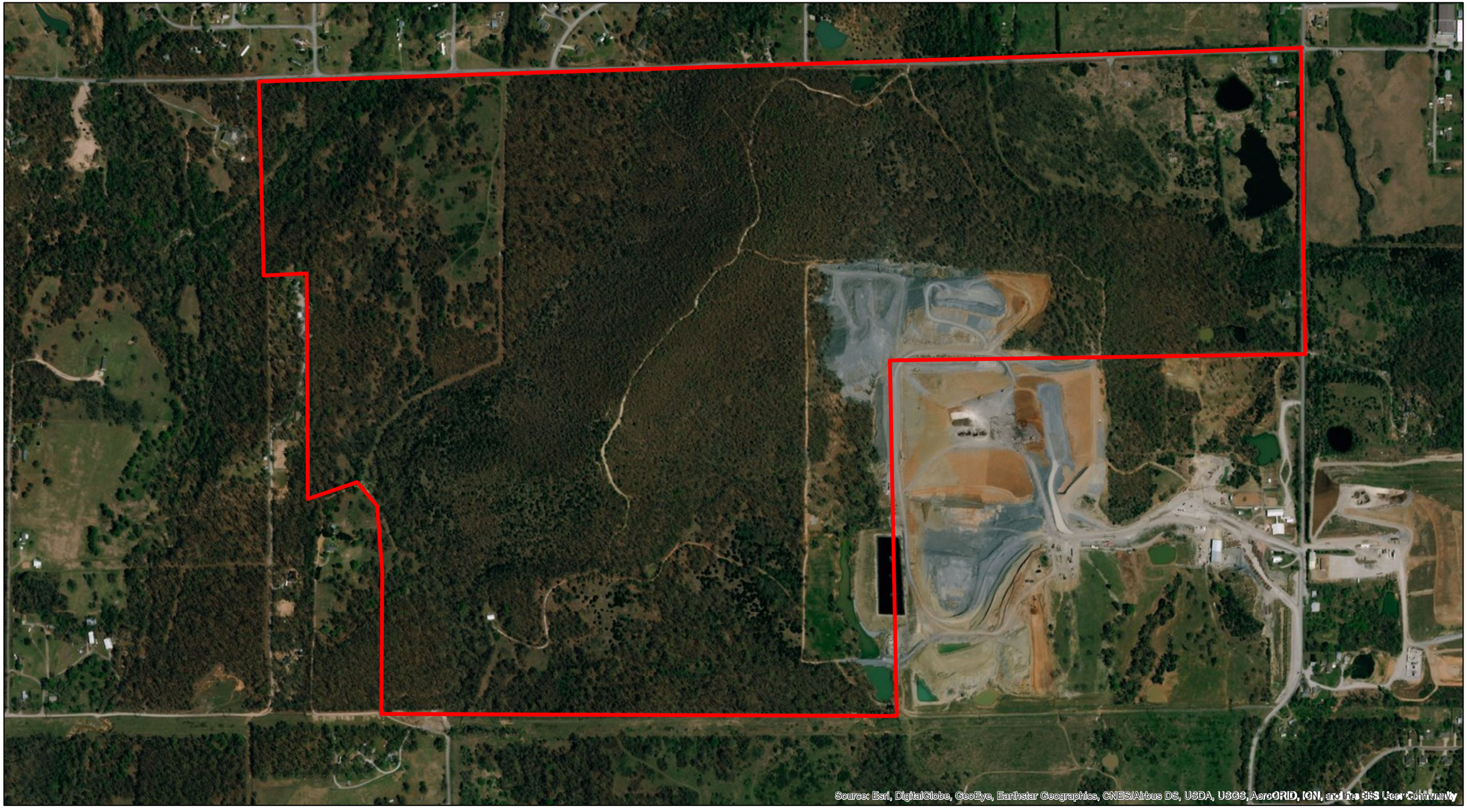

Figure 2. **Aerial Photograph of the AEL Subject Site**
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 315 630 1,260 1,890 2,520
Feet

N

SCS ENGINEERS
CONSULTING ENGINEERS, INC.
11120 E. 26th St. North, Suite 1100
Wichita, Kansas 67226
PH. (316) 315-4501

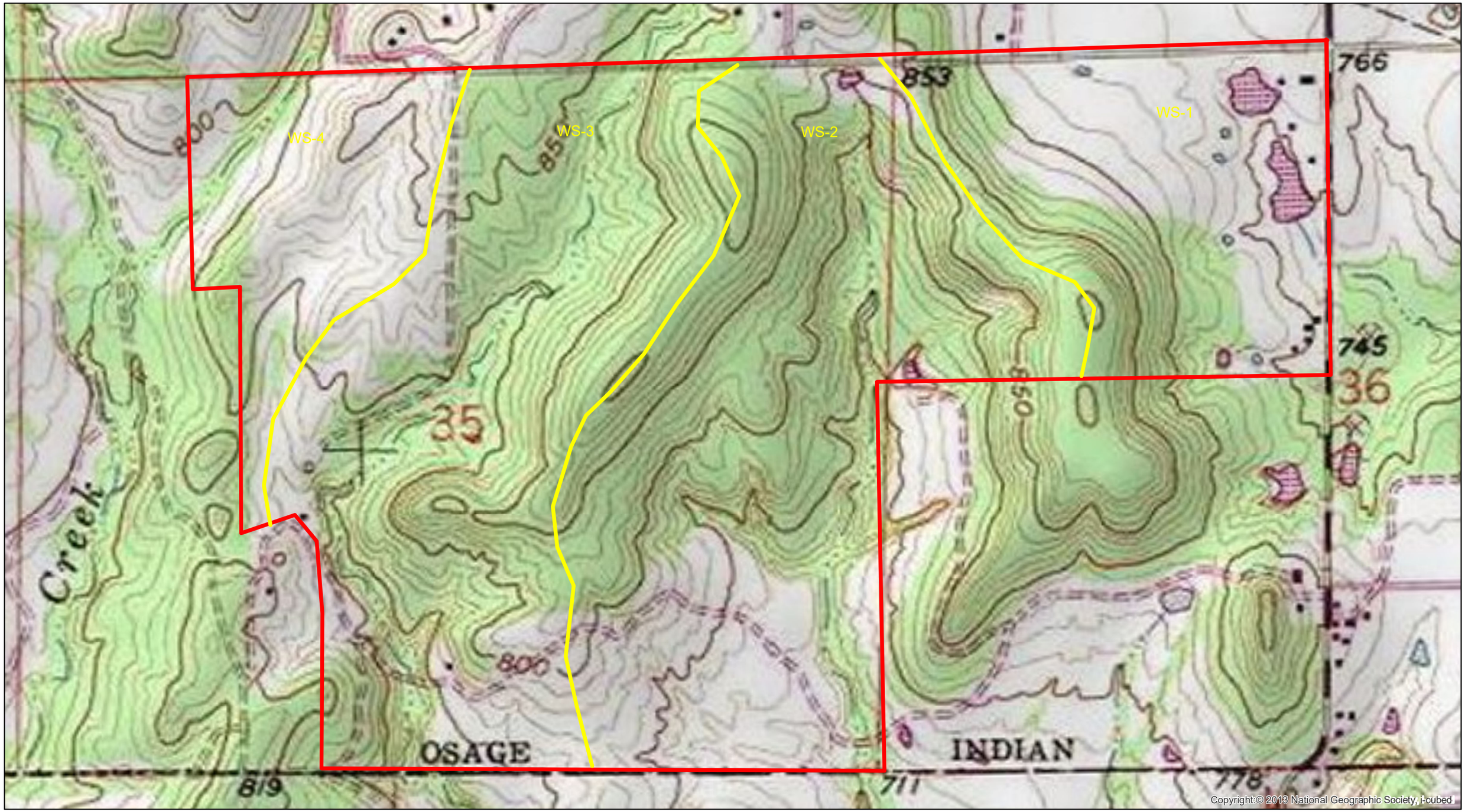

Figure 3. **Topographic Map of AEL Proposed Expansion**
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 285 570 1,140 1,710 2,280 Feet

N

SCS ENGINEERS
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Appendix B

USFWS Official Species List

USFWS IPAC Resource List

ODWC County by County List of Endangered and Threatened Species

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, OK 74129-1428
Phone: (918) 581-7458 Fax: (918) 581-7467
http://www.fws.gov/southwest/es/Oklahoma/

In Reply Refer To:
Consultation Code: 02EKOK00-2019-SLI-1477
Event Code: 02EKOK00-2019-E-03451
Project Name: AEL Expansion

March 27, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Non-federal entities conducting activities that may result in take of listed species should consider seeking coverage under section 10 of the ESA, either through development of a Habitat Conservation Plan (HCP) or, by becoming a signatory to the General Conservation Plan (GCP) currently under development for the American burying beetle. Each of these mechanisms provides the means for obtaining a permit and coverage for incidental take of listed species during otherwise lawful activities.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit through our Project Review step-wise process http://www.fws.gov/southwest/es/oklahoma/OKESFO%20Permit%20Home.htm.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, OK 74129-1428
(918) 581-7458

Project Summary

Consultation Code: 02EKOK00-2019-SLI-1477

Event Code: 02EKOK00-2019-E-03451

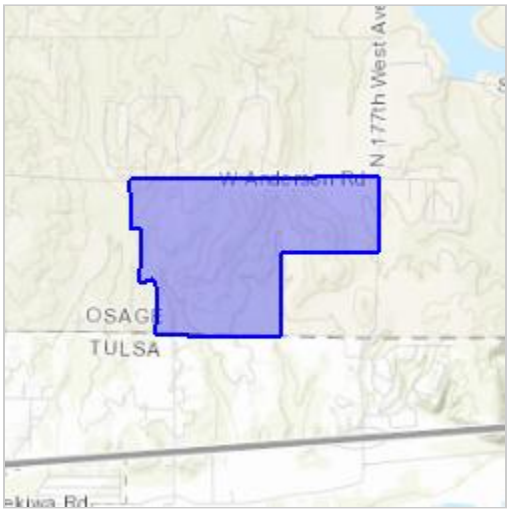
Project Name: AEL Expansion

Project Type: Landfill

Project Description: Landfill Expansion Project

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/36.16725438085243N96.20463310289702W



Counties: Osage, OK | Tulsa, OK

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Least Tern *Sterna antillarum* Population: interior pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8505	Endangered
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

Insects

NAME	STATUS
American Burying Beetle *Nicrophorus americanus* Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/66	Endangered
Rattlesnake-master Borer Moth *Papaipema eryngii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7863	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Harris's Sparrow *Zonotrichia querula* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

NAME	BREEDING SEASON
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

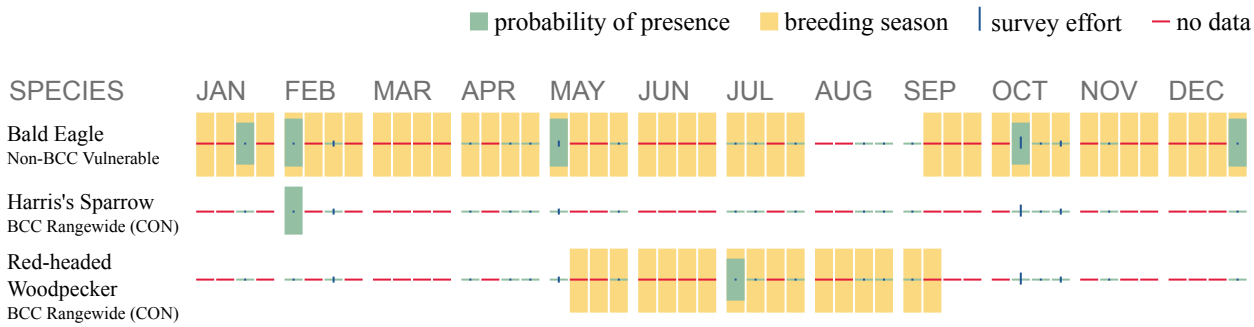
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or

permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In

contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER POND

- PUBFh
- PUSCh
- PUBHh
- PUSCx

RIVERINE

- R5UBF

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

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Location

Osage and Tulsa counties, Oklahoma

Local office

Oklahoma Ecological Services Field Office

(918) 581-7458
(918) 581-7467

9014 East 21st Street
Tulsa, OK 74129-1428

http://www.fws.gov/southwest/es/Oklahoma/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Least Tern Sterna antillarum No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8505	Endangered
Piping Plover Charadrius melodus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot Calidris canutus rufa No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane Grus americana There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/758	Endangered

Insects

NAME	STATUS
American Burying Beetle Nicrophorus americanus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/66	Endangered
Rattlesnake-master Borer Moth Papaipema eryngii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7863	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

You should contact the local field office to determine whether critical habitat for the following species should be considered:

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NAME	TYPE
Whooping Crane Grus americana https://ecos.fws.gov/ecp/species/758#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY

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	BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Harris's Sparrow Zonotrichia querula This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10

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Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence

across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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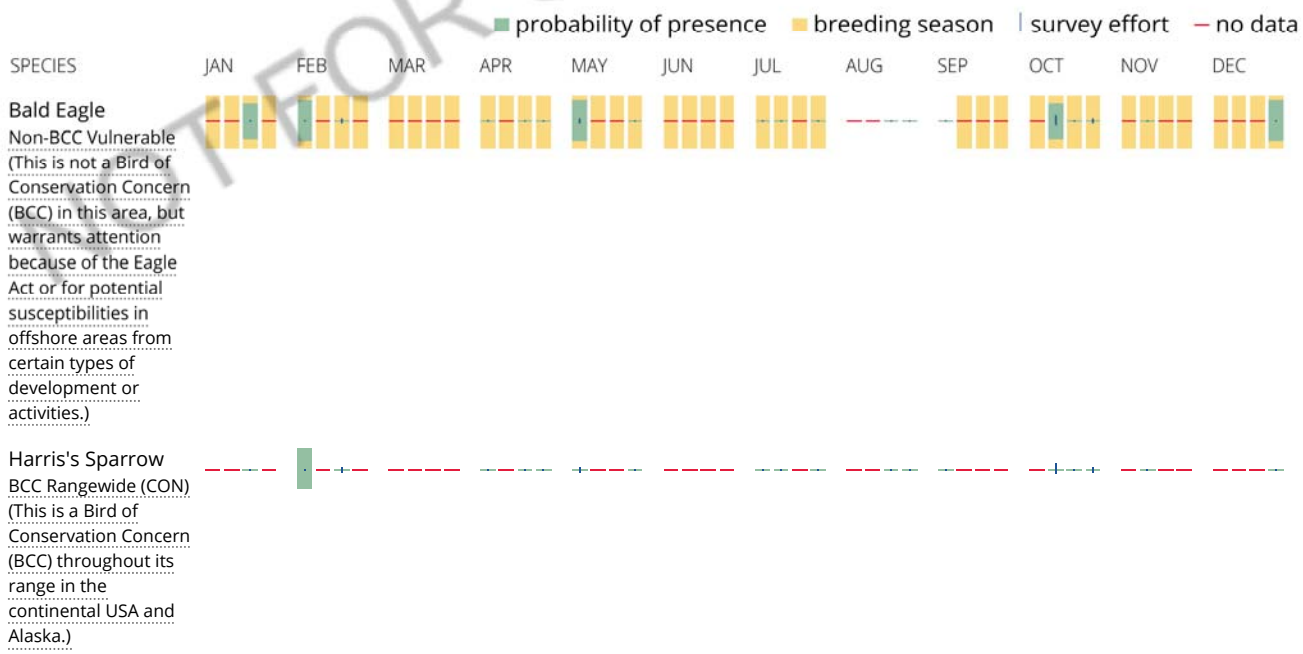

Red-headed Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

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What are the levels of concern for migratory birds?

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Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
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Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

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What if I have eagles on my list?

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER POND

- PUBFh
- PUBHh
- PUSCx
- PUSCh

RIVERINE

- R5UBF

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

NOT FOR CONSULTATION

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

County by County List of Endangered and Threatened Species

Adair County
State-listed Threatened and Endangered Species:
Neosho Mucket (*Lampsilis rafinesqueana*) – endangered
Long-nosed Darter (*Percina nasuta*) – endangered
Black-sided Darter (*Percina maculata*) - threatened

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed threatened and endangered in this county may include:
Gray Bat (*Myotis grisescens*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Ozark Big-eared Bat (*Corynorhinus* (= *Plecotus*) *townsendii ingens*) - endangered

Alfalfa County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Whooping Crane (*Grus americana*) - endangered

Atoka County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
American Burying Beetle (*Nicrophorus americanus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Beaver County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Whooping Crane (*Grus americana*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation

Beckham County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Blaine County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Bryan County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
American Burying Beetle (*Nicrophorus americanus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Caddo County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Canadian County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Carter County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Cherokee County
State-listed Threatened and Endangered Species:

Neosho Mucket (*Lampsilis rafinesqueana*) - endangered

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Gray Bat (Myotis *grisescens*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Ozark Big-eared Bat (*Corynorhinus* (= *Plecotus*) *townsendii ingens*) - endangered
American Burying Beetle (*Nicrophorus americanus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation

Choctaw County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Scaleshell (*Leptodea leptodon*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Cimarron County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation
Mountain Plover (*Charadrius montanus*) – candidate species under evaluation

Cleveland County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Coal County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered

Comanche County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered

Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Cotton County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Craig County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
American Burying Beetle (*Nicrophorus americanus*) - endangered
Neosho Madtom (*Noturus placidus*) – threatened
Piping Plover (*Charadrius melodus*) - threatened
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation

Creek County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Custer County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Delaware County

State-listed Threatened and Endangered Species:

Neosho Mucket (*Lampsilis rafinesqueana*) – endangered
Oklahoma Cave Crayfish (*Cambarus tartarus*) - endangered

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Gray Bat (Myotis *grisescens*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Ozark Big-eared Bat (*Corynorhinus* (= *Plecotus*) *townsendii ingens*) - endangered
American Burying Beetle (*Nicrophorus americanus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Ozark Cavefish (*Amblyopsis rosae*) - threatened
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation

Dewey County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered

Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation

Ellis County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation

Garfield County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Garvin County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Grady County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Grant County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Greer County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Harmon County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Harper County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation

Haskell County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Hughes County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact

the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Jackson County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Jefferson County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Johnston County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Kay County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Kingfisher County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Kiowa County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Black-capped Vireo (*Vireo atricapillus*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Latimer County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

LeFlore County
State-listed Threatened and Endangered Species:

Black-sided Darter (*Percina maculata*) -threatened

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Ouachita Rock Pocketbook (*Arkansia wheeleri*) – endangered
Scaleshell (*Leptodea leptodon*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Leopard Darter (*Percina pantherina*) - threatened

Lincoln County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Logan County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Love County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Major County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Marshall County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Mayes County
State-listed Threatened and Endangered Species:

None

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Gray Bat (*Myotis grisescens*) – endangered
Piping Plover (*Charadrius melodus*) – threatened
Ozark Cavefish (*Amblyopsis rosae*) - threatened
Arkansas Dater (*Etheostoma cragini*) – candidate species under evaluation

McClain County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

McCurtain County
State-listed Threatened and Endangered Species:

Black-sided Darter (*Percina maculata*) - threatened

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Red-cockaded Woodpecker (*Picoides borealis*) - endangered
Ouachita Rock Pocketbook (*Arkansia wheeleri*) – endangered
Scaleshell (*Leptodea leptodon*) - endangered
Winged Mapleleaf (*Quadrula fragosa*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Leopard Darter (*Percina pantherina*) - threatened

McIntosh County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Murray County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered

Muskogee County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Noble County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Nowata County
State-listed Threatened and Endangered Species:

Neosho Mucket (*Lampsilis rafinesqueana*) – endangered; historic occurrence in Verdigris River

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Okfuskee County
State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact

the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Oklahoma County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Okmulgee County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Piping Plover (*Charadrius melodus*) - threatened

Osage County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Ottawa County
State-listed Threatened and Endangered Species:
Neosho Mucket (*Lampsilis rafinesqueana*)

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Gray Bat (*Myotis grisescens*) – endangered
Ozark Big-eared Bat (*Corynorhinus* (= *Plecotus*) *townsendii ingens*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) – threatened
Neosho Madtom (*Noturus placidus*) – threatened
Ozark Cavefish (*Amblyopsis rosae*) - threatened
Arkansas Dater (*Etheostoma cragini*) – candidate species under evaluation

Pawnee County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Payne County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Whooping Crane (*Grus americana*) – endangered

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Pittsburg County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
American Burying Beetle (*Nicrophorus americanus*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Pontotoc County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Pottawatomie County
State-listed Threatened and Endangered Species:
none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Arkansas River Shiner (*Notropis girardi*) – threatened

Pushmataha County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Red-cockaded Woodpecker (*Picoides borealis*) - endangered
Ouachita Rock Pocketbook (*Arkansia wheeleri*) – endangered
Scaleshell (*Leptodea leptodon*) - endangered
Winged Mapleleaf (*Quadrula fragosa*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Leopard Darter (*Percina pantherina*) - threatened

Roger Mills County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation

Rogers County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Seminole County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened

Sequoyah County

State-listed Threatened and Endangered Species:

Long-nosed Darter (*Percina nasuta*) - endangered
Black-sided Darter (*Percina maculata*) - threatened

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Indiana Bat (*Myotis sodalis*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Stephens County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact

the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Texas County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation
Mountain Plover (*Charadrius montanus*) – candidate species under evaluation

Tillman County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Tulsa County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact

the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

American Burying Beetle (*Nicrophorus americanus*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Wagoner County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened

Washington County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Piping Plover (*Charadrius melodus*) - threatened

Washita County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:
Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered

Woods County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation

Woodward County

State-listed Threatened and Endangered Species:

none

Federal-listed Threatened and Endangered Species:

Official county lists of federally threatened and endangered species are maintained by the U.S. Fish and Wildlife Service, the federal agency that administers the Endangered Species Act in Oklahoma. Please contact the U.S. Fish and Wildlife Service for the most accurate and current information. Federally listed endangered and threatened species in this county may include:

Whooping Crane (*Grus americana*) – endangered
Interior Least Tern (*Sterna antillarum*) - endangered
Piping Plover (*Charadrius melodus*) - threatened
Arkansas River Shiner (*Notropis girardi*) – threatened
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) – candidate species under evaluation
Arkansas Darter (*Etheostoma cragini*) – candidate species under evaluation

From: Echo-Hawk, Patricia
To: Weaver, Vaughn
Subject: Re: AEL TES Summary report
Date: Monday, February 10, 2020 9:55:48 AM
Attachments: image001.jpg

========== This message originated outside of SCS Engineers ==========

Greetings Vaughn,

I've reviewed the TES report you recently sent, the survey methods, and the negative results for the presence of T&E species.

The Service concurs with the determination of "not likely to adversely affect" for American burying beetle and Northern long-eared bat. As there is no habitat for the rattlesnake master borer moth, a "no affect" determination is more accurate in this instance.

Thank you for consulting with the Service.

Best Regards,

Patricia D. Echo-Hawk
Fish and Wildlife Biologist
Region 2 Dive Officer

U.S. Fish and Wildlife
Oklahoma Ecological Services Field Office
9014 E. 21st Street
Tulsa, OK, 74129
phone # 918-382-4505
fax # 918-581-7467

Patricia_echo-hawk@fws.gov

Anyone can find the dirt in someone. Be the one that finds the gold.
Only when the last tree has died, the last river poisoned and the last fish caught, will we realize we can't eat money.
-Cree Proverb

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From: Weaver, Vaughn <VWeaver@scsengineers.com>
Sent: Wednesday, February 5, 2020 4:59 PM
To: Echo-Hawk, Patricia
Subject: [EXTERNAL] AEL TES Summary report

Patricia,

I talked with you last week about submitting a TES report for the AEL proposed expansion. After we talked, I learned that there was not a report completed a report was completed.

Now that the report is done, how would you like to receive it. Traditional mail/hard copy with an electronic CD or an electronic copy be sufficient.

Sorry for the delay in getting this report to you.

Vaughn Weaver
Senior Project Professional
[SCS_Engineers_short_bar-small]
11120 E. 26th Street North
Suite 1100
Wichita, Kansas 67226
Office: 316-315-4501
Fax: 316-315-4505
Mobile: 316-207-7130

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Oklahoma Biological Survey

OBS Ref. 2020-090-BUS-SCS

Dear Mr. Weaver, Feb. 6, 2020

We have reviewed occurrence information on federal and state threatened, endangered or candidate species, as well as non-regulatory rare species and ecological systems of importance currently in the Oklahoma Natural Heritage Inventory database for the following location you provided:

Sec. 35 and 36-T20N-R10E, Osage County

We found 16 occurrence(s) of relevant species within the vicinity of the project location as described.

Species Name	Common Name	Federal Status
Sternula antillarum athalassos	**Interior Least Tern**	**Endangered**
County	***TRS***	***Count***
Tulsa	Sec. 12-T19N-R10E	1
Haliaeetus leucocephalus	**Bald Eagle**	**Protected**
County	***TRS***	***Count***
Tulsa	Sec. 2-T19N-R10E	1
Tulsa	Sec. 9-T19N-R10E	1
Tulsa	Sec. 11-T19N-R10E	1
Tulsa	Sec. 12-T19N-R10E	2
Tulsa	Sec. 5-T19N-R11E	1
Tulsa	Sec. 6-T19N-R11E	1
Tulsa	Sec. 7-T19N-R11E	1
Tulsa	Sec. 8-T19N-R11E	1
Tulsa	Sec. 9-T19N-R11E	2
Tulsa	Sec. 10-T19N-R11E	1
Tulsa	Sec. 15-T19N-R11E	1
Osage	Sec. 21-T20N-R10E	1
Osage	Sec. 24-T20N-R10E	1

Additionally, absence from our database does not preclude such species from occurring in the area.

If you have any questions about this response, please send me an email, or call us at the number given below.

Although not specific to your project, you may find the following links helpful.

ONHI, guide to ranking codes for endangered and threatened species:
http://vmpincel.ou.edu/heritage/ranking_guide.html

Information regarding the Oklahoma Natural Areas Registry:
http://www.oknaturalheritage.ou.edu/registry_faq.htm

Todd Fagin
Oklahoma Natural Heritage Inventory
(405) 325-4700
tfagin@ou.edu

Oklahoma Conservation Commission

January 27, 2020
27216290.00

Mr. Brooks Tramell
Director of Monitoring, Assessment and Wetlands Programs
Oklahoma Conservation Commission
2800 N. Lincoln Blvd, Suite 200
Oklahoma City, OK 73105
405-545-6997
Brooks.tramell@conservation.ok.gov

Subject: **Review Wetland Assessment Report for American Environmental Landfill Proposed Expansion.**

Transmitted via e-mail to brooks.tramell@conservation.ok.gov.

Dear Mr. Tramell:

SCS Engineers (SCS) is submitting this request for project review on behalf of American Environmental Landfill (AEL) for a proposed western expansion of an active landfill located northwest of Sand Springs in Osage County, Oklahoma. The Subject Site includes approximately 317 acres in the E1/2 and the E1/2 of the SW1/4 of Section 35, T20N, R10E, near Latitude 36.166643 Longitude -96.203007. See Figure 1 for a more detailed Subject Site boundary.

This request for project review is submitted in conjunction with an application for an Individual Permit (IP) with the U.S. Army Corps of Engineers (USACE). The Bureau of Indian Affairs is also involved in the proposed project due to the location of the Subject site on Osage Reservation Land.

Included with this letter is the completed wetland assessment report. An Approved Jurisdictional Determination (AJD) has been made by US. Army Corps of Engineers for the Subject Site. The IP for this project is accepting the AJD that there are four jurisdictional features that include:

- Three jurisdictional ephemeral stream channels
- One jurisdictional pond

If there are any question or comments regarding the attached reports or figures, please contact:

Vaughn Weaver
1100 E. 26th St. North, Suite 1100
Wichita, KS. 67226
316-494-7518
vweaver@scsengineers.com

Thank you for your time in reviewing these project documents.

Sincerely,

Vaughn Weaver
Senior Project Professional
SCS Engineers

Encl. Figure 1 and Preliminary Wetland Jurisdictional Determination Report SWT-2018-578

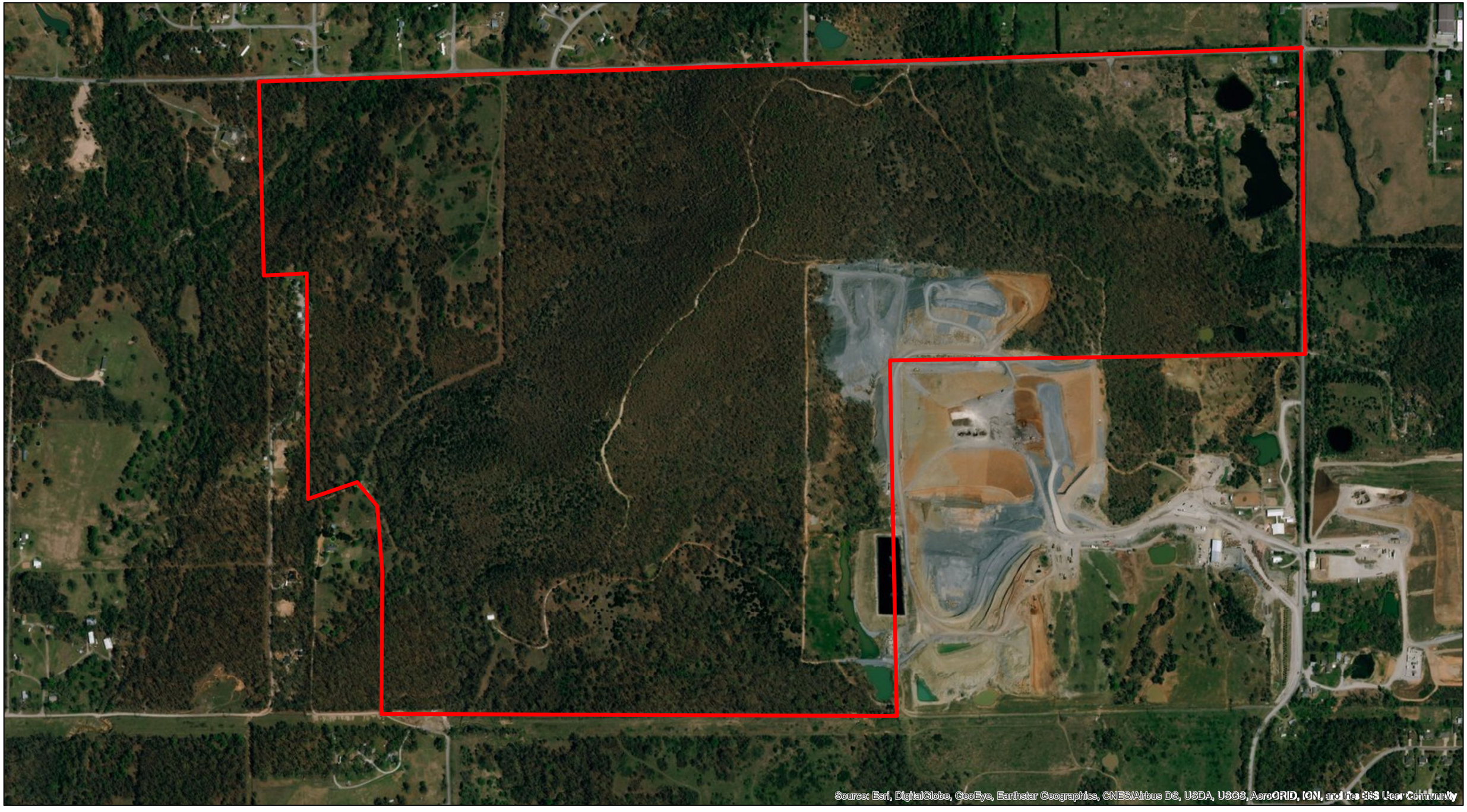

Figure 1. **Aerial Photograph of the AEL Subject Site**
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 315 630 1,260 1,890 2,520
Feet

N

SCS ENGINEERS
CONSULTING ENGINEERS, INC.
11120 E. 26th St. North, Suite 1100
Wichita, Kansas 67226
PH. (316) 315-4501

Preliminary Wetland Jurisdictional Determination Report
SWT-2018-578

American Environmental Landfill Proposed Lateral Expansion
Sections 35 and 36, Township 20 South
Range 10 East
Osage County, Oklahoma

American Environmental Landfill
207 North 177th West Avenue
Sand Springs, Oklahoma
(918) 245-7786

SCS ENGINEERS

27216290.00 | November 26, 2018

1817 Commons Circle, Suite 1
Yukon, Oklahoma 73099
(405) 265 3960

November 27, 2018
File No. 27216290.00

Mr. Marcus Ware
U.S. Army Corps of Engineers
Regulatory Branch
1645 South 101st East Avenue
Tulsa, OK 74128-4629

Subject: **American Environmental Landfill**
SWT-2018-578

Dear Mr. Ware:

On behalf of American Environmental Landfill, SCS Engineers (SCS) is submitting the Preliminary Wetlands Jurisdictional Determination Report for the proposed lateral expansion of the active landfill. We trust that the report includes all of the information sufficient for your review.

If you have any questions or comments, or need additional information, please do not hesitate to contact the undersigned at (405) 265-3960. Thank you for your time and effort in this matter.

Sincerely,

Vaughn Weaver
Senior Project Professional
SCS ENGINEERS

Amy Dzialowski
Project Director
SCS ENGINEERS

cc: Mr. Todd Green – American Environmental Landfill

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1 EXECUTIVE SUMMARY

1.1 PURPOSE

SCS Engineers (SCS) has completed a wetlands determination and delineation for a proposed lateral expansion of the active American Environmental Landfill (AEL) located northwest of Sand Springs, Oklahoma. The proposed lateral expansion would include state required permitting of land adjacent to the west and north of the current AEL permitted boundary for development. As part of the state permitting process, an assessment of jurisdictional waters of the United States (WOTUS) regulated by the U.S. Army Corps of Engineers (USACE) is required. Wetland determination and delineations are part of the assessment process.

For the purpose of this report, wetland(s) are defined as any hydric feature that may be identified as WOTUS and could be subject to USACE jurisdictional authority. These hydric features can include, but are not limited to:

- Rivers, Streams, Creeks
- Swamps, Bogs, Playas, Fens, Marshes
- Ponds, Lakes, Reservoirs

Field identified wetland features are identified as "Potential Wetlands" to denote that they may or may not be under USACE jurisdictional control. Upon request, the USACE will provide jurisdictional determinations (JD) on identified hydric features.

1.2 PROJECT AREA DESCRIPTION

The project area includes approximately 463 acres on the west and north sides of the existing permit boundary (Subject Site) **(Appendix A, Figure 1)**. From the intersection of Anderson Road and N 177th West Avenue in Osage County, OK, the Subject Site extends west approximately 1.3 miles and south approximately 0.83 miles. This described boundary also includes part of the existing AEL permitted operations and is not considered part of the Subject Site. The following insert from Figure 1 indicates the identified Subject Site.

AEL is located 3.25 miles northwest of Sand Springs, Oklahoma. The Subject Site is located in the East 4/5 of Section 35 and the NW 1/4 of Section 36, T20N, R10E near Latitude 36.166643, Longitude -96.203007. The vegetative cover consists predominantly of mature oak/hickory woodlands located on steep sloping hills and grassland/pastures located on flat areas in the northeast and northwest corners of the Subject Site.

Figure 1. The proposed Subject Site.

The Subject Site was divided into four watersheds (WS) for easier discussion of identified features. A review of publicly available data identified thirteen potential wetland features within the Subject Site **(Appendix A, Figure 3)**. There were ten additional mapped wetland features within 0.25 miles of the Subject Site.

1.3 ASSESSMENT

The preliminary wetland determinations were performed in accordance with the USACE Wetlands Delineation Manual (USACE 1987) and the Regional Supplement to the USACE Wetland Delineation Manual: Midwest Region (Version 2.0) (USACE 2010). Evaluations determined if the features met the three USACE wetland criteria:

1. Dominant Hydrophytic Vegetation
2. Hydric Soil Characteristics
3. Presence of Hydrology

Figure 2. The Subject Site with described watershed divisions.

In addition to the physical characteristics that are used to identify wetlands, a significant nexus with WOTUS must exist for these features to be subject to jurisdictional authority of the USACE.

On May 24-25, and August 1-2, 2018 SCS staff conducted field assessments that included wetland determination and edge delineations for fourteen potential wetlands (W-1, W-2, through W-14) and

center of channel delineations for three stream segments (S-1, S-2 and S-3) **(Table 1) (Appendix A, Figure 8)** within the Subject Site. Five features, identified from the desktop review and assessed in the field, failed to exhibit the three required wetland characteristics (D-1 through D-5). Three desktop identified features (NHD 1, NWI 10, and NWI 11) were not assessed during the site visit because the feature(s) no longer exists or were not found. An attempt by SCS field staff to locate and examine these three features was completed when assessments for these general locations were made.

In Field Identified Feature	Desktop Identified Feature	Exhibits all three Corps Features	Possible Significant Nexus with WOTUS	Delineated Length / Acres of Feature
W-1	NWI 9	Yes	--	0.31 Ac
W-2	**--**	**Yes**	**Yes**	**0.08 Ac**
W-3	Photo	Yes	--	0.18 Ac
W-4	--	Yes	--	0.034 Ac
W-5	--	Yes	--	0.039 Ac
W-6	--	Yes	--	0.018 Ac
In field Identified Feature	**Desktop Identified Feature**	**Exhibits all three Corps Features**	**Possible Significant Nexus with WOUS**	**Delineated Length / Acres of Feature**
W-7	Topo 1	Yes	--	0.148 Ac
W-8	Photo	Yes	--	0.019 Ac
W-9	NWI 7	Yes	--	0.29 Ac
W-10	NWI 6	Yes	--	0.19 Ac
W-11	NWI 2	Yes	--	0.24 Ac
W-12	**NWI 4**	**Yes**	**Yes**	**2.93 Ac**
W-13	NWI 1	Yes	--	0.14 Ac
W-14	**NWI 3**	**Yes**	**Yes**	**1.11 Ac**
S-1	**NWI 12**	**Yes**	**Yes**	**4,494 Ft**
S-2	**NWI 8**	**Yes**	**Yes**	**147 Ft**
S-3	**NWI 13**	**Yes**	**Yes**	**1,285 Ft**
D-1	NWI 8	No	--	1.514 Ft
D-2	NWI 8	No	Yes	3.15 Ac
D-3	NWI 8, 11	No	Yes	380 Ft
D-4	NWI 12	No	Yes	3,243 Ft
D-5	NWI 5	No	Yes	--
--	NHD 1	--	--	--
--	NWI 10	--	--	--
--	NWI 11	--	--	--

Table 1. Assessed hydric features identified from desktop and/or field verification.

1.4 SUMMARY OF FINDINGS

Twenty-five potential hydric features were identified from a review of available public databases and a completed site assessment of the subject site. Of these twenty-five features, field staff assessed twenty-two. Each of these twenty-two features were assessed as to the probability of being jurisdictional based on the criteria of exhibiting the three hydric criteria and having a potential significant nexus with WOTUS.

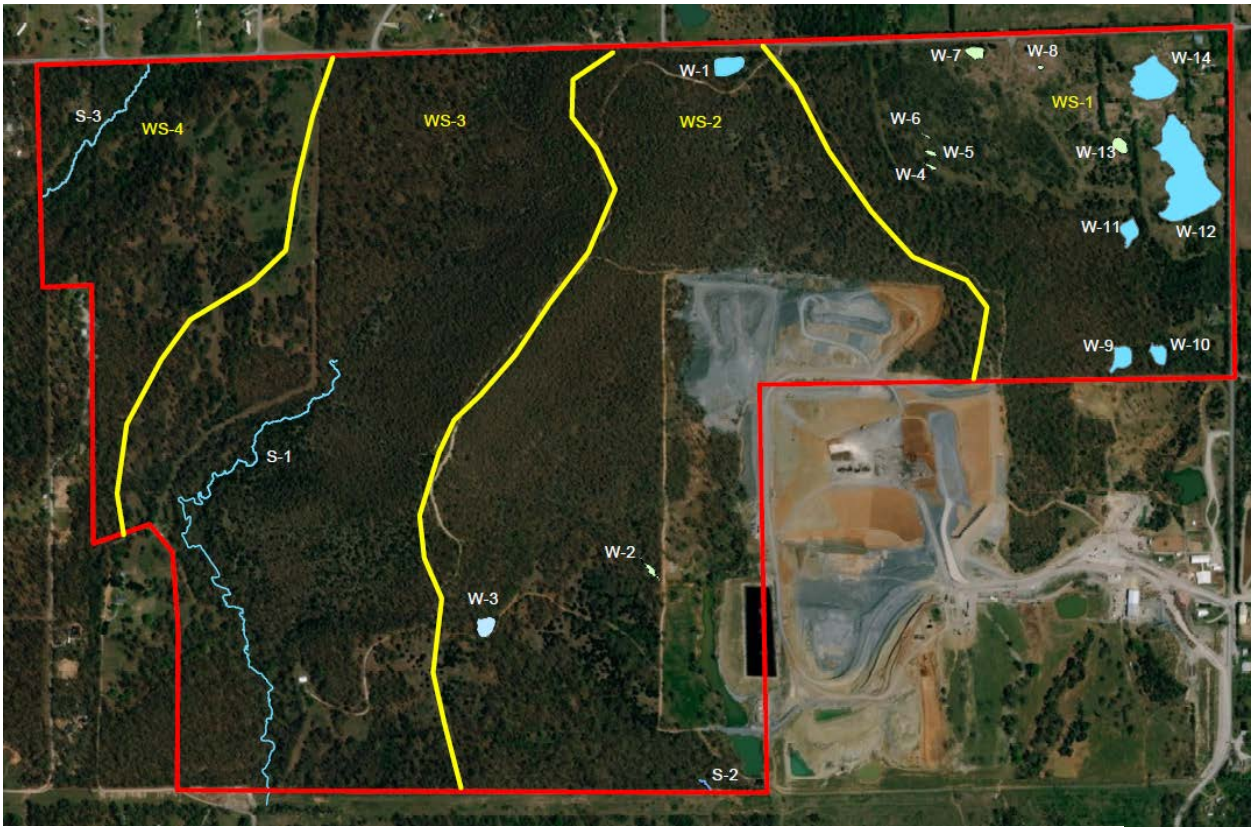


Figure 8. Subject Site's wetland features that exhibit all three hydric characteristics.

Of the twenty-five identified features:

- It is SCS's opinion that six wetland features appear to have a significant nexus with WOTUS and therefore would have jurisdictional oversite from the USACE
    - Wetlands/ponds – W-2, W-12, W-14,
    - Streams – S-1, S-2, and S-3
- Eleven features exhibited all three of the discussed hydric characteristics but a significant nexus could not be established.
- Five NWI mapped features were designated as non-qualified wetlands because they did not exhibit one or more of the required hydric characteristics used by the USACE to identify potential jurisdictional wetland.
- Three desktop identified features were not assessed during the site visit because they no longer exist or were not able to be located.

SCS recognizes that the USACE has the official authority to make rulings on jurisdictional determinations. The findings in this report are based on SCS's understanding of current rules that are used by the USACE to determine their jurisdictional responsibility. This report is being provided to assist the USACE in their determinations for the discussed features within this report.

2 PROJECT OVERVIEW

SCS completed a wetlands determination and delineation for a proposed lateral expansion of the active landfill northwest of Sand Springs, Oklahoma. The proposed lateral expansion would include the permitting of land, adjacent to the north and west of the current AEL landfill permit boundary for development. The State of Oklahoma solid waste permitting process requires that consultation with the USACE be completed prior to state approval. Wetland determinations and delineations were completed to determine if impacts to WOTUS may occur within the Subject Site and could possibly incur impacts as a result of the proposed lateral expansion. The project area is approximately 463 acres and located adjacent to the western and northern boundaries of the existing permitted boundary located approximately 3.25 miles northwest of Sand Springs in Osage County, Oklahoma **(Appendix A, Figure 1)**.

3 SCOPE

This preliminary wetland determination report will include the following components:

- Background document review of published data that helps identify existing and historic hydric features
- Field reconnaissance to identify location and size of wetlands within the Subject Site
- Generation of maps illustrating the size and location of field identified wetlands
- Preparation of this report summary for submittal

The term "wetland" in this report is consistent with the NWI database use, which includes all forms of hydric features as wetlands. For the purpose of this report, wetland(s) are defined as any hydric feature that maybe identified as WOTUS and could be subject to USACE jurisdictional authority. These hydric feature can include, but not limited to:

- River, Streams, and Creeks
- Swamps, Bogs, Playas, Fens, Marshes
- Ponds, Lakes, Reservoirs

Field identified wetland features are identified as potential wetlands to denote that they may not be under USACE jurisdictional control. Upon request, the USACE will provide jurisdictional determinations on identified hydric features.

This report will utilize published and field collected data to determine if potential wetlands satisfy the necessary jurisdictional criteria identified by the USACE. This report is a preliminary determination and can be submitted, along with a JD request, to the USACE. Recommendations in this report on potential JD designations are SCS's opinion based on available data.

3.1 PUBLISHED DATA REVIEW

A review of publically available information for the Subject Site was performed in order to evaluate the overall water resource characteristics of the Subject Site. This review included:

- Aerial imagery,
- NWI maps,
- United States Geological Survey (USGS) topographic maps,
- National Hydrography Dataset (NHD),
- Federal Emergency Management Agency (FEMA) Federal Insurance Rate Map (FIRM), and
- the United States Department of Agriculture Natural Resource Conservation Service (NRCS) County Soil Survey maps

A field investigation was conducted to determine if published and unpublished wetlands or watercourses are located within the Subject Site and to delineate WOTUS boundaries, as required for potential jurisdictional determination under Section 404 of the CWA.

3.2 FIELD PROCEDURES

SCS followed wetland preliminary determination method guidelines outlined in the USACE Wetlands Delineation Manual and the Regional Supplement to the USACE Wetland Delineation Manual: Midwest Region (Version 2.0) (USACE, 1987) (USACE, 2010). A wetland determination is typically based on a three-parameter approach that requires evidence of the following wetland indicators:

1. Dominant Hydrophilic Vegetation
2. Hydric Soil Characteristics
3. Presence of Wetland Hydrology

A potential wetland must meet all three wetland indicator criteria (except where noted in the USACE 1987 and 2010 manuals) to be considered a jurisdictional wetland. Hydric plant and soils for each potential wetland area are used to delineate the wetland boundary. A significant nexus may not be determined in the field. The use of desktop and field collected data will be used to assess a potential significant nexus for each field identified potential wetland feature that exhibits the three previously described wetland characteristics.

4 PROJECT LOCATION AND SITE DESCRIPTION

The project area includes approximately 463 acres on the west and north sides of the existing permit boundary (Subject Site) **(Appendix A, Figure 1)**. From the intersection of Anderson Road and N 177th West Avenue in Osage County, OK, the Subject Site extends west approximately 1.3 miles and south approximately 0.83 miles.

AEL is located 3.25 miles northwest of Sand Springs, Oklahoma. The Subject Site is located in the East 4/5 of Section 35 and the NW 1/4 of Section 36, T20N, R10E near Latitude 36.166643, Longitude -96.203007. The vegetative cover consisted predominantly of mature oak/hickory woodlands located on steep sloping hills and grassland/pastures located on flat areas in the northeast and northwest corners of the Subject Site.

Figure 1. Subject Site Area.

The Subject Site is located within portions of four watersheds **(Appendix A, Figure 2)**. These watersheds are identified from east to west as:

- Watershed 1 (WS-1) is located along the west side of North 177th West Avenue
- Watershed 2 (WS-2) is located adjacent to the west side of WS-1
- Watershed-3 (WS-3) is located adjacent to the west side of WS-2
- Watershed 4 (WS-4) is located adjacent to the west side of WS-3

4.1 WATERSHED LOCATION DESCRIPTION

Figure 2. Subject Site with the identified watersheds.

WS-1 is located in the north east corner of the Subject Site and sheds water toward the southeast (Appendix A, Figure 2). Land cover is a combination of woodland, grassland, and several homesteads. Three homesteads are located along the west side of North 177th West Avenue. The terrane in this watershed is a combination of steep hillsides and flat grasslands. The steep hillsides are dominated by mature woodlands and rock outcroppings. Several drainages channels were observed along the steep slopes. The grasslands are flat and appear to have been used for grazing livestock as there were several fence rows and a small coral. The soils in the grasslands were dominated by silty loam over clay/clay loam.

WS-2 is located along the west edge of WS-1 and encompasses the length of the Subject Site from the northern to the southern boundaries (Appendix A, Figure 2). This watershed is dominated by steep sloping hills with mature woodlands. A steep drainage channel, which starts near the northern boundary, traverses the Subject Site from the north to the south. The southeastern half of this watershed is the current AEL operation. The western slope of this watershed has remained mostly undisturbed with the woodland cover and large rock outcropping.

WS-3 is located along the western side of WS-2 and encompasses the length of the Subject Site from the northern to the southern boundaries (Appendix A, Figure 2). This watershed is similar to WS-2 with steep slopes dominated by mature woodlands. The drainage channel traverses from the north to the south across the Subject Site. The western slope of WS-3 has a section of grassland along the northwest corner of this watershed in the Subject Site. Much of this watershed is undisturbed except for an abandoned homestead near the southern Subject Site border

WS-4 is located along the northwest corner of the Subject Site along the west side of WS-3 (Appendix A, Figure 2). This watershed is a combination of prairie and mature woodlands. A diverse plant community of prairie plants, shrubs, and trees is present throughout this watershed. A stream channel traverses this watershed from the northeast to the southwest entering the Subject Site along the northern border and exits the site along the western border. The soil throughout this watershed is dominated by a sandy/sandy-loam soil. This watershed's terrain exhibits a more gradual slope than the other three watershed's hilly slopes

4.2 ECOREGION DESCRIPTION

The Subject Site is located within the Northern Cross Timbers (Level 4 Ecoregion) of the Cross Timbers (Level 3 Ecoregion) of Oklahoma (Woods, 2005). This region is characterized by a mosaic of oak savanna, scrubby oak forest, and tall grass prairie naturally covering the hills, cuestas, and ridges. Tall grass prairie naturally occurs on fine-textured soils derived from limestone or shale. Soils are highly erodible when disturbed. There are two common stream types. A mixture of shaded riffles, runs, and pools that have gravel or cobble substrates characterizes the first. The second stream type has lower gradients and is found typically downstream of the first, it is characterized by wide, shallow, sand-chocked channels. Uplands are mantled by Quaternary clayey silt-to-silt clay decomposition residuum, and sandy decomposition residuum. Valleys are veneered with Quaternary alluvium. The area is underlain by Pennsylvanian and Permina-age sandstone, shale, and limestone. Where rock outcrops occur sandstone blocks and boulders often litter hilltops and slopes. Soils consist of sandy and clayey residuum and colluvium overlaying Pennsylvanian sandstone, limestone and shale. The common soil series in this region for uplands include Darnell, Stephenville, Niotaze, Steedman, Coweta, Dennis, Bates, Clarita, Durant, Shidler, Newalla, Harrah, Chigley, and Konawa. The common soil series for floodplains include Verdigris, Port, Pulaski, and Garvin. Native vegetation is a combination of oak-hickory woodland and tallgrass prairie. Woodland areas are dominated by post oak (*Quercus stellate*), and blackjack oak (*Q. marilandica*) while tall grass prairie is dominated by big bluestem (Andropogon gerardii), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*) and Indiangrass (*Sorghastrum nutans*). Current land cover is woodland, grassland, rangeland, pastureland, and limited cropland. The main crops in this region are small grains, grain sorghum, hay and soybeans.

5 PUBLISHED DOCUMENTATION REVIEW

A desktop review was performed utilizing NWI Maps **(Appendix A, Figure 3)**, aerial photographs **(Appendix A, Figure 1)**, USGS Topographic Maps **(Appendix A, Figure 4)**, NHD **(Appendix A, Figure 5)**, FEMA National Flood Hazards Maps **(Appendix A, Figure 6)**, and NRCS County Soil Survey Maps **(Appendix A, Figure 7)**. These resources were reviewed for the Subject Site to evaluate the potential location and extent of wetlands, watercourses, and other aquatic features.

5.1 NATIONAL WETLANDS INVENTORY MAP REVIEW

SCS conducted a NWI review of the Subject Site for preliminary determination for the presence, location and size of potential wetlands located entirely or partially within the Subject Site. The U.S. Fish and Wildlife Service (USFWS) generates NWI Maps through aerial imagery review, which may not accurately depict the extent or location of wetlands in an area **(Appendix A, Figure 3)**. According to the NWI data, thirteen mapped wetland features are located within the boundary of the Subject Site (USFWS, 2016). These wetlands are identified as:

Figure 3. NWI mapped features within the Subject Site.

5.1.1 WS-1 NWI FEATURES

1. **NWI-1**: A 0.19 Acre PUSCx (Palustrine, Unconsolidated Shore, Seasonally Flooded, Excavated) freshwater pond located near the north-center of the WS-1 Subject Site area.
2. **NWI-2**: A 0.20 Acre PUSCx freshwater pond located near the south-center of the WS-1 Subject Site area.
3. **NWI-3**: A 1.34 Acre PUBFh (Palustrine, Unconsolidated Bottom, Semipermanently Flooded, Diked/Impounded) freshwater pond located near the northeast corner of the WS-1 Subject Site area.

4. NWI-4: A 1.77 Acre PUBHh (Palustrine, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded) freshwater pond located near the eastern Subject Site boundary, south of the 1.34 Acre PUBFh freshwater pond.
5. NWI-5: The northwest end of a 2.44 Acre R5UBF (Riverine, Unknown Perennial, Unconsolidated Bottom, Semipermanently Flooded) riverine habitat that begins at the southwest side of the previously discussed 1.77 Acre PUBHh freshwater pond. This riverine feature traverses off the Subject Site toward the southeast.
6. NWI-6: A 0.22 Acre PUBFh freshwater pond located adjacent to the southern Subject Site boundary.
7. NWI-7: A 0.20 Acre PUBFh freshwater pond located adjacent to the southern Subject Site boundary and west of the previously identified 0.22 Acre PUBFh freshwater pond.

5.1.2 WS-2 NWI FEATURES

1. NWI-8: A 8.16 Acre R5UBF riverine feature located along the western third of the Subject Site running generally from the north to the south of the Subject Site.
2. NWI-9: A 0.25 Acre PUSCh (Palustrine, Unconsolidated Shore, Seasonally Flooded, Dike/Impounded) freshwater pond located near the north border of the Subject Site.
3. MW-10: A 0.22 Acre PUBFh freshwater pond is located near the center of WS-2 along the east slope.
4. NWI-11: A 0.11 Acre PUSCh freshwater pond located near the southeast corner of the subject site.

5.1.3 WS-3 NWI FEATURES

1. NWI-12: A 6.33 Acre R5UBF riverine feature located along the eastern third of the Subject Site running generally from the north to the south of the Subject Site.

5.1.4 WS-4 NWI FEATURES

1. NWI-13: A mid portion of a 6.21 Acre R5UBF riverine feature along the northwest corner of the WS-4 Subject Site Area.

5.1.5 NWI FEATURES NEAR THE SUBJECT SITE

Ten NWI wetlands are mapped within 0.25 mile of the Subject Site. The NWI-mapped wetland designations on surrounding properties include:

1. A 0.21 Acre PUBFh freshwater pond is located approximately 0.11 miles north of the WS-1 Subject Site.
2. A 0.28 Acre PUBFh freshwater pond is located approximately 0.14 miles north of the WS-1 Subject Site.
3. A 0.65 Acre R5UBF riverine habitat located approximately 0.22 miles north of the WS-1 Subject Site.
4. A 0.30 Acre PUBFx freshwater pond located approximately 0.13 miles southeast of WS-1 Subject Site.
5. A 0.75 Acre PUBFh freshwater pond located approximately 0.10 miles south of WS-1 and 0.44 miles east of WS-2.

6. A 0.22 Acre PUBFh (Palustrine, Unconsolidated bottom, Semipermanently flooded, Dike/Impounded) freshwater Pond adjacent to the center of the WS-2 eastern Subject Site boundary.
7. A 0.74 Acre PUBFh freshwater pond is located approximately 0.18 miles north of the WS-2 Subject Site.
8. A 0.32 Acre PUSCh freshwater pond located approximately 0.09 miles east of the south corner of the WS-2 Subject Site.
9. A 0.25 Acre PUBFh freshwater pond is located approximately 0.19 miles south of the WS-3 Subject Site.
10. A 6.98 Acre PF01A (Palustrine, Forested, Broad-Leaved deciduous, Temporary flooded) freshwater forested/shrub wetland is located approximately 0.12 miles west of the west edge of the WS-4 Subject Site.

All of the NWI freshwater ponds appear to be excavated/impounded freshwater ponds.

5.2 AERIAL PHOTOGRAPH REVIEW

Aerial photographs dated 2018-2015, 2013-2010, 2008, 2006-2003, and 1995 were reviewed using Google Earth Pro Inc. (Google Earth 2018). Aerial photographs were reviewed to identify potential wetlands or other hydrological features located within or in close proximity to the Subject Site. A review of historic aerial photographs helps to identify potential hydric features that may not be observed from year to year or in current aerial photographs. Visible landscape features around the Subject Site include pasture/grassland and woodland areas with multiple ponds of varying sizes. The Subject Site was dominated by woodlands and grasslands **(Appendix A, Figure 1)**. A total of 14 observable ponds/potential wetlands and three drainage/stream channels were observed within the Subject Site in aerial photographs.

5.2.1 WS-1 AERIAL REVIEW

A review of aerial photographs for WS-1 revealed a total of eight potential wetland features within this watershed. From 1995 through 2008, this watershed contained seven potential water features including **W-7**, **W-9** through **W-14.** After 2009, an additional small water feature (**W-8**) was observed east of a pump-jack installed sometime between June 2005 and April 2006. A drainage channel could be seen, when leaf cover was minimal, along the southern third of this watershed traversing from the west to the east and ending near a small pond (**W-13**).

5.2.2 WS-2 AERIAL REVIEW

A review of aerial photographs for WS-2 identified seven possible wetland features including a drainage/stream channel within the WS-2 watershed located in the Subject Site. Starting in 1995, three ponds were observed near the center drainage line of the watershed and included:

- **NWI-8** (**D-1, D-2**)
- **W-1** (**NWI-9**)
- **NWI-10**
- **NWI-11**

These ponds all appear to have a constructed dike structure/access road that has restricted or dammed water draining from the surrounding watershed. Starting in 2003, a fourth pond could be seen on the west slope of WS-2 (**W-3)**. This new pond appears along the west side of a recently constructed two-track road. After March 2015 two more hydric features (one pond (**D-1**), one potential wetland (**W-2**)) could be observed within WS-2. Five of the six ponds could be observed in 2018 aerial imagery.

- **NWI-9 (W-1)**
- **NWI-11**
- **W-2**
- **W-3**
- **NWI-8 (D-1's southern third)**

Both of these recent hydric features (**W-2 and D-1's southern end**) appear to be associated with AEL operational activities. Both of these recent features are located in historic drainage channels. One pond, that was initially observed in 1995 (**NWI-10**), is no longer found in aerial photographs after June 2011. This pond was along the eastern border of the Subject Site and was located predominantly within the previously permitted landfill boundary.

5.2.3 WS-3 AERIAL REVIEW

A review of aerial photographs for WS-3 revealed a single drainage/stream channel that traversed from the north to the south with a western meander (**NWI-12**). No other potential water features were observed throughout the years. A small homestead building was observed in all the aerial photographs located in the southwest ¼ of the WS-3 Subject Site. An access road was observed to run from the homestead up to the northeast joining Anderson Road along the norther border of the Subject Site. This road appears to be the dividing line between WS-2 and WS-3.

5.2.4 WS-4 AERIAL REVIEW

Like WS-3 a review of aerial photographs for WS-4 revealed a single drainage/stream channel (**NWI-13**). This channel traversed from the northeast to the southwest along the northwest corner of the Subject Site. No other hydric features were observed throughout this watershed within the Subject Site.

5.3 USGS TOPOGRAPHIC MAP REVIEW

The USGS 7.5 Minute Topographic Quadrangle (Wekiwa, Okls. Quadrangle, 1958) indicates that the Subject Site's elevation ranged from approximately 930 feet above mean sea level (amsl) near the

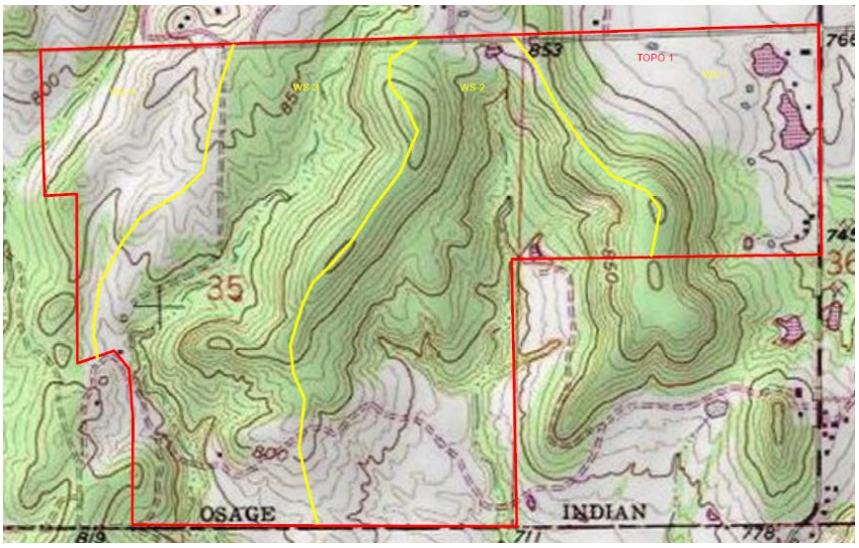


Figure 4. Topographic Map includes the "Topo 1" feature in the top right corner.

north central area to approximately 730 feet amsl near the southeast corner. Features mapped on the topographic map are discussed for each watershed within the subject site.

5.3.1 WS-1 USGS REVIEW

Topographic depicted hydric features for WS-1 include seven ponds and one intermittent stream. Six of these ponds have previously been identified as NWI mapped features and include W-9 through W-14. A pond (Topo 1(W-7)) is located on the topographic map near the north border of WS-1 is an additional mapped pond that was not identified by the NWI database **(Appendix A, Figure 4)**. The intermittent stream is in the same general location as the NWI-5 features.

5.3.2 WS-2 USGS REVIEW

Topographic depicted hydric features for WS-2 include three ponds and one intermittent stream. All hydric features within the WS-2 Subject Site area were previously identified in NWI database and include W-1, S-2, D-1 and D-2 (NWI-8 through NWI-11) **(Appendix A, Figure 4)**.

5.3.3 WS-3 USGS REVIEW

Topographic depicted hydric features for WS-3 include one intermittent stream. This intermittent stream was identified as the NWI-12 (S-1 and D-1) feature **(Appendix A, Figure 4)**.

5.3.4 WS-4 USGS REVIEW

Topographic depicted hydric features for WS-4 include one intermittent stream. This intermittent stream identified as NWI-13 (S-3) feature **(Appendix A, Figure 4)**.

5.3.5 ADDITIONAL USGS HYDRIC FEATURES

Twelve water features that include ten freshwater ponds and two intermittent streams are mapped within approximately 0.2 mile of the Subject Site **(Appendix A, Figure 4)**. The topographic surface within the Subject Site is represented as areas of steep hills with vegetative cover transitioning to gradual sloping terrain.

5.4 NATIONAL HYDROGRAPHY DATASET

A review of the NHD identified eleven ponds and four intermittent streams within the Subject Site (USGS 2017) **(Appendix A, Figure 5)**. Nine of these ponds correspond with the previously discussed NWI features identified within the Subject Site. The inserted clip from **Figure 5** shows the general location of the NHD features.

Figure 5. NHD mapped features including the identified NHD 1 feature.

5.4.1 WS-1 NHD REVIEW

Two additional ponds were identified in the WS-1 Subject Site area that were not identified in the NWI database. W-7 was a pond identified in the topographic map and is located near the north border of WS-1. The remaining pond (NHD 1) was not identified by either the NWI or topographic map and is located west of W-14, a freshwater pond. The intermittent stream channel NWI-5 drains and confluences with Shell Creek east of the Subject Site.

5.4.2 WS-2 NHD REVIEW

Three ponds and one stream channel are identified within WS-2 by the NHD. These three ponds are in similar locations W-1, NWI-10, and D-2 (NWI-11 and S-1). The intermittent stream is in the same general area as NWI-8 (D-1 and D-2). No new hydric features were identified from the NHD. This intermittent stream channel confluences with the Arkansas River approximately one mile south of the Subject Site.

5.4.2 WS-3 REVIEW

A single stream channel is identified within WS-3 that correspond with previously identified NWI-12 (S-1 and D-1). This stream channel confluences with the Arkansas River approximately one mile south of the subject site.

5.4.3 WS4 REVIEW

A single stream channel is identified within WS-4. This stream channel has previously been identified as NWI -13 (S-3). The Intermittent stream drains to the southwest and confluences with Sand Creek west of the Subject Site.

5.5 FEMA FLOODPLAIN REVIEW

A review of FEMA FIRM floodplain maps (FEMA n.d.) was conducted to identify if the Subject Site is located within a flood hazard zone and what, if any, designation(s) that may include part or all of the Subject Site. The Subject Site is located within the Osage County 40013C FIRM map. This FEMA Floodplain map shows that all of the Subject Site is located within a Zone X area of minimal Flood Hazard **(Appendix A, Figure 6)**. Zone X is identified as areas that are outside the 1 percent (100 year) and 0.2 percent (500 year) annual chance floodplains. The Subject Site has a minimal chance of being impacted from flooding events.

5.6 SOIL SURVEY REVIEW

The NRCS Web Soil Survey (USDA-NRCS 2017) lists ten soil types within the Subject Site. These soils include:

5.6.1 WS-1 SOIL REVIEW

WS-1 soils include:

1. 17 – Agra-Pharaoh complex, 1 to 5 percent slopes
2. 18 – Agra-Ashport, frequently flooded, complex, 0 to 12 percent slopes
3. 38 – Norge silt loam, 1 to 3 percent slopes
4. 39 – Norge silt loam, 3 to 5 percent slopes
5. 40 – Norge silt loam, 5 to 8 percent slopes
6. 49 – Parsons-Pharaoh complex, 0 to 3 percent slopes
7. 57 – Steedman-Lucien complex, 3 to 15 percent slopes
8. 65 – Vanoss silt loam, 1 to 3 percent slopes
9. NBRE - Niotaze-Bighear-Rock outcrop complex, 1 to 8 percent slopes
10. NBRF – Niotaze-Bighear-Rock outcrop complex, 15 to 25 percent slopes, extremely stony

The approximate location of each soil type is presented in **Appendix A, Figure 7**.

5.6.2 WS-2 SOIL REVIEW

WS-2 soils include:

11. 18 – Agra-Ashport, frequently flooded, complex, 0 to 12 percent slopes
12. 20 – Dougherty loamy fine sand, 3 to 8 percent slopes
13. 39 – Norge silt loam, 3 to 5 percent slopes
14. 42 – Norge, Agra, and Prue soils, 3 to 8 percent slopes, gullied

15. BNRD – Bigheart-Niotaze_Rock outcrop complex, 1 to 8 percent slopes
16. NBRF – Niotaze-Bigheart-Rock outcrop complex, 15 to 25 percent slopes

The approximate location of each soil type is presented in **Appendix A, Figure 7**.

5.6.3 WS SOIL REVIEW

WS-3 soils include:

17. 20 - Dougherty loamy fine sand, 3 to 8 percent slopes
18. 21 - Eufaula loamy fine sand, 3 to 15 percent slopes
19. 67 – Verdigris silt loam, 0 to 1 percent slopes, frequently flooded
20. BNRD – Bighear-Niotaze-Rock outcrop complex, 1 to 8 percent slopes
21. NBRF – Niotaze-Bigheart-Rock outcrop complex, 15 to 25 percent slopes, very stony

Of these soils, Verdigris silt loam, 0 to 1 percent slopes, frequently flooded is considered hydric by the NRCS (USDA-NRCS 2018). The approximate location of each soil type is presented in **Appendix A, Figure 7**.

5.6.4 WS SOIL REVIEW

WS-4 soils include:

22. 20 – Dougherty loamy fine sand, 3 to 8 percent slopes
23. 21 – Eufaula loamy fine sand, 3 to 15 percent slopes
24. 67 – Verdigris silt loam 0 to 1 percent slopes, frequently flooded

Of these soils, Verdigris silt loam, 0 to 1 percent slopes, frequently flooded is considered hydric by the NRCS (USDA-NRCS 2018). The approximate location of each soil type is presented in **Appendix A, Figure 7**.

6 WATERS AND WETLANDS FIELD ASSESSMENT

SCS conducted a preliminary wetland determination on May 24-25 and August 1-2, 2018 to determine if potential jurisdictional wetlands may be located within the Subject Site. Portions of four watersheds are located within the Subject Site (WS-1 through WS-4). Seventeen potential wetlands were identified within the Subject Site during the site visits (Table 1). These identified hydric features will be discussed in more detail below. Potential wetlands will be discussed as to the watershed they are located in.

In field Identified Feature	Desktop Identified Feature	Latitude	Longitude	Identified near an NWI feature	Identified on aerial Photographs	Identified on a topographic map	Identified on the NHD	Exhibits all three Corps Features	Possible Significant Nexus with WOUS	Delineated Length / Acres of Feature
W-1	NWI 9	36.172764	96.198287	Pond	Yes	Yes	Yes	Yes	--	0.31 Ac
W-2	--	36.164736	96.200233	--	--	--	--	Yes	Yes	0.08 Ac
W-3	--	36.164009	96.230394	--	Yes	--	--	Yes	--	0.18 Ac
W-4	--	36.171237	96.19462	--	--	--	--	Yes	--	0.034 Ac
W-5	--	36.17135	96.194651	--	--	--	--	Yes	--	0.039 Ac
W-6	--	36.171497	96.194658	--	--	--	--	Yes	--	0.018 Ac
W-7	Topo 1	36.172836	96.193619	--	Yes	Yes	Yes	Yes	--	0.148 Ac
W-8	--	36.172682	96.192494	--	Yes	--	--	Yes	--	0.019 Ac
W-9	NWI 7	36.167974	96.190973	Pond	Yes	Yes	Yes	Yes	--	0.29 Ac
W-10	NWI 6	36.167888	96.190309	Pond	Yes	Yes	Yes	Yes	--	0.19 Ac
W-11	NWI 2	36.170126	96.190927	Pond	Yes	Yes	Yes	Yes	--	0.24 Ac
W-12	NWI 4	36.170699	96.190131	Pond	Yes	Yes	Yes	Yes	Yes	2.93 Ac
W-13	NWI 1	36.17117	96.190877	Pond	Yes	Yes	Yes	Yes	--	0.14 Ac
In field Identified Feature	**Desktop Identified Feature**	**Latitude**	**Longitude**	**Identified near an NWI feature**	**Identified on aerial Photographs**	**Identified on a topographic map**	**Identified on the NHD**	**Exhibits all three Corps Features**	**Possible Significant Nexus with WOUS**	**Delineated Length / Acres of Feature**
W-14	NWI 3	36.172346	96.190646	Pond	Yes	Yes	Yes	Yes	Yes	1.11 Ac
S-1	NWI 12	36.16675	96.207981	Riverine	Yes	Yes	Yes	Yes	Yes	4,494 Ft
S-2	NWI 8	36.161365	96.199248	Riverine	--	Yes	Yes	Yes	Yes	147 Ft
S-3	NWI 13	36.1719896	96.2108786	Riverine	--	Yes	Yes	Yes	Yes	1,285 Ft
D-1	NWI 8	36.171467	96.198346	Riverine	--	Yes	Yes	No	--	1.514 Ft
D-2	NWI 8	36.16469	96.199254	Riverine	Yes	Yes	Yes	No	Yes	3.15 Ac
D-3	NWI 8, 11	36.161962	96199429	Riverine, Pond	Yes	Yes	Yes	No	Yes	380 Ft

In field Identified Feature	Desktop Identified Feature	Latitude	Longitude	Identified near an NWI feature	Identified on aerial Photographs	Identified on a topographic map	Identified on the NHD	Exhibits all three Corps Features	Possible Significant Nexus with WOUS	Delineated Length / Acres of Feature
D-4	NWI 12	36.170459	96.203946	Riverine	Yes	Yes	Yes	No	Yes	3,243 Ft
D-5	NWI 5	--	--	Riverine	--	Yes	Yes	No	Yes	--
--	NHD 1	--	--	--	Yes	--	Yes	--	--	--
--	NWI 10	--	--	Pond	Yes	Yes	Yes	--	--	--
--	NWI 11	--	--	Pond	Yes	Yes	Yes	--	--	--

Table 1. Potential WOTUS features. Figures 2-6 and 8-9 have data represented in this table.

6.1 WS-1 POTENTIAL HYDRIC FEATURES

Eleven potential wetland features were located in WS -1 and include W-4 through W-14 **(Figure 8, 8-1)**. Six of these features would be described as freshwater ponds and five as emergent wetlands. The inserted clip of **Figure 8-1** indicates the location and size of each potential wetland in WS-1. The following WS-1 potential wetlands include:

6.1.1 POTENTIAL WETLAND W-4

Potential wetland **W-4** is located in the western third of the Subject Site's WS-1 along the base of the steep slope. The area appears to have been an old terrace or a possible "two-track" access road. The area around W-4 is relatively flat. Runoff from the surrounding land appears to drain into a depression (W-4) that allows for pooling. W-4 is completely within the WS-1 Subject Site boundary. No water was observed within W-4 during the site visit. The determination location was at latitude 36.171237, longitude -96.194620 **(Appendix A, Figure 8-1)**. Inland sedge (*Juncus interior*), pinkweed (*Persicaria pensylvanica*), and beaked cut-throat grass (*Coleataenia anceps*) dominated the herbaceous stratum. The size of this potential wetland is approximately 0.034 acres. The hydric soils were consistent with redox depression Matrix (F8). Hydrological features consisted of sparsely vegetated concave surface. No public available data source identified a potential wetland in the vicinity of W-4 **(Table 1)**. A photograph of W-4 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-4 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-4 does not appear to have a significant nexus with an identifiable WOTUS feature.

6.1.2 POTENTIAL WETLAND W-5

Figure 8-1. WS-1 field determined wetland features.

Potential wetland W-5 is located in the western third of the Subject Site's WS-1 along the base of the steep slope northeast of W-4. The area appears to have been an old terrace or a possible "two-track" access road. The area around W-5 was relatively flat. Runoff from the surrounding land appears to drain into a depression (W-5) that allows for pooling. W-5 is completely within the WS-1 Subject Site boundary. No water was observed within W-5 during the site visit. The determination location was at latitude 36.171350, longitude -96.194651 **(Appendix A, Figure 8-1)**. Woolly sedge (*Carex pellita*), inland sedge, and beaked cut-throat grass dominated the herbaceous stratum. The size of this potential wetland is approximately 0.039 acres. The hydric soils were consistent with redox depression Matrix (F8). Hydrological features consisted of sparsely vegetated concave surface. No public available data source identified a potential wetland in the vicinity of W-5 **(Table 1)**. A photograph of W-5 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-5 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-5 does not appear to have a significant nexus with an identifiable WOTUS feature.

6.1.3 POTENTIAL WETLAND W-6

Potential wetland W-6 is located in the western third of the Subject Site's WS-1 along the base of the steep slope northeast of W-5. The area appears to have been an old terrace or a possible "two-track" access road. The area around W-6 was relatively flat. Runoff from the surrounding land appears to drain into a depression (W-6) that allows for pooling. W-6 is completely within the WS-1 Subject Site boundary. No water was observed within W-6 during the site visit. The determination location was at latitude 36.171497, longitude -96.194658 **(Appendix A, Figure 8-1)**. Inland sedge, Woolly sedge, and beaked cut-throat grass dominated the herbaceous stratum. The size of this potential wetland is approximately 0.018 acres. The hydric soils were consistent with redox depression Matrix (F8). Hydrological features consisted of sparsely vegetated concave surface. No public available data source identified a potential wetland in the vicinity of W-6 **(Table 1)**. A photograph of W-6 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-6 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-6 does not appear to have a significant nexus with an identifiable WOTUS feature.

6.1.4 POTENTIAL WETLAND W-7

Potential wetland W-7 is located in the western third of the Subject Site's WS-1 along the northern Subject Site boundary, south of Anderson Road. W-7 appears to be an old farm pond with a constructed berm along the north and east sides. Water from the surrounding area and the ditch along the south side of Anderson Road appear to drain into W-7. W-7 is completely within the WS-1 Subject Site boundary. Surface water was present near the middle of W-7 during the site visit. The determination location was at latitude 36.172836, longitude -96.193619 **(Appendix A, Figure 8-1)**. American Elm (*Ulmus Americana)* dominated the tree stratum while soft-stem bulrush (*Schoenoplectus tabernaemontani*), pinkweed, and woolly sedge dominated the herbaceous stratum. The size of this potential wetland is approximately 0.148 acres. The hydric soils were consistent with redox dark surface matrix (F6). Hydrological features consisted of surface water, saturation, and true aquatic plants. This feature was identified by aerial imagery, NHD, and topographic maps **(Table 1)**. A photograph of W-7 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-7 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-7 does not appear to have a significant nexus with an identifiable WOTUS feature.

6.1.5 POTENTIAL WETLAND W-8

Potential wetland W-8 is located in the central third of the Subject Site's WS-1 near the northern boundary. W-8 appears to be an old borrow pit area that provided material for a pump-jack pad. This pad area is adjacent to W-8's western boundary. Water from the surrounding area appears to drain and pool in this constructed depression. W-8 is completely within the WS-1 Subject Site boundary. No surface water was present during the site visit. The determination location was at latitude 36.172682, longitude -96.192494 **(Appendix A, Figure 8-1)**. Flat-stem spike-rush (*Eleocharis compressa*) soft-stem bulrush and yellow-fruit sedge (*Carex annectens*) dominated the herbaceous stratum. The size of this potential wetland is approximately 0.019 acres. The hydric soils were consistent with redox depressions matrix (F8). Hydrological features consisted of, sparsely vegetated concave surface and oxidized rhizospheres. No public available data source identified a potential wetland in the vicinity of W-8 **(Table 1)**. A photograph of W-8 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-8 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-8 does not appear to have a significant nexus with an identifiable WOTUS feature.

6.1.6 POTENTIAL WETLAND W-9

Potential wetland W-9 is located in the central third of the Subject Site's WS-1 near the southern boundary. W-9 appears to be a constructed pond with a berm along the east side. Runoff from the hill west of W-9 appears to be directed into this constructed pond by means of ditches along an access road. Recent dirt work on the berm has removed most of the vegetation along the berm area. W-9 is completely within the WS-1 Subject Site boundary. Surface water was present during the site visit. The determination location was at latitude 36.167974, longitude -96.190973 **(Appendix A, Figure 8-1)**. American sycamore (*Platanus occidentalis*) dominated the tree stratum while coon's tail

(*Ceratophyllum demersum*) dominated the herbaceous stratum. Hydric vegetation along the shoreline was restricted to approximately three feet from the water's edge and sparse due to recent work on the berm. The size of this potential wetland is approximately 0.29 acres. The hydric soils were consistent with redox dark surface matrix (F6). Hydrological features consisted of, surface water, aquatic fauna and true aquatic plants. All public available data sources identified W-9 as a potential wetland including a NWI designation of PUBFh (NWI 7) **(Table 1)**. A photograph of W-9 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-9 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-9 does not appear to have a significant nexus with an identifiable WOTUS feature.

6.1.7 POTENTIAL WETLAND W-10

Potential wetland W-10 is located in the eastern third of the Subject Site's WS-1 near the southern boundary. W-10 appears to be a constructed pond with a berm along the east side. Runoff from W-9 appears to overflow into W-10. W-10 is completely within the WS-1 Subject Site boundary. Surface water was present during the site visit. The determination location was at latitude 36.167888, longitude -96.190309 **(Appendix A, Figure 8-1)**. Gray's sedge (*Carex grayi*) and coon's tail dominated the herbaceous stratum. Hydric shore line vegetation was restricted to approximately three feet from the water's edge. The size of this potential wetland is approximately 0.19 acres. The hydric soils were consistent with redox dark surface matrix (F6). Hydrological features consisted of, surface water, aquatic fauna and true aquatic plants. All public available data sources identified W-10 as a potential wetland a NWI designation of PUBFh (NWI 6) **(Table 1)**. A photograph of W-10 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-10 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-10 does not appear to have a significant nexus with an identifiable WOTUS feature.

6.1.8 POTENTIAL WETLAND W-11

Potential wetland W-11 is located in the eastern third of the Subject Site's WS-1 near the center. W-11 appears to be a constructed pond with a berm along the east side. A drainage channel, from the hillside west of W-11, intersects the southwest corner of W-11. No water was flowing into W-11 from this drainage. W-11 is completely within the WS-1 Subject Site boundary. Surface water was present during the site visit. The determination location was at latitude 36.170126, longitude -96.190927 **(Appendix A, Figure 8-1)**. flat-stem spike-rush, and blue water speedwell (*Veronica anagallis-aquatica*) dominated the herbaceous stratum. The size of this potential wetland is approximately 0.24 acres. The hydric soils were consistent with redox dark surface matrix (F6). Hydrological features consisted of, surface water, aquatic fauna and oxidized rhizospheres on living roots. All public available data sources identified W-11 as a potential wetland including a NWI designation of PUSCx (NWI 2) **(Table 1)**. A photograph of W-11 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-11 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-11 does not appear to have a significant nexus with an identifiable WOTUS feature.

6.1.9 POTENTIAL WETLAND W-12

Potential wetland W-12 is located in the eastern third of the Subject Site's WS-1 near the center and northeast of W-11. W-12 appears to be a pond with a constructed berm along the south end. No water was flowing into or out of W-12 during the site visit. W-12 is completely within the WS-1 Subject Site boundary. Surface water was present during the site visit. The determination location was at latitude 36.170699, longitude -96.190131 **(Appendix A, Figure 8-1)**. False indigo (*Amorpha fruticose*) dominated the shrub stratum while the flat-stem spike-rush and water primrose (*Ludwigia peploides*) dominated the herbaceous stratum. The size of this potential wetland is approximately 2.93 acres. The hydric soils were consistent with redox dark surface matrix (F6). Hydrological features consisted of, surface water, aquatic fauna and oxidized rhizospheres on living roots. All public available data sources identified W-12 as a potential wetland including a NWI designation of PUBHh (NWI 4) **(Table 1)**. A photograph of W-12 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-12 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-12 does appear to have a significant nexus with an identifiable WOTUS feature. The NWI 5 riverine feature would provide a connectivity of W-12 with Shell Creek, located approximately 0.51 miles east of the Subject Site.

6.1.10 POTENTIAL WETLAND W-13

Potential wetland W-13 is located in the eastern third of the Subject Site's WS-1 near the center and west of W-12. W-13 appears to be a constructed farm pond with a berm along the east side. No water was present in W-13 during the site visit. W-13 is completely within the WS-1 Subject Site boundary. The determination location was at latitude 36.171170, longitude -96.190877 **(Appendix A, Figure 8-1)**. Woolly sedge and pinkweed dominated the herbaceous stratum. The size of this potential wetland is approximately 0.14 acres. The hydric soils were consistent with redox depression matrix (F8). Hydrological features consisted of oxidized rhizospheres on living roots and inundation visible on aerial imagery. All public available data sources identified W-13 as a potential wetland including a NWI designation of PUSCx (NWI 1) **(Table 1)**. A photograph of W-13 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-13 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-13 does not appear to have a significant nexus with an identifiable WOTUS feature.

6.1.11 POTENTIAL WETLAND W-14

Potential wetland W-14 is located in the eastern third of the Subject Site's WS-1 near the center and west of W-12. W-13 appears to be a constructed farm pond with a berm along the east side. No water was present in W-13 during the site visit. W-13 is completely within the WS-1 Subject Site boundary. The determination location was at latitude 36.172346, longitude -96.190646 **(Appendix A, Figure 8-1)**. Water primrose and pinkweed dominated the herbaceous stratum. The size of this potential wetland is approximately 0.1.11 acres. The hydric soils were consistent with redox dark surface matrix (F6). Hydrological features consisted of surface water, saturation, aquatic fauna and true aquatic plants. All public available data sources identified W-14 as a potential wetland including a NWI designation of PUBFh (NWI 3) **(Table 1)**. A photograph of W-14 can be found in **Appendix B,**

Photographic Log. The completed wetland determination datasheet for W-14 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-14 does appear to have a significant nexus with an identifiable WOTUS feature. W-14 appears to overflow into W-12. W-12's significant nexus with Shell Creek has previously been discussed.

6.2 WS-2 POTENTIAL HYDRIC FEATURES

Four potential wetland features were observed WS-2 and include W-1 through W-3 and S-2. The field identified potential wetlands include two freshwater ponds and one emergent wetland and one stream segment. The inserted clip of **Figure 8-2** indicates the location and size of each potential wetland in WS-2. The following WS-2 potential wetlands include:

Figure 8-2. W-2 with field determined wetland features that exhibit all three hydric characteristics.

6.2.1 POTENTIAL WETLAND W-1

Potential wetland W-1 is located in the eastern half of the Subject Site's WS-2 near the northern border. This feature appears to be an excavated pond with a constructed berm along the southern edge. Water appears to be persistent throughout the year. W-1 is completely within the Subject Site boundary. No water was flowing in or out of this feature during the site visit. The determination location was at latitude 36.172764, longitude -96.198287 **(Appendix A, Figure 8-2)**. Tree stratum was dominated by green ash (*Fraxinus pennsylvanica*) and eastern red cedar (*Juniperus virginiana*) while broadleaf cattail (*Typha angostifolia*) dominated the herbaceous stratum. The size of this potential wetland is approximately 0.31 acres. The hydric soils consisted of Loamy Gleyed Matrix (F2). Hydrological features consisted of surface water, saturation, and true aquatic plants. All public available data sources identified W-1 as a potential wetland including a NWI designation of PUSCh (NWI 9) **(Table 1)**. A photograph of W-1 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-1 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-1 does not appear to have a significant nexus with an identifiable WOTUS feature.

6.2.2 POTENTIAL WETLAND W-2

Potential wetland W-2 is located in the western half of the Subject Site's WS-2 near the center of WS-2. This feature appears to be the lower portion of the drainage channel located on the western slope of the eastern watershed. An access road with a placed culvert pipe is located east of the wetland. It appears that the natural flow of the drainage has been altered by the construction of the access road. This constructed access road may contribute to retention of runoff from the western slope. No water was flowing through W-2 or the culvert pipe during the site visit, although there was standing water within W-2 at the time the determination was completed. During runoff events, water appears to flow from the west to the east through W-2. This runoff water would then confluence with D-2 (discussed below) on the east of the access road. The determination location was at latitude 36.164736, longitude -96.200233 **(Appendix A, Figure 8-2)**. The area of this potential wetland within the Subject Site is approximately 0.08 acres. Broadleaf wood-oats (*Chasmanthium latifolium*) and pinkweed dominated the sparse herbaceous stratum. The shrub stratum was dominated by green ash and black willow. The hydric soils consisted of a Sandy Redox (S5) on top of a Loamy Gleyed Matrix (F2) within the top eighteen inches. Hydrological features consisted of surface water and water-stained leaves which were observed throughout W-2. Aerial photographs identified a potential wetland in the vicinity of W-2 **(Table 1)**. A photograph of W-2 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-2 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-2 does appear to have a possible significant nexus with an identifiable WOTUS feature. During periods that water would flow from W-2, flow from W-2 would pass through D-2 and D-3 into S-2 (D-2, D-3 and S-2 will be discussed below).

6.2.3 POTENTIAL WETLAND W-3

Potential wetland W-3 is located in the southwest quarter of the Subject Site's WS-2. W-3 appears to be a freshwater pond located within the upper reaches of a drainage channel on the western slope. A constructed access road is elevated above the hillside and allows for the retention of runoff waters from the western slope. W-3 had no apparent spillway or overflow pipes that controlled water levels. No water was flowing in or out of this feature during the site visit. The determination location was at latitude 36.164009, longitude -96.203394 **(Appendix A, Figure 8-2)**. The size of this potential wetland is approximately 0.18 acres and is fully within the Subject Site. White oak (*Quercus alba*) dominated the tree stratum while pinkweed and coon's tail dominated the herbaceous stratum. The hydric soils consisted of a Sandy Redox (S5) and Redox Dark Surface (F6) within the top eighteen inches. Hydrological features include surface water and true aquatic plants were observed throughout W-3. No public available data source identified a potential wetland in the vicinity of W-3 **(Table 1)**. A photograph of W-3 can be found in **Appendix B, Photographic Log**. The completed wetland determination datasheet for W-3 is located in **Appendix C, Data Forms**. Based on the public and field data, it is SCS's opinion that W-3 does not appear to have a significant nexus with an identifiable WOTUS feature.

6.2.4 POTENTIAL WETLAND S-2

Potential wetland S-2 is located along the southern border of the Subject Site's WS-2. S-2 is a small segment along the south end of the NWI 8's drainage channel, within the Subject Site, exhibited ephemeral and/or intermittent steam characteristics (Table 1). S-2's stream segment begins at the southern end of D-3 (D-3 will be discussed below) (Appendix A, Figures 8-2). This short stream channel has a hard clay pan substrate with isolated pools. Substrate lacked loose silt, sand, gravel and cobble. The banks along S-2 were highly incised with vertical cuts of more than twenty feet in areas. This stream segment transitioned from D-3's clay pan substrate to clay-pan and large pools. Several of the pools had fish including sunfish (*Centrarchidae*). Soils along the channel edges and above the clay pan substrate appear to be highly erodible. Several locations along the bank walls showed stress cracks or had sloughed into the channel. High flow velocities appear to be common through S-2 as indicated by the steep incised banks and smooth clay-pan channel bottom. Although a wetland determination could not be determined due to the lack of wetland plants within the channel and clay soils that didn't exhibit hydric conditions, the persistent pools containing varying sizes of sunfish along the channel segment suggest that intermittent stream conditions are persistent. A review of the publicly available data indicates that NWI 8 has a confluence with the Arkansas River approximately one-mile south of the Subject Site. Based on the information available, it is SCS's opinion that S-2 has a significant nexus with WOTUS.

6.3 WS-3 POTENTIAL HYDRIC FEATURES

WS-3 had one potential wetland feature that will be discussed. This potential wetland is an ephemeral/intermittent stream. The inserted clip of Figure 8-3 indicates the location and size of the potential wetland in WS-3.

6.3.1 POTNETIAL WETLAND S-1

Potential wetland S-1 is located in the southern half of the Subject Site's WS-3. S-1 is the southern half of NWI 12 within the Subject Sites boundary **(Table 1)**. S-1 is approximately 4,494 feet (0.54 miles) long and appears to transition from a dry drainage channel (D-4) into an ephemeral and then an intermittent stream channel (D-4 will be discussed below) **(Appendix A, Figure 8-3)**. This transition was observed near the middle of the Subject Site's WS-3. The transition was determined where larger reaches of sandy substrate and an increase in hydric vegetation began to occur within and along the channel edges. This transitional area was topographically flatter compared to the northern reach. The upper S-1 channel reach contained small isolated pools scattered along a predominantly dry channel. No flowing water was seen between pools near the beginning of S-1. As the channel progressed down the watershed valley, the channel's sinuosity became apparent and width increased from four to six feet. Outside banks became more incised along east and west outside bends. The ordinary high water mark (OHWM) of the channel ranging from one to two feet. As the channel traversed south, the frequency and size of the pools increased with some small runs connecting a few of the pools

Figure 8-3. W-3 with field determined wetland features that exhibit the three hydric characteristics.

S-1's southern reach transitioned from an ephemeral to an intermittent stream segment. This segment had more persistent flow and began downstream a breached rock and cement dam. This dam is located in the southern half of the S-1 stream segment. The breach in the dam had no water flowing through it, but water was flowing from under the dam into a plunge pool located at the base of the dam. From this pool down to the southern boundary of the Subject Site, aquatic fauna, including fish and benthics, were observed numerous times. Hydric plants were dominant along the water's edge. A typical pool, riffle, run pattern could be observed throughout this reach of the channel. Gravel/sand bars occurred within the 6 to 20-foot-wide channel bottom. A review of the publicly available data indicates that NWI 12 has a confluence with the Arkansas River approximately one-mile south of the Subject Site. Based on the information available, it is SCS's opinion that S-1 has a significant nexus with WOTUS.

6.4 WS-4 POTENTIAL HYDRIC FEATURES

WS-4 had one potential wetland feature that will be discussed below. The inserted clip of **Figure 8-4** indicates the location and size of the potential wetland in WS-4.

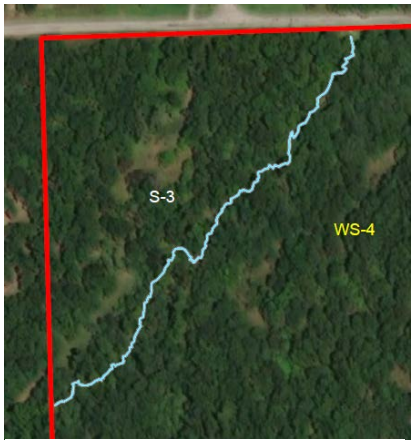


Figure 8-4. W-4 with field determined wetland features that exhibit all three hydric characteristics.

6.4.1 POTENTIAL WETLAND S-3

Potential wetland S-3 is located in the northwest quarter of the Subject Site's WS-4. S-3 corresponds with the segment of NWI 13 within the Subject Sites boundary **(Table 1)**. S-3 is approximately 1,285 feet (0.24 miles) long **(Appendix A, Figure 8-4)**. S-3 enters the Subject Site through a culvert under Anderson Road along the center of WS-4's northern border. S-3 traversed from the northeast to the southwest exiting the Subject Sites western border. Water flowing over sand and cobble was observed throughout S-3 segment. Most of the cobble stone was discolored with a thin algal layer. A pool, run riffle channel configuration exited through the S-3 reach. The width of the active channel was approximately four feet wide. The ordinary OHWS was approximately one foot above the water surface and was with a floodplain bench. The total width of the floodplain and stream was approximately twelve feet wide. A secondary bank, outside the floodplain, varied from three feet up to ten feet in height. Hydric plants dominated the floodplain while upland species dominated the secondary bank area. This stream segment is consistent with an intermittent/perineal stream. A review of the publicly available data indicates that NWI 13 has a confluence with Sand Creek approximately 1.900 feet southwest Subject Site. Based on the information available, it is SCS's opinion that S-3 has a significant nexus with WOTUS.

7 NON-QUALIFIED HYDRIC FEATURES

Non-qualified hydric features are potential wetland features that were identified from public available data sets, but after field assessed, failed to exhibit one or more of the three hydric characteristics previously discussed. The following features have been identified as non-qualified based off this criteria.

7.1 WS-1 NON-QUALIFIED HYDRIC FEATURES

One feature identified by public available data failed to exhibit the three hydric characteristics during field assessments. This feature is discussed below.

7.1.1 NON-QUALIFIED FEATURE D-5

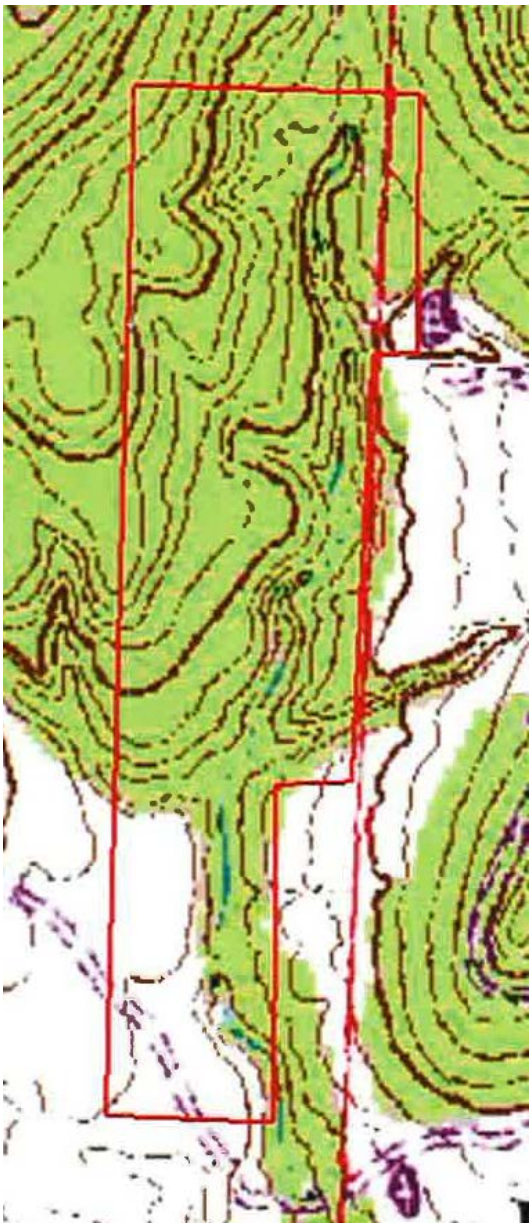
Non-qualified D-5 is located in the central portion of the Subject Site's WS-1 eastern border and beginning at the south end of W-12. D-5 is a dry channel that is a segment of the NWI feature identified in Table 1 as NWI 5. NWI 5 is described as a riverine wetland and appears to be associated with NWI 1 (W-12). D-5 began at an overflow pipe in the southern end of W-12 (Appendix A, Figure 9-1). This overflow pipe discharges into a well vegetated channel that traverses toward the southeast. No discharge from W-12 into D-5 was observed during the site visit. No water was observed within the channel during the site visit. D-5 did exhibit a defined channel, but existing conditions did not exhibit characteristics common with ephemeral or intermittent stream channels within the Subject Site. The channel didn't have a dominant hydric community within the Subject Site. It is SCS's opinion that this drainage segment does not met the USACE wetland criteria.

7.2 WS-2 NON-QUALIFIED HYDRIC FEATURES

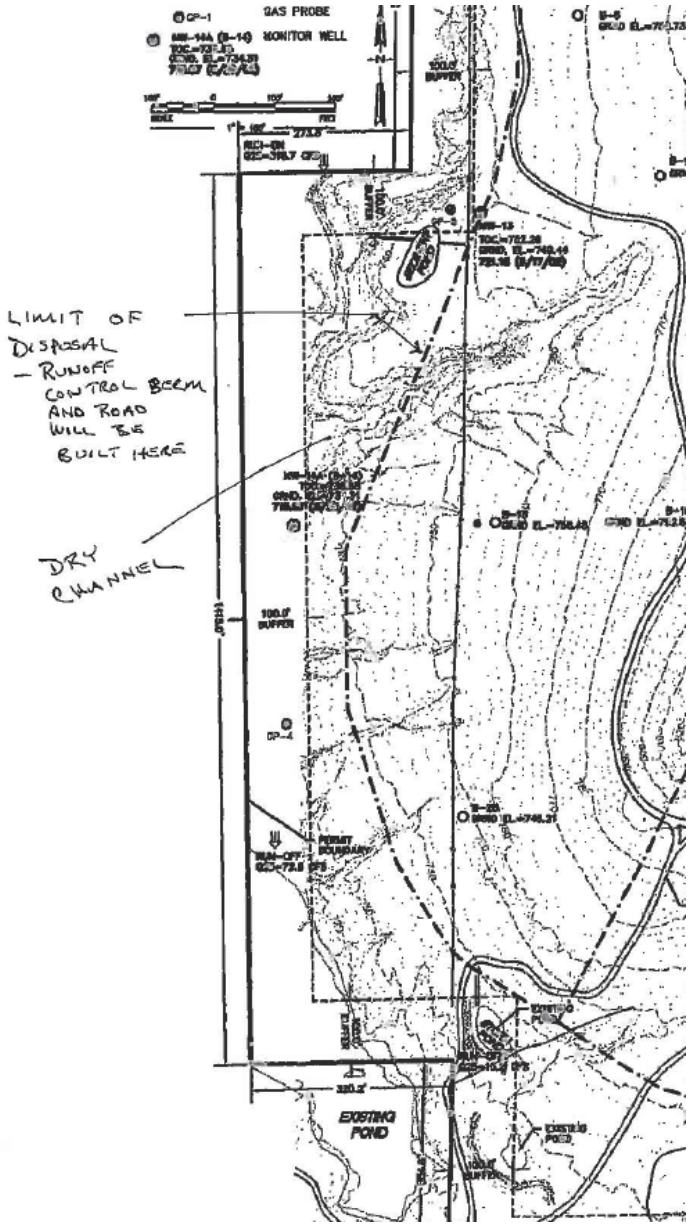
Three features in the Subject Site's WS-2 which were assessed for hydric features failed to exhibit all three USACE wetland characteristics. These three features are associated with NWI 8 riverine wetland feature that drains from the north to the south.

The USACE has identified an "unnamed tributary" (NWI-8) as a potential jurisdictional feature in a preliminary determination issued by the USACE on September 21, 2017 (Appendix D, Attachment 1). There was also a statement that the "property contains no jurisdictional wetlands". The scope of inquiry for the USACE "preliminary determination" was limited to the narrow reach along the southern 2/3 of the NWI-8 feature. Within this USACE September 21, 2017 determination report, the USACE identifies that only public available data was used to designate "a preliminary jurisdictional determination". SCS completed a similar public available data search and arrived at the same assessment that the drainage way identified as NWI-8 was a potential wetland feature and that a field confirmation should be completed. SCS also reviewed a prior JD request issued by the USACE on July 23, 2003 that stated that the then proposed expansion area did not require a permit as there were no identified jurisdictional waters that would be impacted as a result of the proposed expansion (APPENDIX D, Attachment 2). The two USACE JD assessments share a common boarder that is in proximity to the NWI-8 feature. As seen in the two figure inserts below, the west side of the 2003 JD

is the east side of the 2017 preliminary JD. The 2003 USACE reports state that no jurisdictional wetlands were identified within the assessment area, although the 2017 preliminary JD does identify the unnamed tributary. The entire reach of NWI-8 was assessed in the field. The result of the field assessment is in the discussion below.



Attachment 1. The east edge of the 2017 review request identifies the west edge of the 2003 proposed expansion permitted area.



Attachment 2. The west edge of the 2003 proposed expansion (dashed line) denote the edge of the landfill permit area.

7.2.1 NON-QUALIFIED FEATURE D-1

Non-qualified D-1 is located in the center of the Subject Site's WS-2 in through the middle of the north half of WS-2 traversing from the north to the south. Assessments began at the north end of D-1 drainage channel and stopped at the north end of an impoundment pool at the south end of D-1 (Appendix A, Figure 9-1). The pool is located north of a large stockpile of soil used by AEL. D-1's channel changed from an almost flat grassy channel to a steep boulder dominated wash. When water overflows from W-1, during wet periods, water flows into an approximate one-foot wide shallow drainage channel (D-1). This narrow channel appears to have a series of low head-cuts along the toe of W-1's constructed berm. This narrow channel transitions into a relatively flat grassy channel south of an access road. Below (south) the grassy waterway, the drainage channel transitioned into a steep boulder dominated channel with minimal channel definition. The drainage's elevation dropped approximately 50 feet over a 400-foot length of channel. At the bottom of these boulders, the channel's gradient leveled out. The substrate transitioned from large boulders to coble and small boulders in this lower reach. Assessment of D-1's potential hydric conditions stopped at the edge of impounded water. This impounded water appears to be the result of a large soil stockpile that has been placed through the WS-2 valley's bottom. Hydric plant dominancy and hydric soils were not observed along D-1's channel from the north to the south. It is SCS's opinion that this drainage segment does not met the USACE wetland criteria.

The pool associated with D-1's southern end was generated by the landfills soil stockpile by soil placed across the bottom of WS-2. Watermarks on the surrounding landscape suggests that the water level in this impoundment area has been more than ten feet above the levels observed during the site visit. A thin layer of grey sediment covered most ground features. During the site visit, there was a pump on the south end of this impoundment moving water into water trucks, which was being used for dust suppression of landfill activities. A wetland determination was conducted near the impoundment. Hydric soils and a dominant hydric plant community could not be determined for D-1's channel or impoundment. The review of aerial photographs showed that water first appeared in this impounded area in 2015. Upon assessing the length of D-1, the drainage channel exhibited a drainage way that conveys water to the south, but no hydric soils or dominant hydric plant communities were observed within the segment or along the edge of the impoundment pool. D-1 does not appear to be consistent with an ephemeral or intermittent stream and the pool at the southern end doesn't appear to have been a persistent pool long enough to allow for the propagation of hydric plants or the establishment of hydric soils. D-1 is located in the northern portion of NWI 8's riverine feature (Table 1). Although there is hydrological features that support discharge flows it is SCS Engineers opinion that the lack of wetland plants and hydric soils dis-qualifies this feature as a wetland as indicated by USACE criteria.

7.2.2 NON-QUALIFIED FEATURE D-2

Non-Qualified D-2 is located in the southern half of the Subject Site's WS-2. D-2 was assessed for a wetland but failed to exhibit all three wetland characteristics (Appendix A, Figure 9-2). In historic aerial photographs, this area could be seen with a narrow drainage channel prior to 2015. In aerial photographs for 2016 through 2018, the area D-2 can be seen with varying conditions including being inundated with water and dry with a wide grey colored channel bottom. D-2 has an access road crossing in the southern quarter. This access road has three culvert pipes connecting the northern section to the southern section tying these two sections together. The plant community within the

channel expressed a varying level of FACW (pinkweed) and UPL (sunflowers) plant species. The substrate throughout D-2 is sand. The soil profile for the channel consisted of a 10YR 4/6 for the top 18 inches. No redox or reductions zones were observed. These soil conditions suggest that extended periods of continuous saturation may not occur. D-2 appears to receive runoff with sedimentation from the active landfill. Discussion with AEL staff indicated that the area identified as D-2 is used as a storm-water sedimentation basin.

The southern end of D-2 was partially filled in and flush with the surrounding land. The fill was being placed to create a working deck for an excavator to remove the sediment from the storm-water sedimentation basin and restore to original depths. The area that was being filled-in is where the NWI 11 freshwater pond is indicated **(Appendix A, Figure 3)**. A ditch located south of D-2 and along the southern most reach of NWI 8 was vegetated with upland plants. No hydric plants were observed within this ditch. There was no observed discharge point from D-2 into this southern ditch. This indicated stream reach did not exhibit stream characteristics. Although the south ditch area may have received water from the upper reaches of NWI 8 at one time, there was no visible signs that flows through this southern ditch area was still occurring.

Water that flows through D-2 discharges into an incised channel (D-3) located along the southwest corner of D-2 and south of the access road crossing. This incised channel begins with a large head cut that is approximately four feet deep and is the connecting point with D-2. D-3 will be discussed below. Although there are hydrological features, the clean scoured channel bottom and a lack of bank edge vegetation indicated that flows through this feature are fast and limited to runoff events. It is SCS's opinion that the lack of hydric soils with an active head-cut near D-2 dis-qualifies this feature as a potential wetland.

7.2.3 NON-QUALIFIED FEATURE D-3

Non-Qualified D-3 is located along the southern boundary of the Subject Site's WS-2 and west of D-2's southern end. D-3 was assessed but failed to exhibit all three wetland characteristics **(Appendix A, Figure 9-2)**. D-3 is an incised channel that originates from the west side of D-2's southwestern corner. D-3 initially traverses west before turning to the south **(Appendix A, Figure 9-2)**. D-3's substrate consisted of a thin sandy bottom near the discharge point from D-2 and transitioned into a smooth clay-pan bottom with minimal sand coverage. The sandy substrate observed in D-3's upper reach was similar to D-2 sandy substrate. The clay-pan under the sandy substrate was a restrictive layer when shovel tested. The southern half of D-3 transitioned into a steeper gradient hard clay-pan channel. Incised banks ranged from approximately 3 feet near the D-2 outfall to approximately 20 feet near the southern end of D-3. Several areas of incised banks were unstable and multiple locations had sloughed material in the channel. The channel's width ranged from ten to 15 feet wide. No plants, surface water, seeps, or springs were observed along D-3's channel bottom. The southern end of D-3's transitioned to a hard clay pan channel bottom with pools. This transition is the identified beginning of the intermittent stream previously discussed as S-2 **(Appendix A, Figure 9-2)**. D-3's channel appears to be maintained by high flow velocities with little to no sediment deposition on the southern half's clay-pan substrate. A conducted shovel test was restricted by the hard clay-pan and revealed that no hydric soils could be determined to due to lack of suitable soils above the clay-pan layer. Plant species were restricted to the top of the incised banks and were not hydric. Although there are hydrological features that support high flow events, it is SCS's opinion that the lack of wetland plants and hydric soils dis-qualifies this feature as a potential wetland.

7.2.4 REMOVED NWI 10

The NWI 10 freshwater pond that was identified in WS-2 publicly available data review could not be located during the site visit. NWI 10 stopped appear in aerial photographs after 2011, NWI 10 was no longer visible. This feature appears to have been removed as the result of AEL operations. This feature was not located during the site visit.

7.3 WS-3 NON-QUALIFIED HYDRIC FEATURES

One feature identified by public available data in the WS-3 failed to exhibit the three hydric characteristics identified by the USACE for wetland features. This feature is discussed below.

7.3.1 NON-QUALIFIED FEATURE D-4

Non-Qualified D-4 is located in the northern half of the Subject Site's WS-3. A drainage channel (D-4) approximately 3,243 feet (0.45 mile) long **(Appendix A, Figure 8)**. This drainage channel transitioned from a dry drainage channel at the north end to an intermittent stream along the south end **(Appendix A, Figures 8-3 and 9-3)**. Channel assessments started downstream of a culvert pipe under Anderson Road along the north edge of the Subject Site. This north reach was narrow averaging about three feet wide and approximately one foot in depth. The edge of the channel was dominated by upland vegetation. Little to no vegetation was in the channel bed which was predominantly large flat slate stones and occasional gravel beds. No standing water was observed within the northern half of NWI 12. Soils, where sampled within the channel, were dominated by sand and coarse gravel. No hydric soil conditions were observed. Other than the drainage channel, no observable hydric characteristics were observed along the northern section of NWI 12. Several smaller drainage channels had confluences with the assessed drainage channel. None of these smaller drainages were discharging water into the assessed drainage channel. The lack of hydric vegetation and soils throughout the D-4 channel section does not exhibit characteristics typically associated with either ephemeral or intermittent stream channels. Although there are hydrological features that support discharge flow events, the lack of wetland plants and hydric soils dis-qualifies this feature as a potential wetland.

8 SUMMARY

Upon completion of field determinations and delineations a total off seventeen potential wetlands were identified within the Subject Site (Table 1) (Appendix A, Figure 8). These include:

- WS-1 hydric features
  - Eleven wetlands
    - Six freshwater ponds
      - W-9 through W-14
    - Five emergent wetlands
      - W-4 through W-8
- WS-2 hydric features
  - Three wetlands
    - Two freshwater ponds
      - W-1 and W-3
    - One emergent wetland
      - W-2
  - One stream segment
    - S-2
- WS-3 hydric feature
  - One stream segment
    - S-1
- WS-4 hydric feature
  - One stream segment
    - S-3

Several features identified by public available sources did not exhibit all three USACE wetland characteristics when assessed in the field. These features are described as non-qualified hydric features and are being discussed because they appeared on public available datasets that are used to help locate and identify hydric features. These public data sources do identify that their information may not be accurate and that a site visit is typically needed to verify the accuracy of the available data. SCS completed the site visit and assessed these previously discussed features to determine if the mapped features exhibit all three wetland characteristics defined by the USACE. These that did not exhibit one or more hydric characteristics include:

- WS-1
  - NWI 5 – A riverine feature that did not have a dominant hydric plant community
- WS-2
  - NWI 8 – A riverine feature that did not have a dominant hydric plant community and hydric soils. This feature was identified as D-1 and D-2.
  - NWI 10 – This feature was not located due to the construction and surface modification of the current facility operations.
  - NWI 11 - This feature is near the lower end of D-2. Fill was being placed in this area to create a working deck for an excavator to remove the sediment from the storm-water sedimentation basin and restore to original depths.

- WS-3
    - NWI 12 – This upper channel reach failed to exhibit a dominant hydric plant community.

A total of twenty-five potential wetland features were documented in this report. Of these twenty-five, twenty-two were assessed during the field site visit. Seventeen of these twenty-two potential wetland features exhibited the three characteristics that the USACE use to identify wetlands. The need for jurisdictional oversight by the USACE, a significant nexus must exist with WOTUS. Six of the seventeen identified potential wetland appear to have a significant nexus and are therefore, in SCS's opinion, are subject to jurisdictional oversite. These six features include three wetlands and three stream segments:

- S-1 – Nexus with the Arkansas River
- S-2 – Nexus with the Arkansas River
- S-3 – Nexus with Sand Creek
- W-2 – Nexus with the Arkansas River
- W-12 – Nexus with Shell Creek
- W-14 – Nexus with Shell Creek

9 CONCLUSION

SCS completed a site assessment for a proposed lateral expansion at AEL. The project area is approximately 463 acres and is located west and north of the existing landfill. Twenty-five features were identified and discussed within this report. Of the twenty five discussed features, twenty-two were assessed within the field. A review of public available information identified thirteen potential wetland features. SCS identified and delineated seventeen potential wetland features within the Subject Site (W-1 through W-14 and S-1 through S-3). Of the seventeen features that exhibited the three USACE identified wetlands characteristics, six of these features also exhibited a significant nexus with WOTUS. After reviewing public data and completing a field assessment of the Subject Site, a significant nexus could be determined for three identified wetlands (W-2, W-12, and W14) and for three stream segments (S-1, S-2, and S-3). It is SCS's opinion that these six features are subject to the USACE oversight and any modifications, alterations, or impacts that may occur to these features as a result of the proposed expansion would require prior approval from the USACE. SCS recognizes that the USACE has the official authority to make rulings on jurisdictional determinations for WOTUS. This report is being supplied to help provide site-specific data to assist the USACE with their jurisdictional determination on the potential wetlands discussed within this report.

10 GENERAL COMMENTS

This report includes analysis of the available information. Conclusions drawn by others from the results of this work should recognize the limitation of the methods used. Please note that SCS does not warrant the work of regulatory agencies or other third parties supplying information used in assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering practices, within the constraints of the client's directives. It is intended for the exclusive use of the client for specific application to the assessed property. No guarantees, express or implied, are intended or made.

11 REFERENCES

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12 GLOSARY

USACE – United States Army Corps of Engineers

WOTUS – Waters of the United States

WS – Watershed

W-# - Field determined wetland

S-# - Field determined stream channel

D-# - Non-Qualified hydric feature

CWA – Clean Water Act

NWI – U.S. Fish and Wildlife Service National Wetland Inventory

NHD – National Hydrography Dataset

FEMA – Federal Emergency Management Agency

USGS – United States Geological Service

NRCS – United States Department of Agriculture Natural Resource Conservation Service

Appendix A

Figures

Figure 1	Aerial Photograph of AEL Proposed Expansion
Figure 2	Aerial Photograph of AEL Proposed Expansion, Including Estimated Watershed Boundaries
Figure 3	National Wetland Inventory Map
Figure 4	Topographic Map of AEL Proposed Expansion
Figure 5	National Hydrography Dataset Map
Figure 6	FEMA Flood Hazard Zones
Figure 7	NRCS Soil Map Units
Figure 8	Delineated Wetland Boundaries
Figure 8-1	Delineated Wetland Boundaries for WS-1
Figure 8-2	Delineated Wetland Boundaries for WS-2
Figure 8-3	Delineated Wetland Boundaries for WS-3
Figure 8-4	Delineated Wetland Boundaries for WS-4
Figure 9	Assessed Drainage/Non-Wetland Boundaries
Figure 9-1	Non-Qualified Assessed Features for WS-1
Figure 9-2	Non-Qualified Assessed Features for WS-2
Figure 9-3	Non-Qualified Assessed Features for WS-3

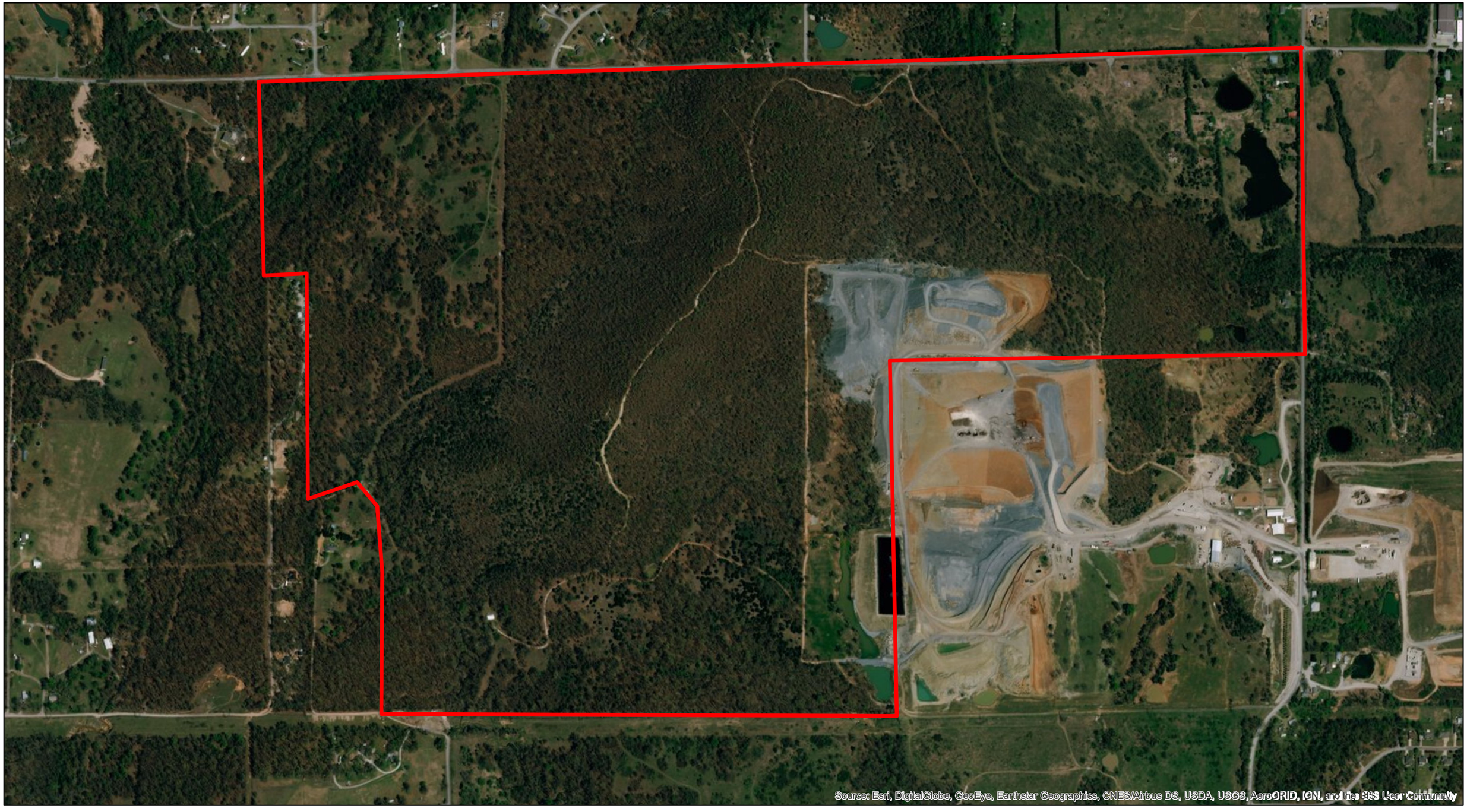

Figure 1. **Aerial Photograph of the AEL Subject Site**
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

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Feet

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SCS ENGINEERS
CONSULTING ENGINEERS, INC.
11120 E. 26th St. North, Suite 1100
Wichita, Kansas 67226
PH. (316) 315-4501

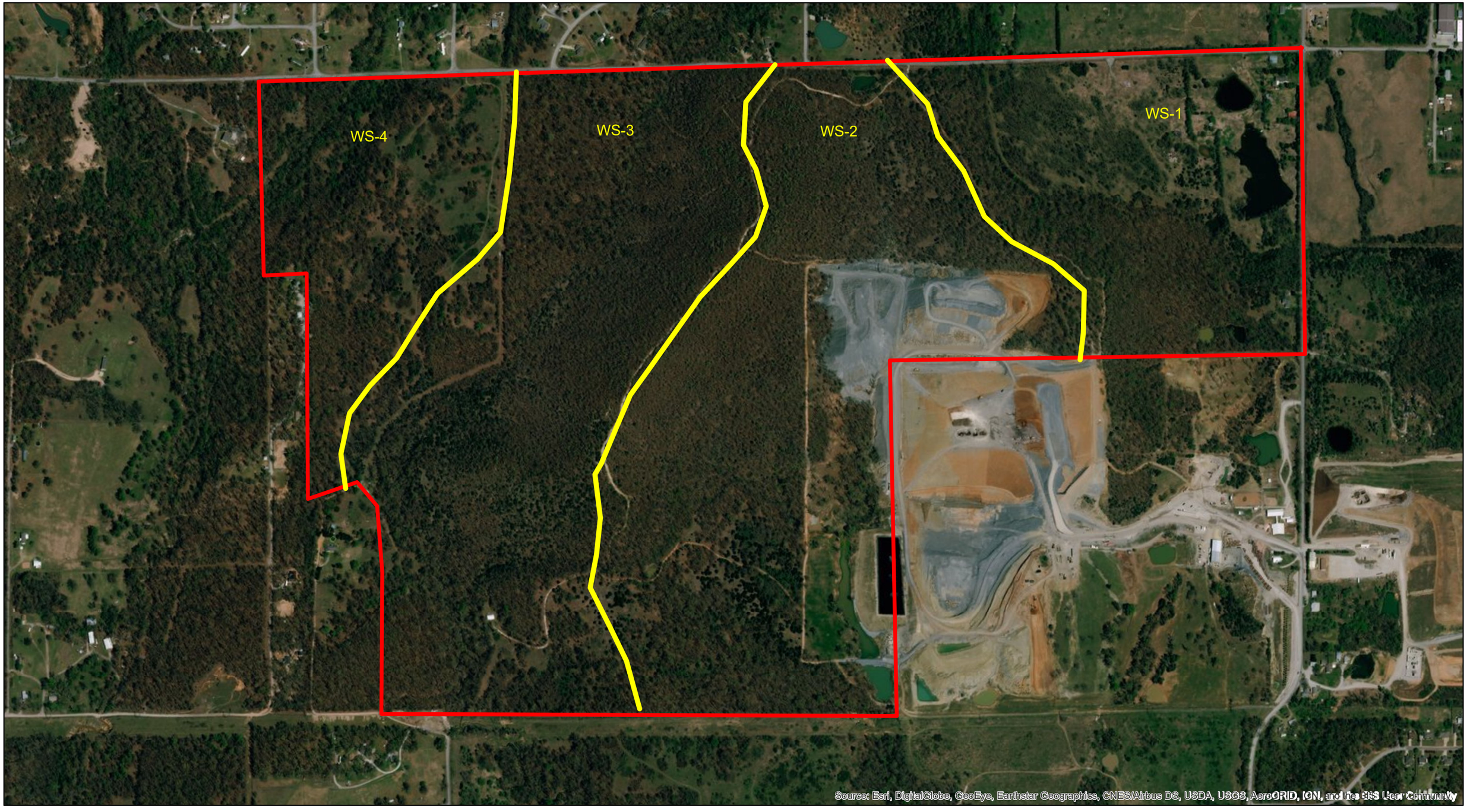

Figure 2.

Aerial Photograph of the AEL Subject Site
Including Estimated Watershed Boundaries
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 315 630 1,260 1,890 2,520
Feet

N

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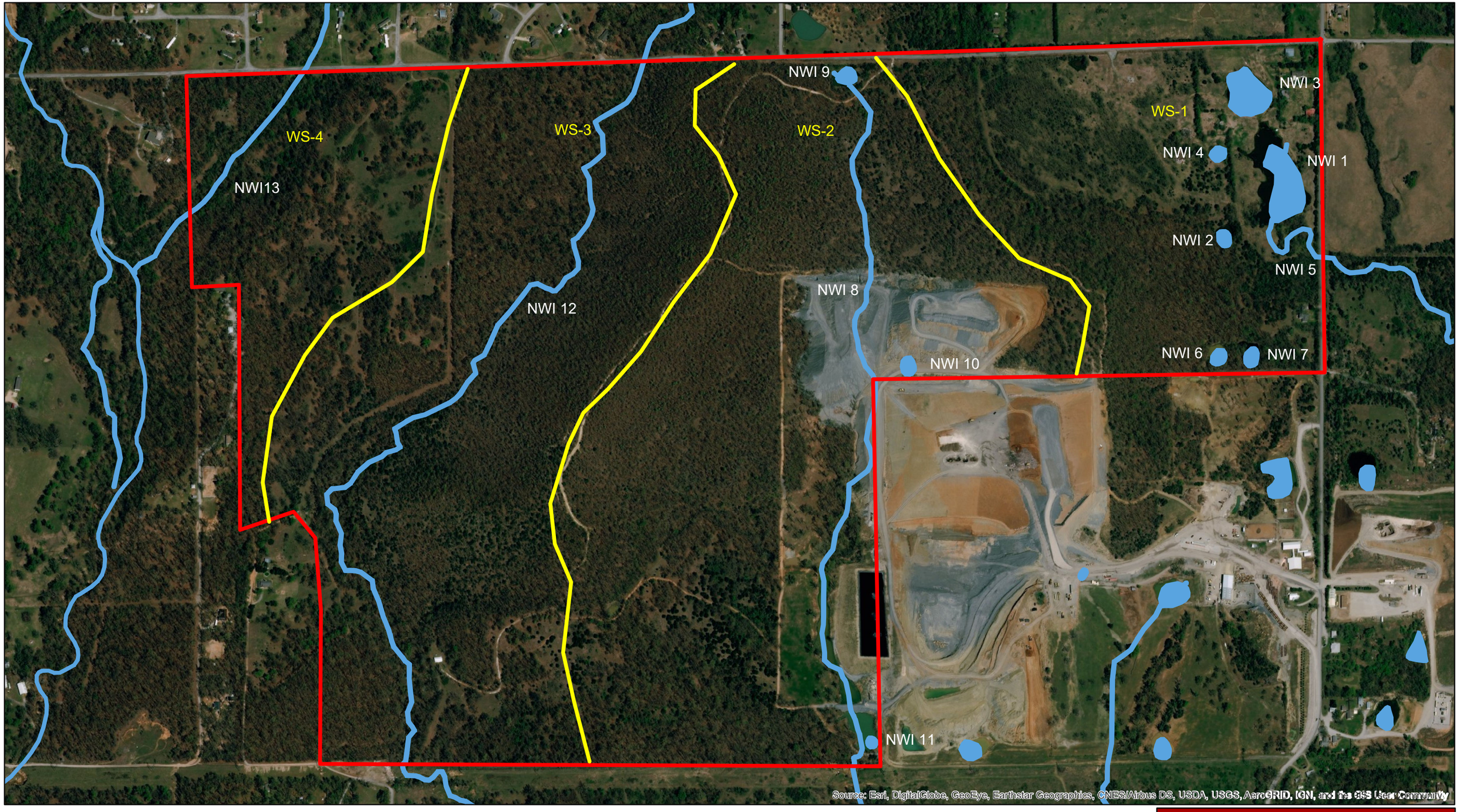

Figure 3.

National Wetland Inventory Map
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 285 570 1,140 1,710 2,280 Feet

N

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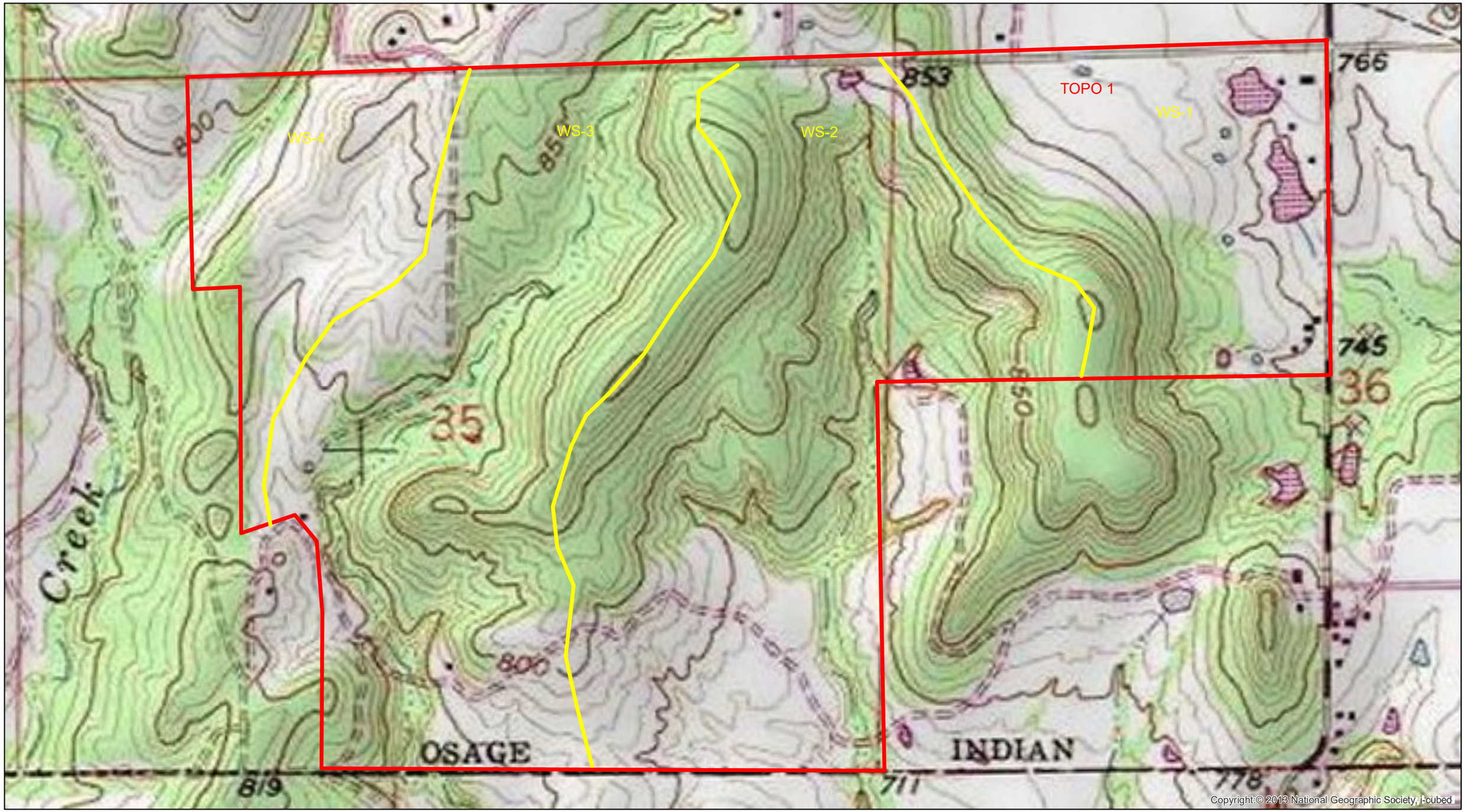

Figure 4. **Topographic Map of AEL Proposed Expansion**
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 285 570 1,140 1,710 2,280 Feet

N

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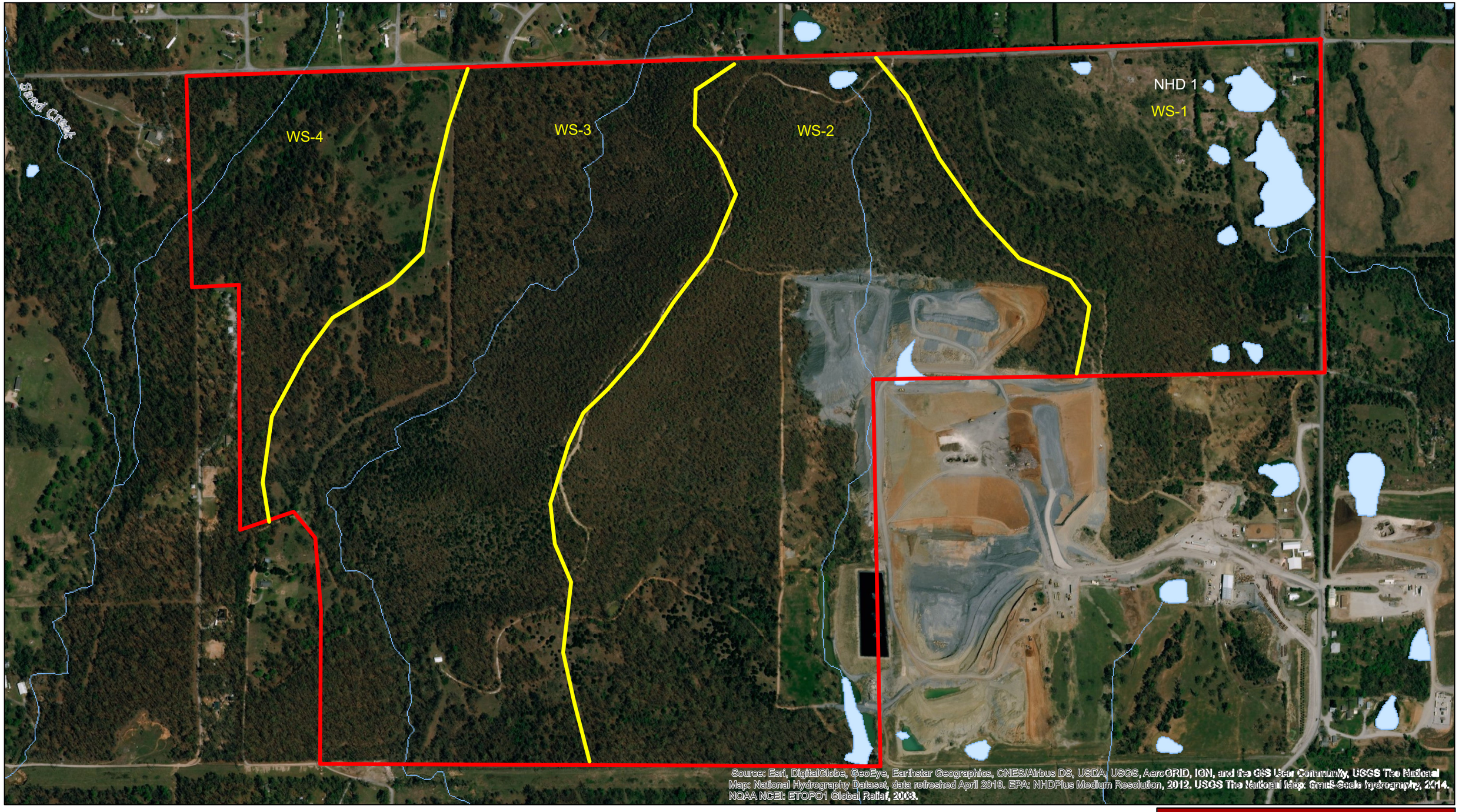

Figure 5.

National Hydrography Dataset Map
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 285 570 1,140 1,710 2,280 Feet

N

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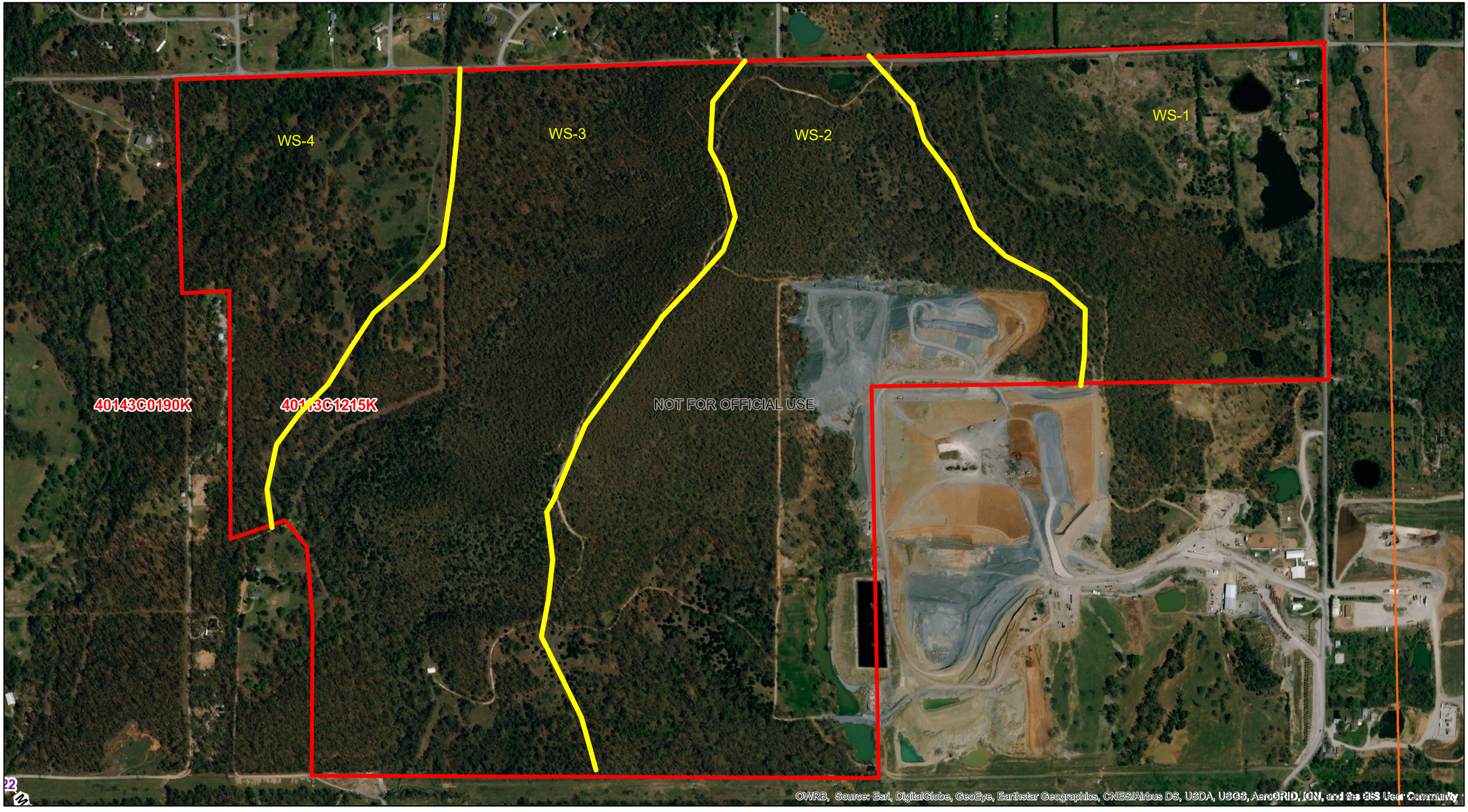

Figure 6.

FEMA Flood Harzard Zones
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 285 570 1,140 1,710 2,280
Feet

N

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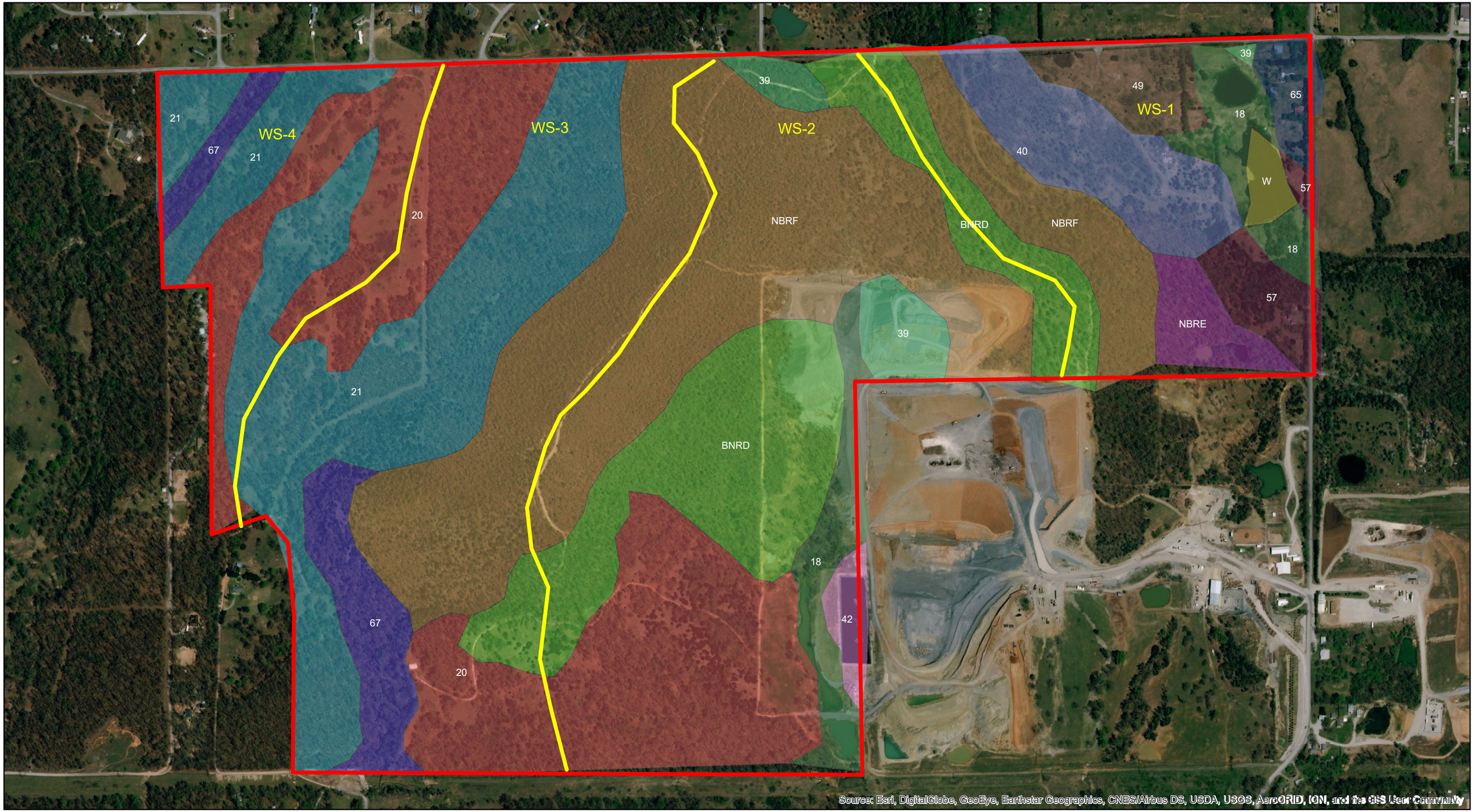

Figure 7.

NRCS Soil Map
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 285 570 1,140 1,710 2,280 Feet

N

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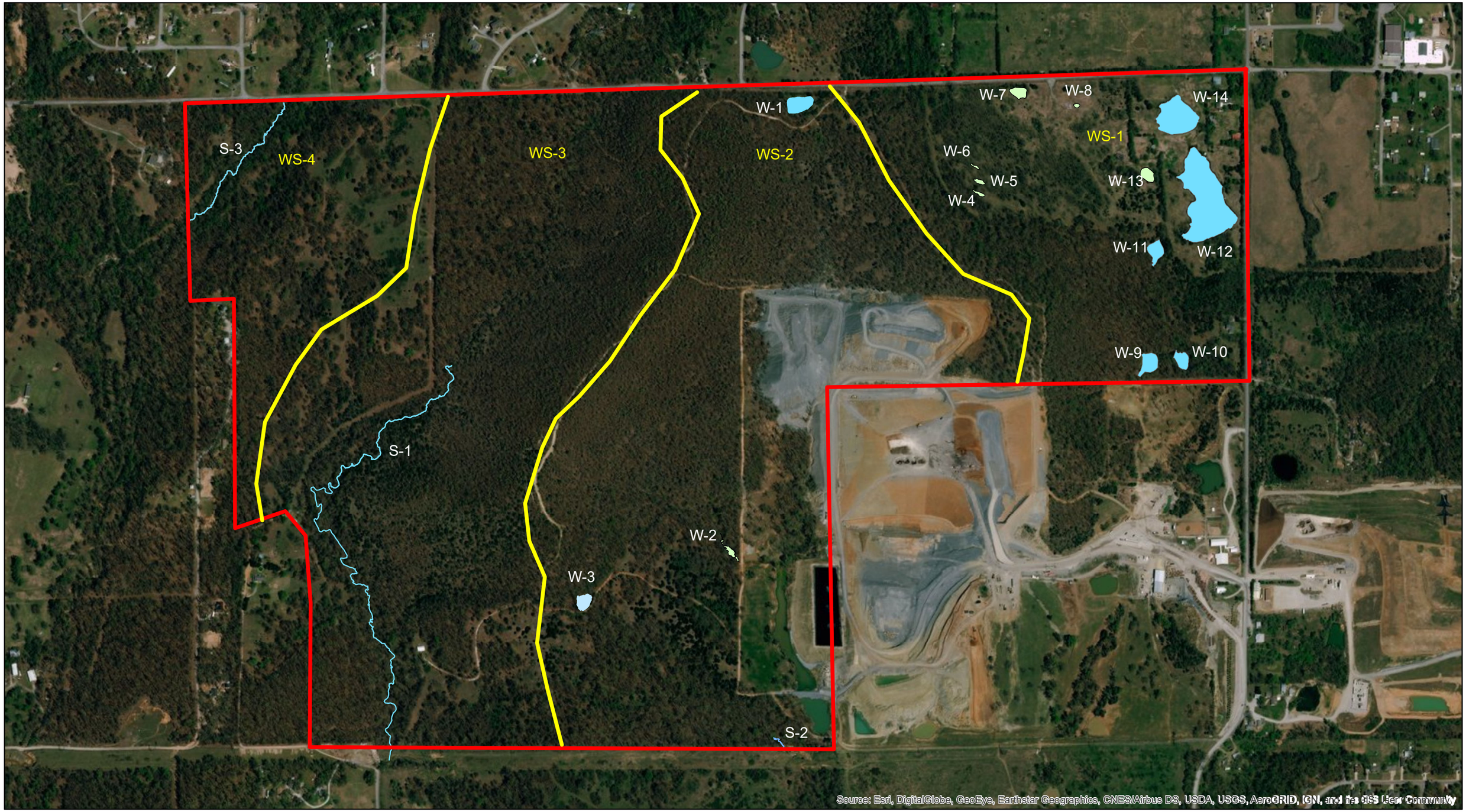

Figure 8.

Delineated Wetland Boundaries
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 310 620 1,240 1,860 2,480 Feet

N

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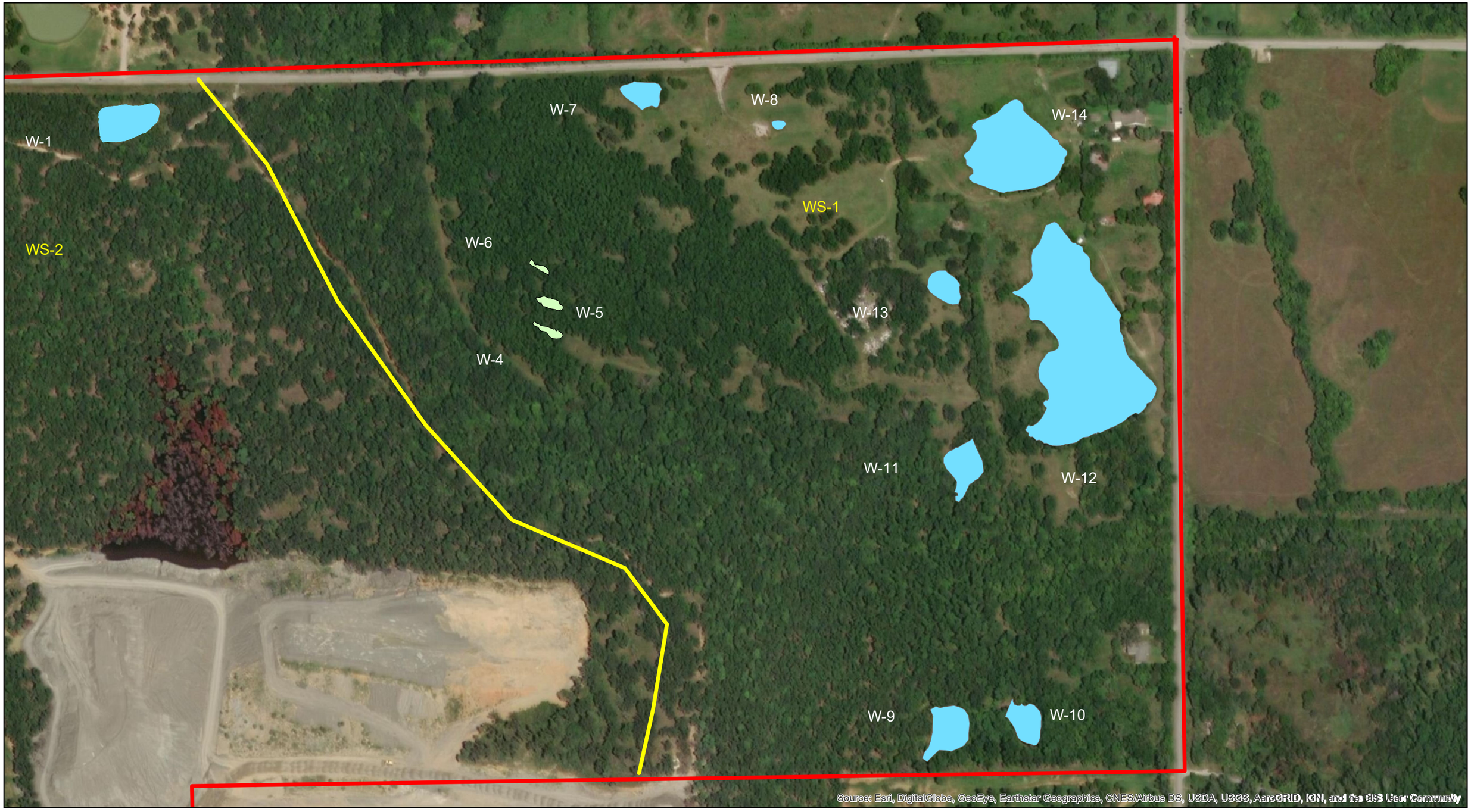

Figure 8-1.

Delineated Wetland Boundaries for WS-1
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 130 260 520 780 1,040 Feet

N

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Figure 8-2.

Delineated Wetland Boundaries for WS-2
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 155 310 620 930 1,240 Feet

N

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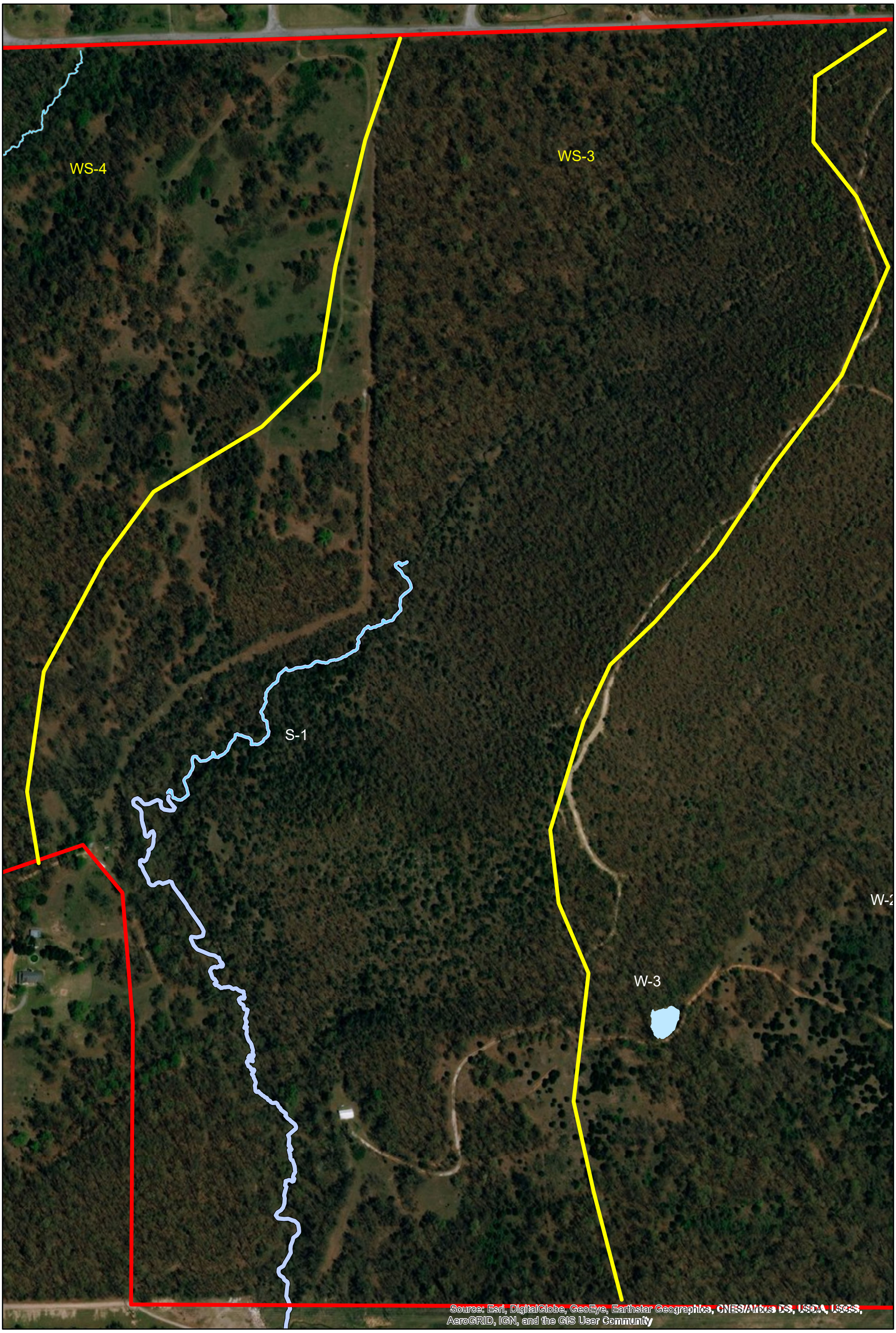

Figure 8-3.

Delineated Wetland Boundaries for WS-3
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 155 310 620 930 1,240 Feet

N

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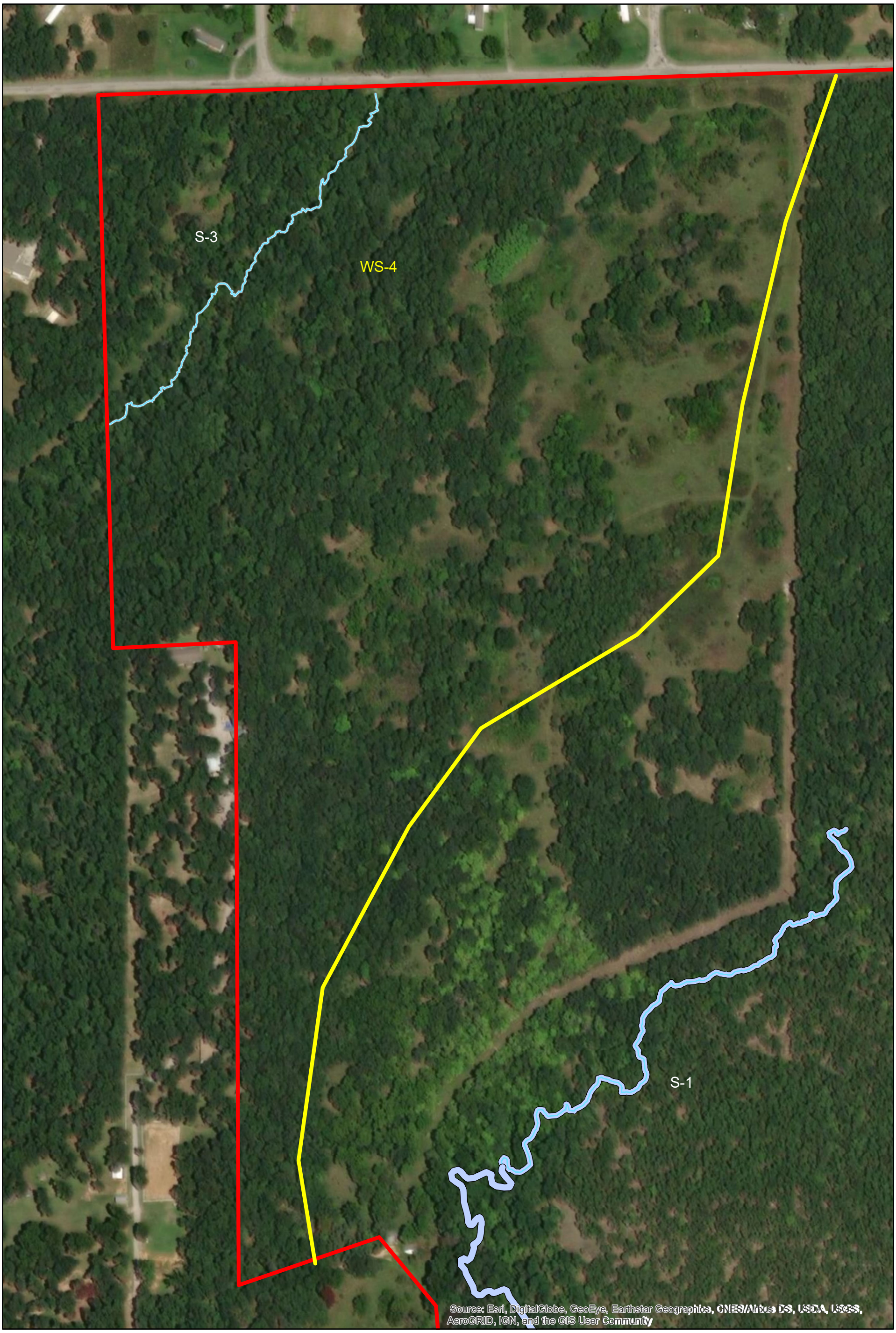

Figure 8-4.

Delineated Wetland Boundaries for WS-4
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 110 220 440 660 880 Feet

N

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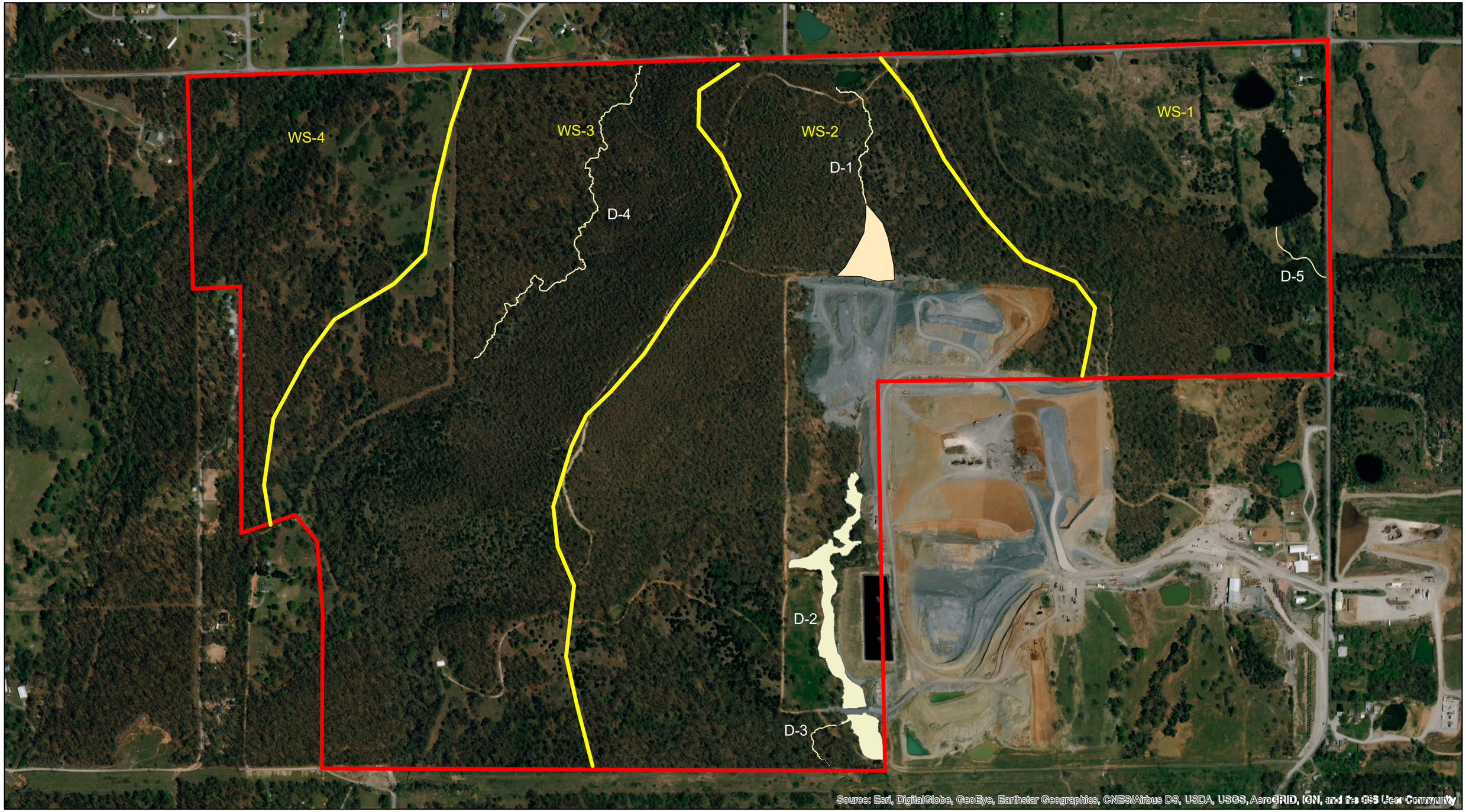

Figure 9.

Non-Qualified Assessed Features
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 285 570 1,140 1,710 2,280 Feet

N

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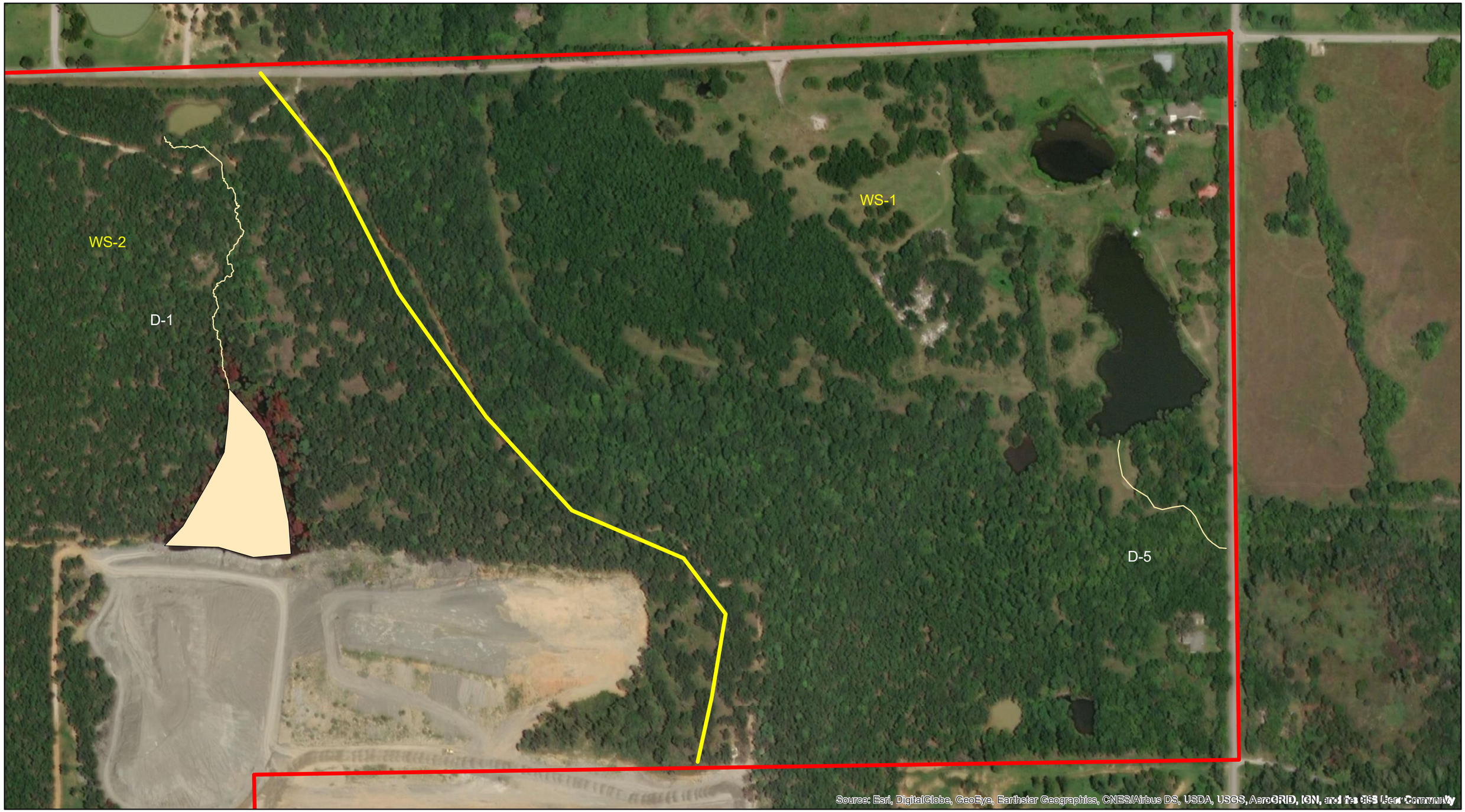

Figure 9-1. **Non-Qualified Assessed Features for WS-1**
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 130 260 520 780 1,040 Feet

N

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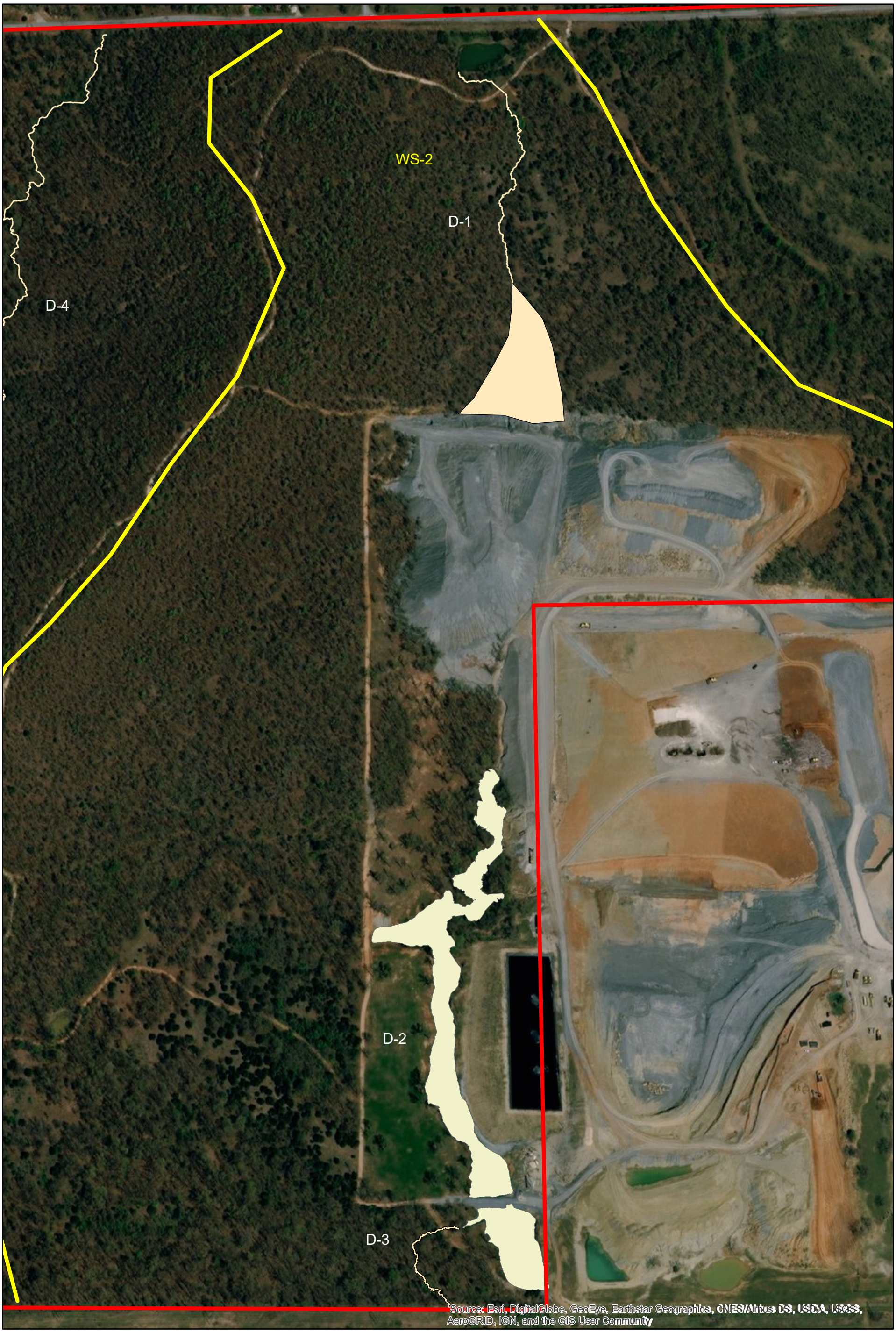

Figure 9-2.

Non-Qualified Assessed Features for WS-2
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 155 310 620 930 1,240
Feet

N

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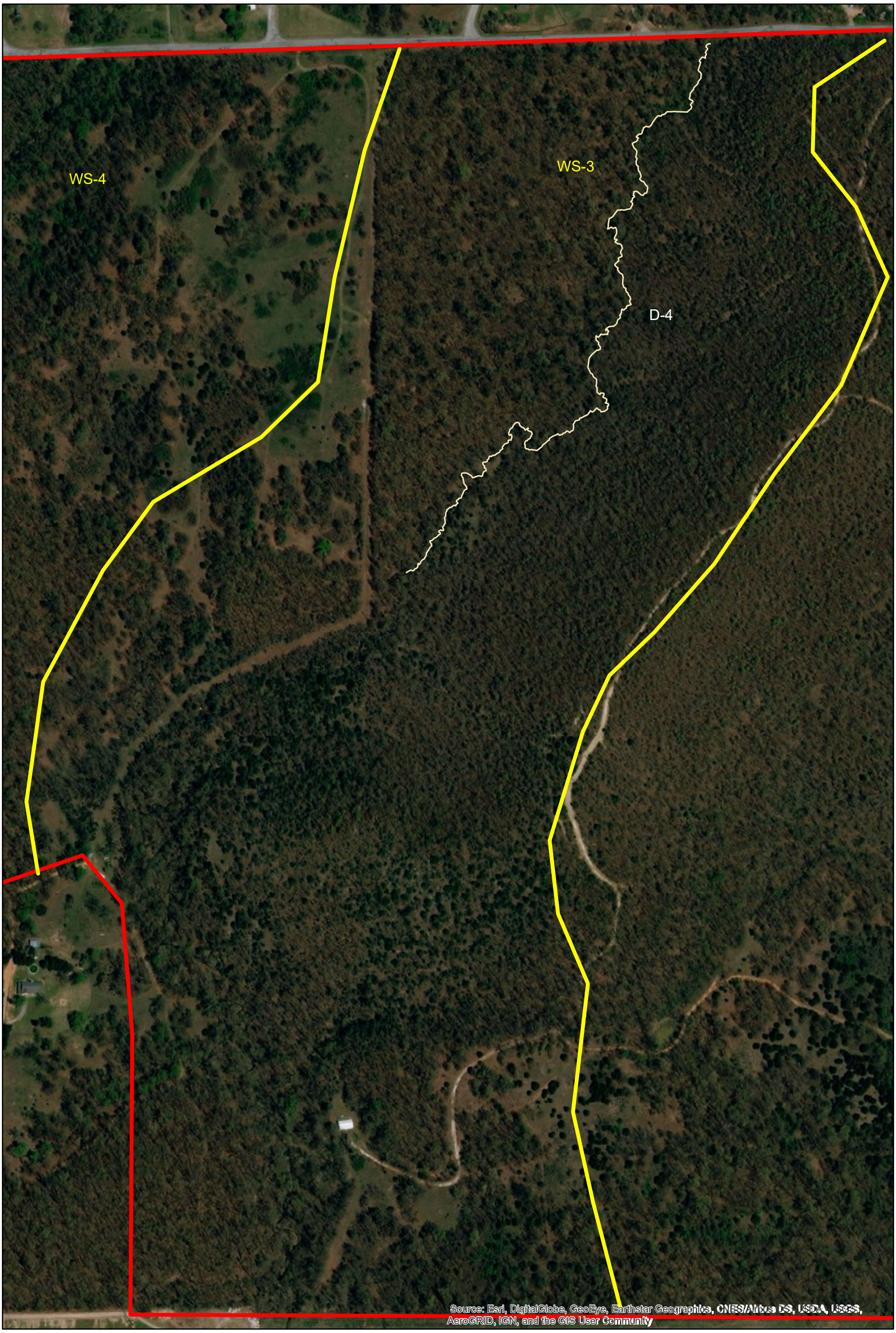

Figure 9-3.

Non-Qualified Assessed Features for WS-3
AEL Proposed Expansion
Osage County, Oklahoma
August 9, 2018

0 155 310 620 930 1,240
Feet

N

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Appendix B

Photographic Log

Photograph 1

Taken by: V. Weaver

Date: May 24, 2018

Direction (facing): North

Description: W-1 determination location along southeast side. Broadleaf cattails along more than half of W-1 shoreline.

Photograph 2

Taken by: V. Weaver

Date: May 24, 2018

Direction (facing): East

Description: W-1 probable overflow location into D-1 channel.

Photograph 3

Taken by: V. Weaver

Date: May 24, 2018

Direction (facing): South

Description: Starting point of D-1 drainage. Note dry channel with erosion scours. Photograph taken close to where Photograph 2 was taken.

Photograph 4

Taken by: V. Weaver

Date: May 24, 2018

Direction (facing): South

Description: Steep drainage channel of D-1. Channel appears more of a wash without channel features.

Photograph 5

Taken by: V. Weaver

Date: May 24, 2018

Direction (facing): Northwest

Description: Taken from the soil stockpile at the south end of D-1. Pump and water truck used to drain water from area. Note the high water mark behind water truck.

Photograph 6

Taken by: V. Weaver

Date: May 24, 2018

Direction (facing): South

Description: The broad sanding bottom of D-2. The sparse vegetation. Picture is near the north end looking down the length of D-2.

Photograph 7

Taken by: V. Weaver

Date: May 24, 2018

Direction (facing): South

Description: The beginning of S-2 stream channel with isolated pools. Note tree leaning across channel. The tree had fallen over due to undercutting. Channel bottom is hard clay pan with little to no loose sediment. D-3 is similar without the isolated pools.

Photograph 8

Taken by: V. Weaver

Date: May 24, 2018

Direction (facing): West

Description: Southeast end of W-2 looking up the drainage way toward the surrounding hills. Surface water and stained leaves in the foreground.

Photograph 9

Taken by: V. Weaver

Date: May 25, 2018

Direction (facing): West

Description: Northeast end of W-3 shoreline vegetation. Water clarity was good and easy to see coon's tail under the surface.

Photograph 10

Taken by: V. Weaver

Date: May 25, 2018

Direction (facing): South

Description: Culvert pipe under Anderson Road at the beginning of D-4.

Photograph 11

Taken by: V. Weaver

Date: May 25, 2018

Direction (facing): South

Description: Typical channel for D-4 throughout reach. Note leaf litter that doesn't appear to be stained from water.

Photograph 12

Taken by: V. Weaver

Date: May 25, 2018

Direction (facing): West

Description: The top reaches of S-1 showing pools near outside bend of stream channel. Note the high outside bank.

Photograph 13

Taken by: V. Weaver

Date: May 25, 2018

Direction (facing): North

Description: The breached rock and cement dam. S-1 flows through breach. Pool at the bottom of picture is the start of persistent flowing water that continued to the southern Subject Site boundary.

Photograph 14

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): Northwest

Description: W-4 determination location. Note the sparse vegetative cover. The area was flat and near the toe of a hill to the west.

Photograph 15

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): North

Description: W-5 is similar to W-4 and near the toe of a hill west of the site. Again the sparse vegetation surrounded by a thick groundcover.

Photograph 16

Taken by: A. Garnsey

Date: May 25, 2018

Direction (facing): North

Description: W-6 is similar to W-4 and W-5.

These three wetlands were located on flat areas that could have been terraces or access roads.

Photograph 17

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): North-Northeast

Description: W-7. Emergent wetland located along the South Side of Anderson Road in Watershed 1 (WS-1). True aquatic plants and aquatic fauna present.

Photograph 18

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): West

Description: W-8. Emergent wetland located east of W-7. Flat-stem spike rush (*Eleocharis compressa*) was prevalent at the determination point.

Photograph 19

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): Northwest

Description: W-9 determination location. Constructed pond with permanent surface water and an emergent wetland fringe. True aquatic plants and aquatic fauna present

Photograph 20

Taken by A. Garnsey

Date: September 1, 2018

Direction (facing): North

Description: W-10 determination location. In close proximity to W-9; also appears to be a newly constructed pond with permanent surface water and an emergent wetland fringe. True aquatic plants and aquatic fauna present.

Photograph 21

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): East

Description: W-11 determination location. Constructed pond with permanent surface water and an emergent wetland fringe. True aquatic fauna present. Water was murky with thick layer of sediment on bottom.

Photograph 22

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): East

Description: W-12. Large constructed pond with permanent surface water and an emergent wetland fringe along portions of the perimeter. True aquatic plants and aquatic fauna present.

Photograph 23

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): NA

Description: Culvert observed along south boundary of W-12. Likely an over flow pipe that drains into mapped blue line (D-5) during high water events. Photo was taken on the pond side.

Photograph 24

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): West

Description: W-13. Appears to be an old constructed pond. No surface water was present, Berm along the east side of pond.

Photograph 25

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): Northeast

Description: W-14. Appears to be a constructed pond with a large emergent wetland fringe. True aquatic flora and fauna present.

Photograph 26

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): Northeast

Description: S-3 with narrow wetland fringe. Aquatic fauna present. Defined bed and bank.

Photograph 27

Taken by: A. Garnsey

Date: September 1, 2018

Direction (facing): Northeast

Description: S-3 culvert located south of Anderson Road.

APPENDIX C

DATA FORMS

Reset Form | Print Form

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 5/24/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-1

Investigator(s): V. Weaver, D. Daniels Section, Township, Range: Sec. 35, T20N, R10E

Landform (hillslope, terrace, etc.): Pond Local relief (concave, convex, none): Concave

Slope (%): 1-8 Lat: 36.172764 Long: -96.198287 Datum: WGS84

Soil Map Unit Name: Bigheart-Niotaze-Rock outcrop complex, 1 to 8 percent slopes NWI or WWI classification: PUSCh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	15	Y	FACW
2. *Juniperus virginiana*	10	Y	FACU
3.			
4.			
5.			
	25 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' Rad)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' Rad)			
1. *Typha angostifolia*	75	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: 30' Rad)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	75	x 1 =	75
FACW species	15	x 2 =	30
FAC species		x 3 =	0
FACU species	10	x 4 =	40
UPL species		x 5 =	0
Column Totals:	100 (A)		145 (B)

Prevalence Index = B/A = 1.45

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Plant species that were located along the shoreline and within the hydric soil ban were identified for this assessment. Plants that were located outside of the hydric soil ban and away from the shoreline were not included in this determination. The hydric soil reached approximately 2-3 feet from edge of water.

SOIL

Sampling Point: W-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	Gley 1 5/10Y	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- X True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 5/24/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-2

Investigator(s): V. Weaver, D. Daniels Section, Township, Range: Sec. 35, T20N, R10E

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.164736 Long: -96.200233 Datum: WGS84

Soil Map Unit Name: BNRD - Bigheart-Niotaze-Rock outcrop comples, 1 to 8 percent slopes NWI or WWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus muehlenbergii*	35	Y	FACU
2. *Fraxinus pennsylvanica*	25	Y	FACW
3. *Quercus alba*	10	N	FACU
4.			
5.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' Rad)			
1. *Cornus drummondii*	35	Y	FAC
2. *Salix nigra*	35	Y	OBL
3.			
4.			
5.			
	70	= Total Cover	
Herb Stratum (Plot size: 5' Rad)			
1. *Chasmanthium latifolium*	20	Y	FACW
2. *Persicaria pensylvanica*	15	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	35	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	60	x 2 =	120
FAC species	35	x 3 =	105
FACU species	45	x 4 =	180
UPL species		x 5 =	0
Column Totals:	175 (A)		440 (B)

Prevalence Index = B/A = 2.51

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Shrub and herb stratum plants that were within the drainage feature were assessed. Trees included had trunks located along edge of hydric feature.

SOIL

Sampling Point: W-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 4/3	100					Sand	No visible redox
6-7	7.5YR 4/3	50	5YR 4/6	50	C	M	Clay/Sand	Redox limited to this layer
7-18	Gley1 3/10Y	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

The redox features were predominantly within the 1 in layer between sandy soils on top and clay soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Pooling looked to be a result of a culvert placed in the channel slightly above grade of the wetland feature.

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WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 5/25/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-3

Investigator(s): V. Weaver, D. Daniels Section, Township, Range: Sec. 35, T20N, R10E

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.164009 Long: -96.203394 Datum: WGS84

Soil Map Unit Name: BNRD - Bigheart-Niotaze-Rock outcrop comples, 1 to 8 percent slopes NWI or WWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	30	Y	FACU
2.			
3.			
4.			
5.			
	30 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' Rad)			
1. *Fraxinus pennsylvanica*	20	Y	FACW
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 5' Rad)			
1. *Persicaria pensylvanica*	50	Y	FACW
2. *Ceratophyllum demersum*	20	Y	OBL
3. *Chasmanthium latifolium*	20	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 30' Rad)			
1. *Smilax rotundifolia*	5	Y	FAC
2.			
	5 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	85	x 2 =	170
FAC species		x 3 =	0
FACU species	30	x 4 =	120
UPL species		x 5 =	0
Column Totals:	135 (A)		310 (B)

Prevalence Index = B/A = 2.30

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

Filamentous algae along shoreline substrate.

SOIL

Sampling Point: W-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	7.5YR 4/2	85	5YR 4/6	15	C	M	Sand	
7-18	7.5YR 4/2	20	5YR 4/6	80	C	M	Clay/Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- X True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 0

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 4"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The pond appears to be a result of a constructed access road that was located along the east side of the pond. The natural drainage flows into this pond. No culvert pipe is located under the access road to allow impounded water to drain out. Outside of a drainage way, no additional hydric features were observed down gradient of access road and pond.

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WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 8/1/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-4

Investigator(s): V. Weaver, A. Garnsey-Zavala Section, Township, Range: Sec. 36, T20N, R10E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.171237 Long: -96.194620 Datum: WGS84

Soil Map Unit Name: 40 - Norge silt loam, 5 to 8 percent slopes NWI or WWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' Rad)			
1. *Carya. cordiformis*	5	Y	FACU
2. *Juniperus virginiana*	3	Y	FACU
3.			
4.			
5.			
	8 = Total Cover		
Herb Stratum (Plot size: 5' Rad)			
1. *Juncus interior*	40	Y	FAC
2. *Persicaria pensylvanica*	15	Y	FACW
3. *Coleataenia anceps*	15	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	30	x 2 =	60
FAC species	40	x 3 =	120
FACU species	8	x 4 =	32
UPL species		x 5 =	0
Column Totals:	78 (A)		212 (B)

Prevalence Index = B/A = 2.72

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

No trees were located within the delineated wetland area. A bitternut hickory provided canopy cover for more than 50% of the delineated wetland, but the trunk was located outside the delineated boundary.

SOIL

Sampling Point: W-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 2.5/1	100					Org	Humus layer
2-16	7.5YR 3/3	70	7.5YR 4/6	30	C	M	sand/sltlm	Redox limited to this layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Depression is located along a possible terrace or an old two-track road overgrown.

Reset Form | Print Form

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 8/1/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-5

Investigator(s): V. Weaver, A. Garnsey-Zavala Section, Township, Range: Sec. 36, T20N, R10E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.171350 Long: -96.194651 Datum: WGS84

Soil Map Unit Name: 40 - Norge silt loam, 5 to 8 percent slopes NWI or WWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' Rad)			
1. *Juniperus virginiana*	3	Y	FACU
2.			
3.			
4.			
5.			
	3 = Total Cover		
Herb Stratum (Plot size: 5' Rad)			
1. *Carex pellita*	40	Y	OBL
2. *C. interior*	20	Y	OBL
3. *Coleataenia anceps*	15	Y	FACW
4. *Persicaria pensylvanica*	10	N	FACW
5. *Rumex crispus*	5	N	FAC
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	25	x 2 =	50
FAC species	5	x 3 =	15
FACU species	3	x 4 =	12
UPL species		x 5 =	0
Column Totals:	93 (A)		137 (B)

Prevalence Index = B/A = 1.47

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

No trees were located within the delineated wetland area. A bitternut hickory provided canopy cover for more than 60% of the delineated wetland, but the trunk was located outside the delineated boundary.

SOIL

Sampling Point: W-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 2.5/1	100					Org	Humus layer
2-16	7.5YR 3/3	70	7.5YR 4/6	30	C	M	sand/silt/loam	Redox limited to this layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Depression is located along a possible terrace or an old two-track road overgrown.

Reset Form | Print Form

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 8/1/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-6

Investigator(s): V. Weaver, A. Garnsey-Zavala Section, Township, Range: Sec. 36, T20N, R10E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.171497 Long: -96.194658 Datum: WGS84

Soil Map Unit Name: 40 - Norge silt loam, 5 to 8 percent slopes NWI or WWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' Rad)			
1. *Carya cordiformis*	3	Y	FACU
2.			
3.			
4.			
5.			
	3 = Total Cover		
Herb Stratum (Plot size: 5' Rad)			
1. *Carex interior*	40	Y	OBL
2. *C. pellita*	20	Y	OBL
3. *Coleataenia anceps*	15	Y	FACW
4. *Schedonorus arundinaceus*	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 30' Rad)			
1. *Smilax hispida*	2	Y	FAC
2. *Lonicera japonica*	2	Y	FACU
	4 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	15	x 2 =	30
FAC species	2	x 3 =	6
FACU species	10	x 4 =	40
UPL species		x 5 =	0
Column Totals:	87 (A)		136 (B)

Prevalence Index = B/A = 1.56

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

No trees were located within the delineated wetland area. A bitternut hickory provided canopy cover for more than 60% of the delineated wetland, but the trunk was located outside the delineated boundary.

SOIL

Sampling Point: W-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 2.5/1	100					Org	Humus layer
2-16	7.5YR 3/3	90	7.5YR 4/6	10	C	M	sand/siltloam	Redox limited to this layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Depression is located along a possible terrace or an old two-track road overgrown.

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WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 8/1/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-7

Investigator(s): V. Weaver, A. Garnsey-Zavala Section, Township, Range: Sec. 36, T20N, R10E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.172836 Long: -96.193619 Datum: WGS84

Soil Map Unit Name: 49 - Parsons-Pharaoh complex, 0 to 3 percent slopes NWI or WWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus americana*	35	Y	FACW
2.			
3.			
4.			
5.			
	35 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' Rad)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' Rad)			
1. *Schoenoplectus tabernaemontani*	30	Y	OBL
2. *Persicaria pensylvanica*	40	Y	OBL
3. *Carex pellita*	25	Y	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	95	x 1 =	95
FACW species	35	x 2 =	70
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	130 (A)		165 (B)

Prevalence Index = B/A = 1.27

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Water primrose and duckweed observed outside of assessment area near the center of wetland area.

SOIL

Sampling Point: W-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5YR 3/1	85	7.5YR 4/6	15	C	P	Si/ClLm	
5-18	7.5YR 2.5/1	70	7.5YR 4/6	30	C	P/M	Cl-Lm	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- X True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 0

Water Table Present? Yes X No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The feature appears to be an old farm pond. The pond water level was low with only a small pool of water near the center.

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WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 8/1/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-8

Investigator(s): V. Weaver, A. Garnsey-Zavala Section, Township, Range: Sec. 36, T20N, R10E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.172682 Long: -96.192494 Datum: WGS84

Soil Map Unit Name: 49 - Parsons-Pharaoh complex, 0 to 3 percent slopes NWI or WWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' Rad)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5' Rad)			
1. *Eleocharis compressa*	65	Y	FACW
2. *Carex annectens*	20	Y	FACW
3. *Persicaria pensylvanica*	5	N	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = 0
FACW species 90	x 2 = 180
FAC species ____	x 3 = 0
FACU species ____	x 4 = 0
UPL species ____	x 5 = 0
Column Totals: 90 (A)	180 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 2.5/1	95	7.5YR 4/6	5	C	P	Si-Cl-Lm	
8-16	7.5YR 4/3	85	7.5YR 4/6	15	C	P/M	Cl	Hard soil at bottom

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Hard-pan soil

Depth (inches): 16

Hydric Soil Present? Yes X **No** ___

Remarks:

This depression area looks to be a borrow area for the pump-jack pad adjacent to the

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 8/1/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-9

Investigator(s): V. Weaver, A. Garnsey-Zavala Section, Township, Range: Sec. 36, T20N, R10E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.167974 Long: -96.190973 Datum: WGS84

Soil Map Unit Name: NBRE - Niotaze-Bigheart-Rock outcrop complex, 3 to 15 percent slopes, very ston NWI or WWI classification: PUBFh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Platanus occidentalis*	50	Y	FACW
2.			
3.			
4.			
5.			
	50 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' Rad)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5' Rad)			
1. *Certophyllum demersum*	45	Y	OBL
2. *Carex hystericina*	10	N	OBL
3. *Carex annectens*	5	N	FACW
4. *Mentha arvensis*	3	N	FACW
5. *Persicaria pensylvanica*	3	N	FACW
6.			
7.			
8.			
9.			
10.			
	66 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	55	x 1 =	55
FACW species	61	x 2 =	122
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	116 (A)		177 (B)

Prevalence Index = B/A = 1.53

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Bare ground consisted of approximately 40 percent of the ground cover.

SOIL

Sampling Point: W-9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 4/2	100					Si-Cl-Lm	
1-16	10YR 4/3	70	7.5YR 7/8	30	C	M	Cl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** ___

Remarks:

The shoreline appeared to have been recently maintained. Constructed berm along the east shorline.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- X True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): _____

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 8/1/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-10

Investigator(s): V. Weaver, A. Garnsey-Zavala Section, Township, Range: Sec. 36, T20N, R10E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.167888 Long: -96.190309 Datum: WGS84

Soil Map Unit Name: NBRE - Niotaze-Bigheart-Rock outcrop complex, 3 to 15 percent slopes, very ston NWI or WWI classification: PUBFh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' Rad)			
1. *Salix nigra*	3	Y	OBL
2. *Maclura pomifera*	3	Y	FACU
3.			
4.			
5.			
	6 = Total Cover		
Herb Stratum (Plot size: 5' Rad)			
1. *Carex grayi*	30	Y	FACW
2. *Carex hystericina*	15	N	OBL
3. *Veronica anagallis-aquatica*	15	N	OBL
4. *Mentha arvensis*	3	N	FACW
5. *Ceratophyllum demersum*	20	Y	OBL
6.			
7.			
8.			
9.			
10.			
	83 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	53	x 1 =	53
FACW species	33	x 2 =	66
FAC species		x 3 =	0
FACU species	3	x 4 =	12
UPL species		x 5 =	0
Column Totals:	89 (A)		131 (B)

Prevalence Index = B/A = 1.47

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Water level appears to be low allowing for an established nice hydric plant shoreline.

SOIL

Sampling Point: W-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 5/3	95	7.5 4/6	5	C	P	Si-Cl-Lm	
4-17	10YR 5/2	92	7.5YR 4/6	8	C	P	Cl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** ___

Remarks:

Clay in soil retained most of the parent color. Redox was limited to pores.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- X True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): _____

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 8/1/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-11

Investigator(s): V. Weaver, A. Garnsey-Zavala Section, Township, Range: Sec. 36, T20N, R10E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.170126 Long: -96.190927 Datum: WGS84

Soil Map Unit Name: 40 - Norge silt loam, 5 to 8 percent slopes NWI or WWI classification: PUSCx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 25' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus stellata*	10	Y	FACU
2.			
3.			
4.			
5.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' Rad)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10' Rad)			
1. *Eleocharis compressa*	40	Y	FACW
2. *Veronica anagallis-aquatica*	20	Y	FAC
3. *Asteraceae sp.*	10	N	UPL
4. *Phalaris arundinacea*	8	N	FACW
5. *Teucrium canadense*	3	N	FACW
6.			
7.			
8.			
9.			
10.			
	81 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	0
FACW species 51	x 2 =	102
FAC species 20	x 3 =	60
FACU species 10	x 4 =	40
UPL species 10	x 5 =	50
Column Totals: 91 (A)		252 (B)

Prevalence Index = B/A = 2.77

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

No true aquatic hydric plants within the water. Water clarity poor. Muddy water conditions may inhibit plant growth.

SOIL

Sampling Point: W-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	95	7.5 4/6	5	C	P	Si-Cl	
2-17	10YR 5/2	90	7.5YR 4/6	10	C	P	Cl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

The east side of pond appeared to be a constructed berm overgrown with trees. Water clarity was poor with an obvious muddy water appearance.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 2

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Gomphidae trails were observed along the waters edge. Frogs and turtles could be seen in the pool upon arrival. Water level was down from historically higher levels.

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WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 8/1/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-12

Investigator(s): V. Weaver, A. Garnsey-Zavala Section, Township, Range: Sec. 36, T20N, R10E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.170699 Long: -96.190131 Datum: WGS84

Soil Map Unit Name: 18 - Agra-Ashport, fequently flooded complex, 0 to 12 percent slopes NWI or WWI classification: PUBHh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' Rad)			
1. *Amorpha fruticosa*	5	Y	FACW
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5' Rad)			
1. *Eleocharis compressa*	35	Y	FACW
2. *Ludwigia peploides*	30	Y	OBL
3. *Ceratophyllum demersum*	15	N	OBL
4. *Asteraceae sp.*	15	N	UPL
5. *Tripsacum dactyloides*	5	N	FAC
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	40	x 2 =	80
FAC species	5	x 3 =	15
FACU species		x 4 =	0
UPL species	15	x 5 =	75
Column Totals:	105 (A)		215 (B)

Prevalence Index = B/A = 2.05

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	90	7.5 4/6	10	C	P	Si-Cl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Shale/stone

Depth (inches): 6

Hydric Soil Present? Yes X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- X True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 2

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 8/1/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-13

Investigator(s): V. Weaver, A. Garnesy-Zavala Section, Township, Range: Sec. 36, T20N, R10E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.171170 Long: -96.190877 Datum: WGS84

Soil Map Unit Name: 40 - Norge silt loam, 5 to 8 percent slope NWI or WWI classification: PUSCx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 25' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10' Rad)			
1. *Prunus serotina*	3	Y	FACU
2. *Carya cordiformis*	3	Y	FACU
3.			
4.			
5.			
	6 = Total Cover		
Herb Stratum (Plot size: 10' Rad)			
1. *Carex pellita*	50	Y	OBL
2. *Persicaria pensylvanica*	35	Y	FACW
3. *Ambrosia trifida*	15	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	35	x 2 =	70
FAC species	15	x 3 =	45
FACU species	6	x 4 =	24
UPL species		x 5 =	0
Column Totals:	106 (A)		189 (B)

Prevalence Index = B/A = 1.78

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/1	100						Organic Layer
1-16	7.5YR 4/3	70	5YR 4/6	30	C	P, M	Cl-Lm	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: AEL Proposed Expansion City/County: Osage Sampling Date: 8/1/18

Applicant/Owner: American Environmental Landfill State: OK Sampling Point: W-14

Investigator(s): V. Weaver, A. Garnsey-Zavala Section, Township, Range: Sec. 36, T20N, R10E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-1 Lat: 36.172346 Long: -96.190646 Datum: WGS84

Soil Map Unit Name: 18 - Agra-Ashport, frequently flooded complex, 0 to 12 percent slopes NWI or WWI classification: PUBFh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 25' Rad)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10' Rad)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10' Rad)			
1. *Ludwigia peploides*	50	Y	OBL
2. *Persicaria pensylvancia*	40	Y	FACW
3. *Eleocharis compressa*	10	N	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 50	x 1 = 50
FACW species 50	x 2 = 100
FAC species _____	x 3 = 0
FACU species _____	x 4 = 0
UPL species _____	x 5 = 0
Column Totals: 100 (A)	150 (B)

Prevalence Index = B/A = 1.50

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/1	100					Org.	
1-6	10YR 3/1	85	7.5YR 4/6	15	C	P,M	Si-Cl	
6-18	10YR 3/1	95	7.5 4/6	5	C	P, M	Cl-Lm	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- X True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 3

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX D

ATTACHMENT 1

ATTACHMENT 2

Cardinal
ENGINEERING, INC.

June 12, 2003

U.S. Army Corps of Engineers
1645 South 101st East Avenue
Tulsa, OK 74128-4609

Dear Sir/Mam:

Cardinal Engineering, Inc. is in the process of completing a permit application with the Department of Environmental Quality for a municipal landfill expansion to be located in the S/2 of S/2 of the NW/4, and all of the SW/4 of Section 36. E/2 of SE/4 of the NE/4, E/2 of NE/4 of the SE/4, and N/2 of SE/4 of the SE/4 of Section 35. All in Township 20 North, Range 10 East, Osage County, Oklahoma, as shown on the enclosed U.S.G.S. topographic map.

Solid Waste Management Regulations, Oklahoma Administrative Code 252:515-5-31(b) states as follows:

> "No new solid waste site shall be located within one-half (½) mile of any area that is formally dedicated and managed for public recreation or natural preservation by a federal, state, or local government agency unless the application contains a statement from the appropriate management from the agency that the proposed site is not expected to adversely affect the recreation or natural area."

Please inform me as to whether or not the proposed site is located within one-half (½) mile of any area that is formally dedicated and managed for public recreation or natural preservation under your jurisdiction. Please also state whether or not the proposed site is expected to adversely affect the recreation or natural area.

Please address your response to my attention at the address listed below. If you have any questions please contact me at 405/842-1066. Thank you for your assistance in this matter.

Sincerely,

Patrick Riley
Environmental Scientist

enclosure

E:\pn00087\expansion\Letters\USCORPEN.WPD

FACSIMILE

Cardinal ENGINEERING, INC.

Client's Bill of Rights

Cardinal...

...will strive to provide its clients with economic solutions to environmental, engineering, and surveying challenges treating the clients' resources as we would our own.

...will seek knowledge and understanding of process and conditions using its resources, experience, and educational background to preclude, as much as possible, any additional data gathering expenses and hassles.

... is committed to working hard towards solutions that are needed and wanted by the client and deems a project complete only when the client is satisfied.

...will strive to meet its clients deadlines. Cardinal recognizes our work is normally part of a "bigger picture", and we must do our part as a member of the team.

...will diligently listen to and clearly communicate with its clients as a means of promoting respect and accomplishing tasks in an organized and deliberate manner. Cardinal affirms it cannot provide solutions or work products without first clearly understanding the client and his or her needs.

Date: 7-17-03

To: ALAN

Company: US ARMY CORP OF ENGINEER

Fax: 918-669-4306

Phone: 918-669-7618

From: PATRICK RILEY

Number of Pages: 2
(including cover)

Re: PROJECT NUMBER 13139
DETAIL OF WESTERN PROJECT BOUNDARY
LANDFILL EXPANSION, OSAGE COUNTY

Comments:

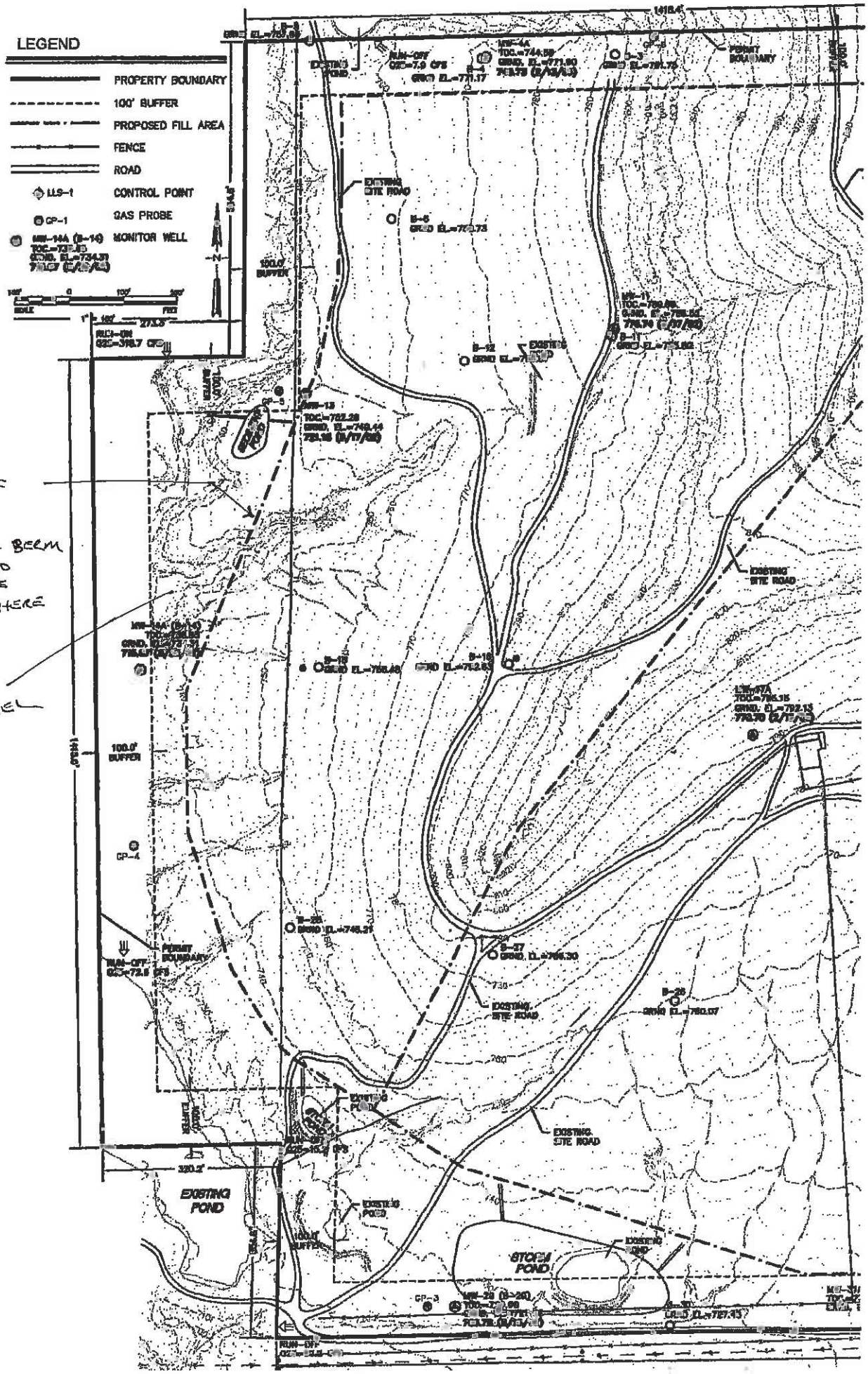
ALAN
REGARDING DEVELOPMENT ON WESTERN BOUNDARY OF PROJECT AREA, PROJECT ACTIVITIES ARE NOT ANTICIPATED TO IMPACT THE EXISTING STREAM TO THE WEST. THE PROJECT DOES CROSS A DRY CHANNEL. UNCONTAMINATED STORM WATER WILL DISCHARGE TO CREEK.

PLEASE CALL WITH ANY QUESTIONS. THANK YOU FOR YOUR HELP WITH THIS PROJECT.

This fax was sent from the following location:

☒ 6520 N Western, Ste 206	☐ 3625 W Main, Ste 106	☐ 237 N Broadway	☐ 3909½ Hawthorne Ave.
Oklahoma City, OK 73116	Norman, OK 73072	Edmond, OK 73034	Dallas, TX 75219
Phone: 405-842-1066	Phone: 405-366-8541	Phone: 405-359-3136	Phone: 214-528-0233
Fax: 405-843-4687	Fax: 405-366-8540	Fax: 405-340-5707	Fax: 214-521-8054

Visit us on the internet at www.cardinalengineers.com


LEGEND
PROPERTY BOUNDARY
100' BUFFER
PROPOSED FILL AREA
FENCE
ROAD
CONTROL POINT
GAS PROBE
MONITOR WELL
LIMIT OF DISPOSAL - RUNOFF CONTROL BERM AND ROAD WILL BE BUILT HERE
DRY CHANNEL
EXISTING SITE ROAD
EXISTING POND
STORM POND
PERMIT BOUNDARY
100.0' BUFFER

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101ST EAST AVENUE
TULSA, OKLAHOMA 74128-4609

July 23, 2003

Planning, Environmental, and Regulatory Division
Regulatory Branch

Mr. Patrick Riley
Cardinal Engineering, Inc.
6520 North Western, Suite 206
Oklahoma City, OK 73116

Dear Mr. Riley:

Please reference your facsimile of July 7, 2003, regarding the proposed expansion of an existing municipal solid waste landfill. The proposed project is located in Sections 35 and 36, Township 20 North, Range 10 East, west of Sand Springs, Osage County, Oklahoma.

The provided information does not indicate that a placement of dredged or fill material will be required, permanently or temporarily, into any "waters of the United States," including jurisdictional wetlands. Therefore, your proposal is not subject to regulation pursuant to Section 404 of the Clean Water Act, and a Department of the Army (DA) permit will not be required. Should your method of construction necessitate such a discharge, we suggest that you resubmit that portion of your project so that we may determine whether an individual DA permit will be required.

Although DA authorization is not required, this does not preclude the possibility that other Federal, State, or local permits may be required.

Your project has been assigned Identification Number 13139. Please refer to this number during future correspondence. If further assistance is required, contact Mr. Allen Ryan at 918-669-7618.

Sincerely,

Larry D. Hogue, P.E.
Chief, Planning, Environmental,
and Regulatory Division

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101ST EAST AVENUE
TULSA, OKLAHOMA 74128-4609

September 21, 2017

Regulatory Office

Wade Miller
SCS Engineers
1817 Commons Circle, Suite 1
Yukon, OK 73099

Dear Mr. Miller:

This is in reference to your letter of April 28, 2017, requesting a jurisdictional determination (JD) on property located in the Northeast 1/4, Southeast 1/4, Section 35, Township 20 North, Range 10 East, Osage County, Oklahoma. The area marked in red on the enclosed map denotes the approximate limits of the property examined under this request. We have reviewed the submitted data relative to Section 404 of the Clean Water Act (CWA).

The referenced property contains no jurisdictional wetlands. However, the unnamed tributary located within the reviewed property, as shown in blue on the enclosed map, is a regulated waterway. The placement of dredged or fill material in this waterway would require Department of the Army authorization pursuant to Section 404 CWA prior to commencement.

This JD is based solely upon available office resources, including contact with the Natural Resources Conservation Service, and not upon direct observation of the subject property. We believe this determination to be a reasonable assessment of the presence of jurisdictional waters, including wetlands, on the site subject to Section 404 of the CWA. However, this is only a preliminary determination, and as such, is not a definitive description of on-site wetlands or U.S. Army Corps of Engineers jurisdiction over the area. For an understanding of Administrative Appeal options regarding this preliminary JD, please read the enclosed information sheet.

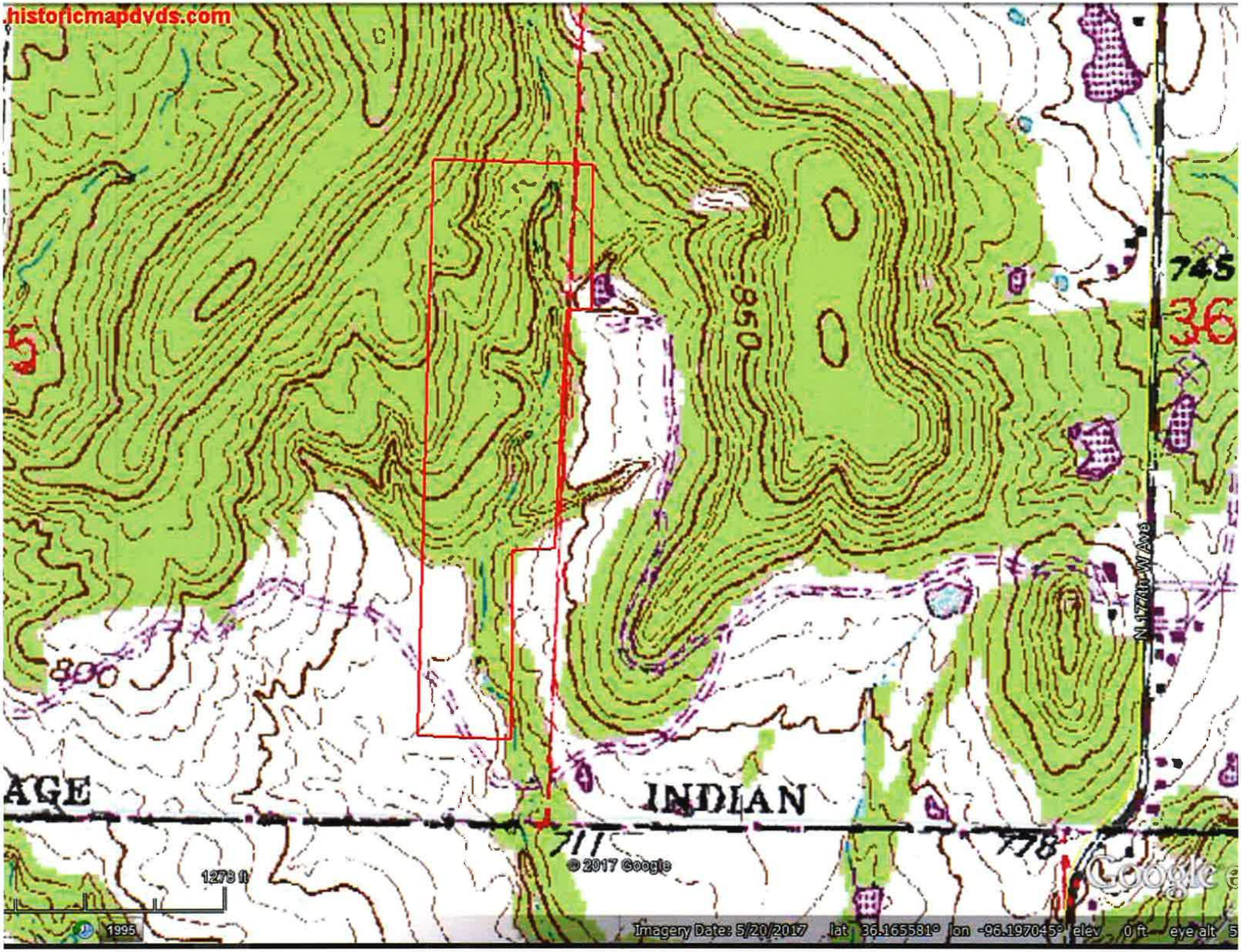
This delineation/determination has been conducted to identify the limits of the Corps CWA jurisdiction for the particular site identified in this request. This delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

Your request has been assigned Identification No. SWT-2017-339. Please refer to this number during future correspondence. If you have any questions, contact Mr. Bryan Noblitt at 918-669-4904.

Sincerely,

Andrew R. Commer
Chief, Regulatory Office

Enclosures


historicmapdvds.com
745
36
850
800
N 177th W Ave
AGE
INDIAN
711
778
© 2017 Google
1273 ft
1995
Imagery Date: 5/20/2017 lat 36.165581° lon -96.197045° elev 0 ft eye alt 5
Google

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Mr. Wade Miller, SCS Engineering	File Number: SWT-2017-339	Date: 21-Sept-2017
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/appeals.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: Mr. Bryan Noblitt Regulatory Office U.S. Army Corps Of Engineers 1645 South 101st East Avenue Tulsa, OK 74128	If you only have questions regarding the appeal process you may also contact: Mr. Elliott Carman Administrative Appeals Review Officer (CESWD-PD-O) U.S. Army Corps of Engineers 1100 Commerce Street, Suite 831 Dallas , Texas 75242-1317 469-487-7061

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office: Tulsa District | File/ORM #: SWT-2017-339 | PJD Date: Sep 21, 2017

State: OK | City/County: Osage County

Nearest Waterbody: Arkansas River

Location: TRS, LatLong or UTM: Northeast 1/4, Southeast 1/4, Section 35, Township 20 North, Range 10 East

Name/ Address of Person Requesting PJD: Wade Miller, SCS Engineers, 1817 Commons Circle, Suite 1, Yukon, OK 73099

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: 2,600 linear ft | 10 width | acres | Stream Flow: Intermittent

Wetlands: acre(s) | Cowardin Class:

Name of Any Water Bodies on the Site Identified as Section 10 Waters: Tidal: | Non-Tidal:

☑ Office (Desk) Determination
☐ Field Determination: Date of Field Trip:

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: applicant attached map
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☑ U.S. Geological Survey Hydrologic Atlas:
  - ☑ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☑ U.S. Geological Survey map(s). Cite quad name: Wekiwa, OK 1:24,000
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
- ☑ National wetlands inventory map(s). Cite name: ORM Data
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is:
- ☑ Photographs: ☑ Aerial (Name & Date): Google Earth Pro, May 20, 2017
  - ☐ Other (Name & Date):
- ☐ Previous determination(s). File no. and date of response letter:
- ☐ Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager (REQUIRED)

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is ~~impracticable~~)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office	Tulsa District	File/ORM #	SWT-2017-339	PJD Date:	Sep 21, 2017
State	OK	City/County	Osage County	Person Requestinq PJD	Wade Miller, SCS Engineering

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
1	36.164104	-96.199810	Riverine	2,600	Non-Section 10 non-wetlanc

Notes:

United States Army Corps of Engineers

404 Individual Permit Application
SWT-2017-339 Mitigation Plan

American Environmental Landfill
Proposed Lateral Expansion
Sections 35 and 36, Township 20 South, Range 10 East
Osage County, Oklahoma

American Environmental Landfill
207 North 177th West Avenue
Sand Springs, Oklahoma
(918) 245-7786

SCS ENGINEERS

27216290.00 | May 1, 2020

1817 Commons Circle, Suite 1
Yukon, Oklahoma 73099
(405) 265 3960

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1.0 INTRODUCTION

SCS Engineers, on behalf of American Environmental Landfill (AEL) is working with the Oklahoma Department of Environmental Quality (ODEQ) to permit a proposed landfill expansion to AEL's existing solid waste landfill facility. Unavoidable impacts to waters of the United States (WOTUS) were identified and a 404 permit request was completed. The unavoidable impacts are to 4,517 feet of a natural ephemeral channel (S-1) that traverses through the proposed landfill expansion area. These unavoidable impacts require offsetting mitigation, which this mitigation plan addresses. The on-site mitigation area is located within the northeast corner of land owned by AEL. Mitigation construction and management will be restricted to this mitigation area. The mitigation project area is identified in Drawing 2 in relation to AEL's property boundary.

1.1 PREREQUISITE TO DISCUSSION OF MITIGATOIN

In the 404 Individual Permit Application SWT-2017-339, avoidance and minimization alternatives were discussed and reviewed in the SWT-2017-339 application document. Ultimately, onsite mitigation was identified as the best option in order to minimize environmental impacts and costs associated with relocating the existing operations. This mitigation plan was developed to address the fundamental objective of compensatory mitigation to offset the unavoidable impacts identified in the SWT-2017-339 permit application.

1.2 METHOD OF COMPENSATION

Mitigation options approved by the USACE by preference include the use of mitigation banks, in-lieu-fees, and permittee-responsible. AEL has opted to go with the permittee-responsible mitigation to keep mitigation near the area of unavoidable impacts. At the beginning of the permit request, no in-lieu-fee providers were active in the Osage or Tulsa Counties. The Deep Fork Mitigation Bank in Lincoln County is available, but the distance to this bank would increase necessary credits due to the distance from the original impacts. After discussions with the USACE, the Corps agreed to accept a permittee-responsible mitigation. This is in line with USACE watershed management practices and is more economical for AEL while still meeting the necessary mitigation.

A combination of constructed channel and preservation of existing features will provide compensation of 4,517 feet of lost S-1 ephemeral stream function. The proposed constructed ephemeral channel will restore a majority of S-1's ephemeral function. Although the length of constructed channel does not equal the length of channel lost (3,298 to 4,517 feet), the constructed channel will increase the area of instream ephemeral habitat by an additional 0.77 acres (0.502 to 0.67 acres) (Table 1). To supplement for the lack of the full length of S-1 channel, an out-of-kind preservation of existing features of 1.129 acres of ponds and wetlands will be part of the mitigation package. Based on mitigation credit calculations, approximately 0.93 more acres will be created than the compensation requirement. The lost aquatic needs from S-1 is primarily conveyance of runoff water. The mitigation channel will provide the same need of conveying water from the upper reaches of the watershed to a tributary to the Arkansas River. The destination of the runoff will be the same waterbody as the S-1 natural channel. Increased aquatic function, beyond the ephemeral channel can be found in both the deep waters of the ponds and the emergent wetlands. In addition to the constructed mitigation channels, 1,283 feet of riparian corridor will be planted. This mitigation plan exceeds the minimum compensatory requirement.

Table 1. Compensatory Migitagatoin Credits Table.

	Length (feet) - (in-kind)	Area (acres) - (out-of-kind)		
Expected Impacts to existing streams	4517	0.502		
Proposed Mitigation	In-Kind mitigation	Out-of-Kind mitigation**	Adjusted Credits for Mitigation	Mitigation Ratio
Beginning Credits needed			- 5417 ft	
Constructed ephemeral channels (feet)	3298 ft/0.334 ac		- 1219 ft -1.119 ac^	1:1
Constructed ephemeral channel (acres)*		0.345 ac	- 0.77 ac	1:3.18
West Pond***		0.31 ac	- 0.46 ac	1:3.18
East Pond***		1.11 ac	0.65 ac	1:3.18
North Wetland^*		0.14 ac	0.79 ac	1:3.18
South Wetland^*		0.14 ac	0.93 ac	1:3.18
Totals Compensation Credits	3290 ft	2.045 ac		

^ 1.065 acres is the out-of-kind mitigation credits generated from the Mitigation Credit Multiplier Table.

* The constructed stream channel's area (acreage) is greater than the impacted streams area.

** The calculated ratio for out-of-kind mitigation is 6.02 based on the results from the Mitigation Credit Calculation table.

*** The constructed channel established a connectivity with WOTUS

^* The constructed channel's proximity to the wetland establishes a significant nexus.

1.3 OBJECTIVE

1.3.1 DESCRIPTION OF RESOURCE AND METHOD OF COMPENSATION

This mitigation plan is for proposed impacts to 4,517 feet of the S-1 stream channel that was identified in the permit application as an ephemeral channel located within the proposed expansion area. This mitigation plan includes the construction of an ephemeral stream (MS-1), and the preservation of existing ponds and wetlands currently not identified as WOTUS features. MS-1 will begin at a spillway located at the southeast corner of a farm pond (P-1) and traverse east to join a second pond (P-2). A smaller constructed ephemeral channel (MS-2) will connect P-2 via a spillway from the southeast

corner south to a 2.93 acre pond (W-1) **(Appendix A, Drawing 5)**. W-1 is a pond that has been identified as a WOTUS feature in an approved jurisdictional determination. A constructed ephemeral channel (MS-3) will direct overflow from the south end of W-1 to a culvert under N. 177th W Avenue. By establishing a connection with this WOTUS feature to the combination of constructed channels and previously identified non-jurisdictional ponds and wetlands, a jurisdictional nexus will be created.

The MS-1 channel will be similar in structure and function as the impacted natural ephemeral stream channel S-1 channel. S-1's natural stream characteristics include a defined bed and bank with a channel width that ranged from 2.97 to 7.2 feet and an average depth of 6 to 8 inches at the OHWM. The impacts to S-1 include the loss of 4,517 linear feet and an area of 0.502 acres. The bed material of S-1 is consistent with the surrounding parent material. S-1's streambed did not exhibit hydric soil characteristics based on three sample locations. Hydrophilic plants were not dominant within the streambed or shoreline throughout the S-1's existing channel reach. The northern portion of the S-1 channel was located under a forested riparian canopy. As part of the proposed mitigation plan, a constructed channel that has a streambed consistent with parent material and within the local forested/grassland plant community would establish similar ephemeral stream conditions as the current S-1 channel. A portion of the mitigation channel will include a riparian mitigation area.

MS-1 will have a stream reach of 2,721 linear feet with a channel surface area of 0.62 acres. The MS-2 channel will include an additional 199 linear feet and a channel surface area of 0.05 acres. MS-3 channel will include an additional 378 linear feet and a channel surface of 0.09 acres. These channels will be constructed to help offset the 4,517 linear and 0.501 acres that will be impacted in the S-1 reach. To help reach the required mitigation compensation, an additional 1.85 acres of existing wetlands and ponds will be included in the mitigation design via preservation. Two ponds (P-1 and P-2) will have a direct connection with the MS-1 stream channel. MS-1 will be connected to P-1 via a spillway that will release water from a 0.31 acre pond. Flow from P-1 and the surrounding watershed will discharge into P-2 **(Appendix A, Drawing 6).** Overflow from P-2 into the constructed MS-2 channel will then flow into W-1, the identified WOTUS feature. W-1 will discharge into MS-3 that will flow to existing culverts under N. 177th West Avenue. The MS-1 ephemeral stream channel will be constructed within 100 feet of two existing emergent wetland features identified as EW-1 and EW-2. EW-1 is located on the north side of MS-1 and along the western half of the channel. EW-2 is located along the south side of MS-1 and toward the eastern end of the channel. The construction of the MS-1 channel will allow the outside bend of the meandering channel to release water during high flows and sheet flow over to the EW-1 and EW-2 wetlands. Both wetlands will also be able to drain back toward MS-1 as the channel flows recede. The proximity of these wetlands will have a significant nexus, which establishes a jurisdictional status. By combining the construction of ephemeral channels with the preservation of existing hydric features and connecting them to an identified jurisdictional WOTUS, the mitigation plan complies with the objective of a compensatory mitigation plan as identified by the USACE. Incorporating the protection of existing functional wetlands into the mitigation plan allows for a more successful mitigation and provides better protection to WOTUS. The MS-1, MS-2 and MS-3 channels will provide a drainage way that allows runoff to converge with downstream WOTUS features, which will establish a connectivity. All historic upstream drainage (9.2 acre watershed) into P-1 will remain unchanged while the historic discharge of P-1 into S-1 will be rerouted through MS-1. The final destination of the watershed runoff remains the same, the Arkansas River. On-site functions will be similar between S-1 and MS-1 with temporary flows that discharge through native soil channels located in a combination of rock outcroppings and lowland Agra-Ashport soils.

1.3.2 MITIGATION RESOURCE AQUATIC FUNCTION

The aquatic function of S-1 ephemeral channel was to convey watershed runoff to the Arkansas River. The MS-1, MS-2, and MS3 ephemeral channels will convey watershed runoff to the Arkansas River through Shell Creek, east of the mitigation area. Forested riparian vegetation will provide canopy cover for the ephemeral MS-1 channel to compensate for lost riparian cover of 1,283 linear feet along S-1. All functions of S-1 will be part of MS-1's, MS-2's and MS-3's design and function including headwater capture area and discharge into the Arkansas River.

Aquatic function for S-1 exists in short flow durations consistent with ephemeral flows that are typically associated with runoff events from precipitation. During several site visits completed by SCS field staff, no visible water was observed with the S-1 channel. Temporary or persistent niche utilization of aquatic conditions do not appear probable in the natural channel of S-1. The lack of water in S-1 indicates that the aquatic function would be limited or not available to aquatic organisms.

1.4 SITE PROTECTION INSTRUMENT

As part of the USACE requirements, the constructed mitigation channels and connected hydric features will have a deed restriction placed on them. This deed restriction will be in-perpetuity protecting these features from future development. The deed restriction will be for the identified mitigation project area (Appendix A, Drawing 6).

The mitigation area is owned by AEL. The mitigation area and structures identified within the mitigation plan will be identified in a deed restriction. This deed restriction will identify the USACE as an objective third party that will have the right to enforce mitigation site protections. The USACE will be provided the resources to request outside independent entities to complete necessary monitoring. The USACE will have the authority to enforce site protection of identified mitigation features and on maintenance of channel stability and function.

A 60-day advanced notification to the USACE will be given prior to any action taken to void or modify the instrument, management plan, or long-term protection mechanism, including transfer of title to, or establishment of any other legal claims over, the compensatory mitigation site.

A deed restriction will be approved by the USACE prior to the beginning of mitigation construction. A USACE deed restriction form will be completed and submitted for approval after the mitigation plan is approved and prior to a site specific permit being issued to AEL.

1.5 SITE SELECTION

The mitigation area is located on adjacent land and neighboring sub-watershed of HUC 111101010301 to the east (WS-1) of the S-1 watershed (WS-2). Both sub-watersheds have similar topography and soil types (Drawing 6). The origination of the MS-1 channel is P-1, the same stock pond that discharges into S-1. This mitigation area has a natural slope for drainage toward the east with a combination of forested and grassland areas that have similar vegetative communities as the S-1 watershed with a predominantly natural ecosystem. The watershed headwaters to MS-1 are identical to S-1. Recent land use between WS-1 and WS-2 has been limited to livestock management. Signs of recent land use were limited to vehicle access roads and constructed fences and pens. The operation of the AEL landfill is the biggest difference between WS-1 and WS-2 land use practices. With similar topography, soil composition, recent land use, and native plant communities, the mitigation location for MS-1 is comparable to the location and ecology of the S-1 drainage way. The option to construct a full-length mitigation channel could have been completed, but runoff into existing aquatic

features would have been diminished. It was determined that providing a series of connections with existing aquatic structures was better for the hydrological function of the site. The additional water flowing through MS-1 from the WS-2 upper reaches would not exceed the storage and flow capacities of these existing features (EW-1, EW-2 and W-1) and would provide an increase in aquatic habitat niches **(Appendix D: American Environmental Landfill Stormwater Model and Calculations)**. With similar topography, soils, biota and final destination, the mitigation location is a suitable replacement for the lost S-1 channel functions.

1.5.1 ENVIRONMENTAL CONDITIONS

The mitigation area is a combination of an upland hardwood forest with rock out crops that transition into a tallgrass/woodland lowland mosaic. The forested area is dominant along the western third of the mitigation area while the lowland mixed tallgrass prairie/woodland section is dominant along the eastern end. The mitigation channel will be constructed through the oak/hickory hardwoods that dominate the upland forests and traverse into the tallgrass/woodland lowlands. Both forested and grassland areas are comprised of a diverse native plant community. The mitigation area has no existing channels, but does have scattered isolated emergent wetlands. Fences and small structures within the mitigation area indicate that past land use included some type of livestock management.

The vegetative cover of the west diversion option was dominated by an upland hardwood forest. The east diversion option provided a mix of forested area and grassland and a combination of drainage grades. The east option had a greater chance of increased instream habitats and established a cooperative surface water exchange with two ponds. The west option provided no existing non-jurisdictional hydric features to include for preservation, while the east option provided two emergent wetlands and a pond. With a more diverse vegetative community, including both woodlands and grasslands, the east diversion option was more suitable to maximize habitat niches included for mixed riparian corridors.

1.6 BASELINE ENVIRONMENTAL INFORMATION

1.6.1 IMPACTED STREAM REACH

Both the mitigation and the impact sites are within the Northern Cross Timbers ecoregion (Woods, 2005) and are in adjacent sub-watersheds of HUC 111101010301. The impacted S-1 stream channel is an ephemeral stream that originates at the spillway of a constructed farm pond near the Subject Site's north boundary. The impacted stream is identified with three segments so as to better identify the mitigation needs. The three segments include:

- **S-1 North Stream Segment** – Currently a non-impacted section that is located along a steep sloping rocky area that is 1,283 feet long. This stream segment initially begins as a grassy spillway along the southwest corner of the pond. Within a short distance of the spillway, the channel transitions into a series of low head-cuts. This shallow channel has a mixture of vegetative and non-vegetative channel bottom. No hydric soils or dominant hydric plant communities were observed throughout the north stream segment. This segment has a woodland canopy, but the trees along the channel's edge were not facultative, facultative wet, or obligate plants. The woodland canopy did provide some shading of the dry channel.

  The Northern Stream Segment transitions from a shallow channel to a poorly defined cascading area along the steep slopes of rocky outcrops. The stream channel loses the defined bed-and-bank configuration and appears as a mix of large boulders with sporadic

debris points. The elevation change along this steep slope/boulder section is approximately a 50 foot drop over a 400 foot reach of channel. At the base of the steep slope/boulder channel, the stream channel regains a defined bed-and-bank. The south end of this segment ends in an artificial impoundment. Aside from the artificial impoundment, no surface water was seen within this channel reach, even though the area had a rain event within 24 hours of the site visit.

- S-1 Central Stream Segment – This segment has been identified by the USACE as an impacted site and is one of the primary reasons for this mitigation plan. The identified impact of placing fill within jurisdictional waters prior to acquiring approval is a violation to the Clean Water Act. AEL is in the process of applying for an after the fact permit that includes this mitigation plan. This reach is 1,300 feet long and is comprised of a channel that has been filled with soil. The location of the natural channel could not be determined due to the volume of soil placed within this segment. Based on historical aerial photos, NWI maps, and topographic maps, the channel appears to be located along the valley bottom through the middle of the soil pile.

- S-1 Southern Stream Segment – This segment is 1,934 feet long and begins at the southern end of the soil pile that was discussed in the S-1 Central Stream Segment section above. This stream segment has been incorporated into the landfill's stormwater management system. Currently, AEL's stormwater management directs runoff toward the Southern Stream Segment channel for discharge of stormwater from the property. The S-1 Southern Stream Segment had an access road, with three large culvert pipes, located in the southern quarter of this stream segment. Above the culvert pipes, increased sedimentation from runoff of non-vegetative ground was observed. No flowing water was observed within this segment, and a mixture of upland and hydric plants were observed within the channel's bed. The substrate did not exhibit hydric soil characteristics.

The combined length of the stream to be mitigated is 4,517 feet. Of the 4,517 feet, currently 1,300 is impacted with 3,217 feet that will be impacted from the permitted expansion of the AEL landfill. The full stream reach of S-1 within the Subject Site has been identified as an ephemeral stream.

1.6.2 MITIGATION STREAM REACH

The mitigation site is located within the Northern Cross Timbers ecoregion (Woods, 2005) and is in an adjacent sub-watershed of HUC 111101010301. The topography is a combination of uplands with rock outcrops and oak/hickory hardwood forest. The forested area is dominated by mature trees at the higher topographic reliefs and a combination of young and mature trees along the slopes. The understory ground cover was comprised of tallgrass prairie plant community. Numerous old vehicle paths were present near the bottom of the hill. These vehicle paths had dense herbaceous growth. As the terrain transitioned from upland forested area to open grasslands, the herbaceous community increased in density and richness. The herbaceous community was consistent with a tallgrass prairie plant community from the toe of the hillside to the eastern pond (P-2). Mixed within the lowland grasslands were tree rows and several wetlands. Two of these wetlands appeared to be constructed stock ponds that had filled in with sediment. No stream channel was observed through the mitigation reach, although shallow drainage swales and scattered isolated wetlands were observed. Fences and small structures within the mitigation area indicate that past land use included some type of livestock management.

1.7 DETERMINATION OF CREDITS

1.7.1 IN-KIND MITIGATION CREDITS

To mitigate for impacts to 4,517 linear feet of ephemeral stream, a combined approach of in-kind and out-of-kind mitigation is proposed. In-kind mitigation (at a ratio of 1:1) will include the construction of 3,298 linear feet of new stream channel. Out-of-kind mitigation for the remaining 1,597 linear feet will include preservation of existing wetlands and ponds. A total of 1.128 acres of required out-of-kind mitigation will be included as part of the mitigation compensation (Table 2).

1.7.2 OUT-OF-KIND MITIGATION CREDITS

The following summary is how SCS derived the proposed out-of-kind mitigation credits using guidance from the USACE's Department of the Army Regulatory Program "Aquatic Resource Mitigation and Monitoring Guidelines" (2004). The three stream segments previously discussed were divided so as to address existing and proposed impacts. These segment current impact statuses are:

- S-1 Northern Stream Segment –not impacted
- S-1 Central Stream Segment – impacted
- S-1 Southern Stream Segment – not impacted

Each of these segments were assessed individually to determine the mitigation credits that the USACE will require. The different multipliers, that are identified in the USACE "Aquatic Resource Mitigation and Monitoring Guidelines" (2004), were considered to represent what stream conditions that currently or may have existed prior to impacts.

The remaining percentage of overall stream length, not accounted for by MS-1, was used to determine the three segments portions of the stream lengths used in the multiplier. The multiplier criteria were then used to calculate the out-of-kind mitigation ratios on the remaining 1,597-feet of stream length requiring mitigation compensation. These calculations are represented in Table 2. A total of 1.128 acres of required out-of-kind mitigation will be included as part of the mitigation compensation.

Table 2. Mitigation credit calculations based on USACE mitigation guidelines

Multiplier	S-1 Northern Stream Segment	S-1 Central Stream Segment	S-1 Southern Stream Segment	S-1 Northern Stream Segment Mitigation Value	S-1 Central Stream Segment Mitigation Value	Southern Stream Segment Mitigation Value	Total Stream Segment Mitigation Value
Stream Length (ft^2)	454	460	683	454	460	683	1597
Average width (Estimated ft) - Mitigation Value (ft^2)	3.23 ft.	4.52 ft.	6.13 ft	1464.15 ft^2	2077.498 ft^2	4189.385 ft^2	7731.033 ft^2
Calculated Acres	0	0	0	0.034 ac.	0.048 ac.	0.096 ac.	0.177 ac.
Increased distance of mitigation site from impact (10%/10miles)	0	0	0	0.034 ac.	0.048 ac.	0.096 ac.	0.177 ac.
High biological diversity of the impact site	0	0	0	0.034 ac.	0.048 ac.	0.096 ac.	0.177 ac.

Multiplier	S-1 Northern Stream Segment	S-1 Central Stream Segment	S-1 Southern Stream Segment	S-1 Northern Stream Segment Mitigation Value	S-1 Central Stream Segment Mitigation Value	Southern Stream Segment Mitigation Value	Total Stream Segment Mitigation Value
Physical or structural complexity	0.2	0.2	0.2	0.040 ac.	0.057 ac.	0.115 ac.	0.213 ac.
Ecological uniqueness -	0	0	0	0.040 ac.	0.057 ac.	0.115 ac.	0.213 ac.
Length of time necessary to achieve functional maturity (.2/year)	0.6	0.6	0.6	0.064 ac.	0.092 ac.	0.185 ac.	0.340 ac.
Situating the mitigation site in a different watershed	0	0	0	0.064 ac.	0.092 ac.	0.185 ac.	0.340 ac.
Situating the mitigation site in a different ecoregion	0	0	0	0.064 ac.	0.092 ac.	0.185 ac.	0.340 ac.
Increased lag time between impact and mitigation completion (.2/year)	0	0.6	0.6	0.064 ac.	0.147 ac.	0.295 ac.	0.506 ac.
Reasonable anticipated negative and detrimental influences	0	0	0	0.064 ac.	0.147 ac.	0.295 ac.	0.506 ac.
Inconsistency in the source of hydrology	0	0	0	0.064 ac.	0.147 ac.	0.295 ac.	0.506 ac.
Pre-existing easements, existing utilities, prior land uses	0	0	0	0.064 ac.	0.147 ac.	0.295 ac.	0.506 ac.
Necessity of significant soil amendment or soil replacement	0	0	0	0.064 ac.	0.147 ac.	0.295 ac.	0.506 ac.
Reliance on enhancement, or creation strategies as opposed to restoration	0.2	0.2	0.2	0.077 ac.	0.176 ac.	0.355 ac.	0.607 ac.
Reliance on preservation strategy as mitigation	0	0	0	0.077 ac.	0.176 ac.	0.355 ac.	0.608 ac.
Use of out-of-kind mitigation for incurred impacts	1	1	1	0.155 ac.	0.352 ac.	0.709 ac.	1.216 ac.
Mitigation requirements reduced by 10% if the mitigation is constructed at least 6 months prior to	0.1	0	0.1	0.139 ac.	0.352 ac.	0.638 ac.	1.129 ac.

Multiplier	S-1 Northern Stream Segment	S-1 Central Stream Segment	S-1 Southern Stream Segment	S-1 Northern Stream Segment Mitigation Value	S-1 Central Stream Segment Mitigation Value	Southern Stream Segment Mitigation Value	Total Stream Segment Mitigation Value
authorized project impacts							
Calculated required wetland acres				**0.139** ac.	**0.352** ac.	**0.638** ac.	**1.129** ac.

1.7.3 PRE-MULTIPLIER CONDITIONS

1.7.3.1 STREAM LENGTH

The stream lengths were obtained from data collected for the Preliminary Wetland Jurisdictional Determination Report SWT-2017-339, (2018) that has been submitted to the USACE. To determine average channel widths, data was collected on two on-site streams. Stream width averages were collected to better characterize the natural stream morphology within the Subject Site. Average widths for each of the three channel segments were calculated so that an area value could be determined. With the length and area of each stream segment, a ratio of stream segment to total length was established. These calculations were completed to determine the remaining area of each segment. A multiplier was then given to each stream segment areas to determine the total out-of-kind mitigation credits needed to meet the compensation requirements.

1.7.3.2 S-1 NORTHERN STREAM SEGMENT

The Northern Stream Segment includes the start of the S-1 channel below a constructed farm pond. The farm pond was not identified as jurisdictional, but visually was identified as a source of water during and for short periods after runoff events. This northern stream channel is approximately 1,283 linear feet with an average width of 3.2 feet and ends at the beginning of the impacted S-1 Central Stream Segment. This segment is 28.4 percent of the total impacted reach. MS-1 will not compensate for 454 feet of this stream segment. This 454 feet is used in the mitigation calculator to determine out-of-kind requirements.

1.7.3.3 S-1 CENTRAL STREAM SEGMENT

The central stream channel was identified by the USACE as an impacted WOTUS. This stream section has had fill placed within the jurisdictional boundary but does not have a current USACE permit. Therefore this non-authorized stream impairment requires mitigation for compliance and is a reason for this permit request. The USACE has identified that a total of 1,300 feet of stream length has been impacted for this section. Due to the existing condition and the inability to measure stream channel width, the estimated width was calculated as described below in section 6.5.2 – Stream Width. For this this segment, the calculated average width of 4.5 feet. This segment is 28.8 percent of the total impacted reach. MS-1 will not mitigate for 460 feet of this segment. This 460 feet is used in the mitigation calculator to determine out-of-kind requirements.

1.7.3.4 S-1 SOUTHERN STREAM REACH

The southern stream channel begins at the end of the 1,300 feet of central stream channel and ends at the southern AEL property boundary. This segment is approximately 1934 feet long and has a calculated average width of 6.1 feet. This segment is 42.8 percent of the total impacted reach. The proposed constructed channel will not mitigate for 683 feet of this steam segment. This 683 feet is used in the mitigation calculator to determine out-of-kind requirements.

1.7.4 STREAM WIDTH

The stream channel widths are based on measurements taken from two channels in the Subject Site. The channels that were the focus of this data collection are identified as S-1 and S-2 **(Preliminary Wetland Jurisdictional Determination Report SWT 2017-339)**. Both are identified by the USACE as jurisdictional. Both channels are ephemeral with a defined bed-and-bank. Channel widths measurement locations are identified as transects. Each transect includes three measured widths approximately ten feet apart that were averaged. Transects were spaced approximately three-hundred feet apart. All linear measurements were on stream lengths. Meanders/bends were included in stream lengths to account for total stream length. Transect averaged widths were analyzed with a linear slope regression (best fit). Linear slope regression values were used to determine the increase in channel width over stream length. Both channels were analyzed independently. An R-squared regression analysis for each best-fit line was done to assess the variance within the data set.

Four transects were collected for the S-1 channel and eleven transects for the S-2 channel. The S-1 channel had a slope of 0.35*(transect) while the S-2 channel slope was 0.3*(transect). These calculated slopes indicate that for every transect (300 feet in stream length), the channel width increases by 0.35 and 0.3 feet respectively. The R-squared regression analysis was 0.18 and 0.62 respectively. Because the R-square regression analysis for the S-2 channel is closer to 1.0 and has a better representation of the stream channel's average width over length, SCS used the S-2 channels slope with the S-1 channel starting width to calculate total area for mitigation of the three previously discussed S-1 stream channel areas.

1.7.5 CALCULATED AREA IMPACT

For the remaining portion of the three identified stream segments not compensated by the proposed constructed channel, a channel area was calculated using the remaining stream length and average width **(Table 3)**. These calculated areas are the starting values for calculating the requirements to meet the compensation of out-of-kind mitigation outlined by the USACE. The area values are used to convert linear stream impacts into mitigation acres. The starting impacted area value equals a 1:1 compensation ratio **(Table 3)**. The initial calculated areas include:

- North Stream Segment – 0.034 acres
- S-1 Central Stream Segment – 0.048 acres
- Southern Stream Segment – 0.096 acres

With these initial starting mitigation area values, the "Tulsa District Mitigation and Monitoring Guidelines" identified a number of factors that influence the ratio of mitigation required against losses. These factors (multipliers) were evaluated for each stream segment independently.

Table 3. Calculated area and fill of S-1 stream segments.

	S-1 North Stream Segment proposed impacts	S-1 Central Stream Segment existing impacts	S-1 Southern Stream Segment proposed impacts	Total Stream Segment impacts
Stream channel linear (feet)	1283	1300	1934	4517
Average channel width (feet)	3.225	4.516	6.134	
Stream channel (acres)	0.095	0.135	0.272	0.502
Average depth of OHWM (feet)	0.5	0.667	0.667	

1.7.6 MULTIPLIERS

Each multiplier is discussed with the suggested increase of compensation credits. The suggested increases are SCS's opinion. These multiplier values are a starting point for working with the USACE to determine final compensation costs for proposed and existing impacts to MS-1.

1.7.6.1 Increased Distance of Mitigation Site from Impact Site

An increase of 10 percent for each increment of 10 miles of distance. The proposed mitigation site is located in the northeast corner of the Subject Site and all mitigation will be located less than one mile from the impacted channel. With the mitigation site less than one mile, an increase in mitigation ratio of zero for each stream segment is suggested.

1.7.6.2 High Biological Diversity of the Impact Site

The stream channel has been identified as an ephemeral channel. The surrounding and in channel habitat does not support a highly diverse aquatic or terrestrial biota. Benthic and fish species would not be expected to exist in the impacted ephemeral streams. The stream channel traverses through a hardwood forest with sparse understory ground cover. In the North Stream Segment no observed pools were present and hydric plant communities were not dominant. The Central and Southern Stream Segments were filled or heavily modified and biological diversity conditions could not be assessed specific to these reaches. Based on the northern stream channel and the S-2 reach that was used to measure channel widths, the expected aquatic biological diversity would likely be consistent with the Northern Stream Segment. The channel bottom had non-hydric vegetation in several locations and areas that consisted of a shallow incised earthen channel. The existing undisturbed channel does not fit the narrative of a "high biological diversity" habitat. A multiplier increase of zero percent is suggested for this factor.

1.7.6.3 Physical or Structural Complexity of the Impact Site

This factor considers the in channel and riparian characteristics. A defined bed and bank have inherent complexities that allow for a stable channel system, which was observed within the Northern Stream Segment. A stable stream channel, regardless of existing flows, indicates that a level of hydrological complexity exists to maintain the bed and bank configuration. A multiplier increase of twenty percent for ephemeral stream structural complexity was identified for the Northern, Central, and Southern Stream Segments.

1.7.6.4 Ecological Uniqueness of the Impact Site

This factor considers the rarity of the in channel habitat. The instream aquatic habitat in the S-1 ephemeral stream is limited to periods of flow. Based on observations of the on-site stream channels, the S-1 stream channel does not retain temporary pools or flows beyond short durations. Establishment of aquatic fauna is unlikely to occur and would provide no ecological uniqueness to aquatic dependent biota. A multiplier increase of zero percent is suggested for this factor.

1.7.6.5 Length of Time Necessary to Achieve Functional Maturity

The time for a created feature to reach mature functionality is dependent on several environmental variables that make it difficult to accurately estimate a mature state. The proposed mitigation options include creating a new stream channel segment and to enhance and establish a connectivity with existing non-jurisdictional wetlands. It is estimated that the ephemeral streams will reach functional maturity quicker than modifications to intermittent or perennial streams. This is based on the existing ephemeral channel's current function as primarily a runoff conduit with no persistent aquatic complexes. To replicate this existing channel, a new channel will be proposed that conveys runoff through a new defined bed and bank channel that will over time develop an OHWM. Mature functionality should be obtained within three years after channel construction. As part of the channel re-alignment, this new channel location will be routed near existing non-jurisdictional wetlands establishing a connectivity/significant nexus. The modifications to establish a surface flow connectivity, during high flows, with wetlands would require time to re-establish mature functionality. Because these are not created wetlands, but modifications to existing wetlands, the time for them to recover is expected to be shorter. A conservative estimate on obtaining functional maturity for the constructed stream channel is three years, which has a multiplier of 60 percent.

1.7.6.6 Situating the Mitigation Site in a Different Watershed

Both the S-1 channel and mitigation project area are located in the same HUC 12 watershed (111101010301). With the proposed mitigation within the same HUC 12 and therefor the same HUC 8 watershed. A multiplier of zero percent for being in a different watershed is suggested.

1.7.6.7 Situating the Mitigation Site in a Different Ecoregion

Both the S-1 channel and proposed mitigation area are located in the Environmental Protection Agency (EPA) Level 4 Cross Timbers Ecoregion. With both the impacted and mitigation locations within the same ecoregion, a multiplier of zero percent for situating the mitigation site in a different ecoregion is suggested.

1.7.6.8 Increased Time Lag Between Construction Impact and Completion of Mitigation Activities

This factor considers when mitigation begins and links this time to when impacts will occur to the natural system. For the Northern Stream Segment, mitigation is expected to be in place and reach functional maturity prior to proposed impacts. For this segment, a multiplier increase of zero percent is suggested because of no loss of stream function over time. The S-1 Central Stream Segment has been identified as impacted and requires mandatory mitigation. The proposed mitigation will take time to construct and additional time to allow for functional maturity, functional maturity for this ephemeral stream is expected to be obtained within three years. The Central Stream Channel multiplier is equal to 20 percent per year for three years for a total multiplier of 60 percent. The Southern Stream Segment is proposed to be modified to address existing storm water quality concerns. Modifications to this segment will be made shortly after an approved USACE permit is obtained. This means that mitigation may not be established prior to impacts. As with the S-1 Central Stream Segment, it is expected to take three years for mitigation measures to reach functional maturity for a multiplier of 60 percent for the Southern Stream Segment.

1.7.6.9 Reasonably Anticipated Negative and Detrimental Influences on New Mitigation Sites

The proposed mitigation site is on private property and development in the area is anticipated to be little to none after completion of mitigation construction. A deed of restriction will be established for the mitigation project area. Little to no impacts to the new mitigation features are expected to occur. With little to no known impacts, the mitigation area will be maintained in a natural state. A multiplier of zero percent is given for this factor.

1.7.6.10 Inconsistency in the Source of Hydrology for the Mitigation Site

The mitigation project area will receive the runoff from the same headwaters area as the S-1 channel. The diversion of the upper watershed to the MS-1 channel is expected to retain hydrological consistence as the original (S-1) headwater stream. The mitigation channel will convey runoff for short durations similar to the natural channel. With redirecting runoff flows from WS-2 to the east WS-1, inconsistency in flows and durations, compared to S-1, should not occur within the constructed channel. Typical runoff from the surrounding land will be similar in WS-1 as in WS-2 in that the surrounding land will drain into the MS-1 channel increasing flow levels as the stream traverses down the topography **(Appendix A, Drawing 6)**. The remaining runoff within WS-2 will be collected within AEL's stormwater collection system. This stormwater will be treated prior to being discharged into the S-1 natural channel south of the Subject Site. A multiplier of zero percent is suggested for this factor.

1.7.6.11 Pre-Existing Easements, Existing Utilities, Prior Land Uses

In the design and construction of the mitigation features, easements and existing utilities will be avoided. Land will remain in non-developmental and non-agriculture use. The mitigation project area should not be affected by the constraints identified by these factors. A multiplier of zero percent is suggested for these factors.

1.7.6.12 Necessity of Significant Soil Amendment or Soil Replacement to Make Mitigation Site Viable

The S-1 bed and bank is consistent with the surrounding parent soil indicating that hydric soil conditions are not present in the natural ephemeral channel. Establishing a similar channel in the mitigation area would not require amendment to the soil. Plant communities within the mitigation area are similar to the plant community around the natural channel. The natural channel does not have a dominant hydric plant community along the banks or within the channel. The mitigation area will be constructed in similar parent material with similar hydric characteristics that are not expected to have dominant hydric plants and hydric soils. Incorporating the existing wetlands with minimal disturbances into a connectivity/significant nexus should not require soil augmentation. A multiplier of zero percent is suggested for this factor based on existing conditions within both the natural and neighboring mitigation watersheds.

1.7.6.13 Reliance on Enhancement, or Creation Strategies as Opposed to Restoration

Because the mitigation project area is likely to incorporate different mitigation strategies including creating an ephemeral channel and preservation of existing functional ponds and wetlands, a combined effect was evaluated. The construction of a new ephemeral channel will increase the multiplier. Because the stream channel will mimic an ephemeral stream with relatively low flow frequencies, the channel stability during short durations of flow would require a relatively simple design plan. This plan would not need to address instream aquatic habitat due to expected short flow durations (as indicated by the lack of hydric soils in the natural channel) that does not allow aquatic organisms to establish a niche utilization. By incorporating the existing wetland features that currently are not identified as jurisdictional, into the riparian corridor the ability to provide functional wetlands minimizes the challenges of enhancement or creation. The inclusion of two wetlands and two ponds into the wetland mitigation plan provides protection of existing hydric features. Protecting existing functional hydric features improves the mitigation system functionality while preserving previously non-jurisdictional features. Incorporating previously non-jurisdictional wetlands into a jurisdictional status, the requirement to provide viable and functional mitigation WOTUS features should be satisfied. A multiplier of 20 percent is suggested for this factor based on the minimal stream channel design and establishing a jurisdictional designation on currently non-jurisdictional features.

1.7.6.14 Reliance on Preservation Strategy as Mitigation.

The proposed mitigation strategy does not rely on the preservation of already identified WOTUS features solely within the mitigation area. Mitigation compensation will incorporate existing functional wetlands and ponds to improve mitigation success. The completed mitigation will result in new jurisdictional identified hydric features that will have USACE oversite in the future. A multiplier of zero percent for the use of preservation of four existing non-jurisdictional features that will become jurisdictional through this mitigation process.

1.7.6.15 Use of Out-of-Kind Mitigation for Incurred Impacts.

The use of out-of-kind mitigation is limited to the remainder of the S-1 stream reach that was not matched with the proposed MS-1 stream. A multiplier of 100 percent for out-of-kind mitigation is required by the USACE.

1.7.6.16 Mitigation requirement reduction.

Mitigation for the Northern Stream Segment should be constructed and reach maturity prior to impacts on the natural channel. The Southern Stream Segment is expected to be modified after the mitigation plan is in place. The S-1 Central Stream Segment is impacted prior to mitigation construction completion. For the Northern and Sothern Stream Segments, a -10 percent reduction is suggested. For the S-1 Central Stream Segments a multiplier of zero percent is suggested for mitigation reduction.

1.7.7 MITIGATION CREDITS

Impacts to WOTUS include a total of 4,517 linear feet of stream channel, which is equal to 0.502 acres (Table 1). Per a conversation with USACE project manager Marcus Ware on May 17, 2019, it was discussed with SCS that the USACE would accept a 1:1 mitigation ratio for created ephemeral stream channel length as part of the mitigation. The remaining unmatched impacted stream reach is 1595 feet. SCS completed a mitigation calculator to determine the out-of-kind acres needed to satisfy the required mitigation compensation (Table 1). The table indicated that 1.128 constructed/protected hydric features would meet the required out-of-kind compensation.

The out-of-kind compensation is based on acres instead of linear feet. The creation or protection of 1.128 acres of hydric features/wetlands/ponds in addition to the 2,920 linear feet of MS-1 channel is the combined mitigation compensation that SCS understands needs to be established for the lost aquatic function of 4,517 (feet) stream length.

To meet this obligation, SCS has designed a mitigation plan that includes the creation of a new ephemeral channel that is connected to or has a significant nexus with existing ponds and wetlands. These existing ponds and wetlands were identified as non-jurisdictional by the USACE. The excess channel area of the constructed channel, that was not used as part of the 1:1 mitigation match, will be used as part of the out-of-kind compensation match. The off-setting costs for the required mitigation are represented in Table 1.

The constructed channel will connect two ponds and will be located within 100 feet of existing emergent wetlands. The combination of ponds, constructed channels, and wetlands will all drain into an existing WOTUS pond. With the creation of these relationships and the connection with a WOTUS feature, this mitigation plan establishes a jurisdictional connection for all the associated features. This mitigation plan is combining the creation of a stream channel with the preservation of existing water bodies to meet the mitigation compensation requirements. When completed the mitigation will include 3298 feet of constructed ephemeral stream connecting a 0.31 ac. (P-1) pond to a 1.11 ac. pond (P-2) (Drawing 6). A shorter 199 feet constructed ephemeral stream will connect the 1.11 ac. pond (P-2) to an existing WOTUS pond (W-1). A third constructed ephemeral stream will (MS-3) connect the 1.11 ac. pond (W-1) to the existing downstream channel at the culvert under N 177th West Avnue. Along the longer stream channel, the new channel will be constructed near two existing wetlands (EA-1 and EW-2) so that when high flows exceed the channel capacity, the overflow will enter these existing 0.15 ac. wetlands. Like-wise, if the wetland's capacities are exceeded, excess water will drain back toward the MS-1 channel. When completed, this mitigation plan will include 3,298 linear feet of new stream channel that connects 1.42 ac. of ponds and establish a significant nexus with 0.30 ac. of established emergent wetlands.

The incorporation of existing hydric features into the mitigation design will improve the function and vitality of the mitigation project area beyond the minimum standard that is required. Additionally these viable features will improve the function of the mitigation project area sooner than just constructing mitigation features.

This mitigation plan will include a deed restriction on future development of the mitigation project area. This deed restriction will identify the jurisdictional authority on the mitigation project area and identify the mitigation features within this area.

1.8 MITIGATION WORK PLAN

1.8.1 WORK DESCRIPTION

The mitigation area is located across two sub-watersheds of HUC 111101010301 as represented in **Drawing 5.** The mitigation area includes:

- Three constructed channels (MS-1, MS-2, and MS) with a combined length of 3,298 linear feet.
- A riparian corridor that is a minimum of 1,283 feet long. The width of the riparian corridor is approximately 50 feet wide on both sides of the constructed channel. Existing riparian areas around P-1 and EW-2 are included in the riparian mitigation.
- Two existing ponds (P-1 and P-2) are included as part of the mitigation features
- Two existing emergent wetlands (EW-1 and EW-2) are included as part of the mitigation features.

A channel will be constructed starting from the southeast corner of the P-1 pond and traverse east through several meandering bends and connect with P-2 establishing 1,721 linear feet of mitigation channel **(Drawing 8).** The location of the channel will be in close proximity to two existing emergent wetlands that will have limited surface flow exchanges. The channel construction should be completed within 90 days. Herbaceous reseeding will be completed within 60 days of channel construction. Native seed planting will be restricted to December 1, through June 15, temporary ground cover will be planted after June 15 through November 30 followed with native seeding targeted from March through April. Tree planting will be restricted to mid-February and mid April.

Work will include the excavation of rock and soil to establish a flat bottomed channel that will be approximately 10 feet wide with banks that will have a 3:1 slope to existing grade **(Drawing 13)**. The channel bottom and banks will consist of native soils. In reaches where rock check dams will be installed, aggregate having a D_{50} of 9 inches or greater will be used **(Drawings 9 through 13)**. These check dams will be keyed into the channel bottom a minimum of 1 foot. Check dams will also be keyed into the banks with a minimum of 3 feet along straight sections and inside bends and a minimum of 5 feet into banks along outside bends. The top of check dams will have an elevation equal to the downstream toe of the preceding check dam or at an elevation where the channel gradient exceeds a 2% slope **(Drawing 13)**.

Material that is excavated and not used in the channel construction will be removed from site and used as daily cover at the AEL facility. No additional materials need to be brought on site.

The mitigation design drawings are located in **Appendix A – AEL Proposed Expansion Mitigation Design** and includes:

- Existing and proposed elevations **(Drawings 2, 5, 7-13)**
- Permit areas that include the mitigation and proposed landfill expansion areas **(Drawing 5)**
- Pre-construction soil profiles **(Drawing 6)**
- Source of hydrology for proposed site **(Drawing 2, 4-5, 7-12)**
- Area of watershed feeding proposed site **(Drawing 7)**

A Stormwater Pollution Prevention Plan (SWPP) that AEL functions under for daily operations will cover construction activities. This SWPP can be provided upon request.

1.8.2 WATER SOURCE

The water source for the mitigation area are represented in **Drawing 7**'s catchment hydrology. Flow volumes and velocities are included in the stormwater calculation **(Appendix D, American Environmental Landfill Stormwater Model and Calculations)**.

1.8.3 RIPARIAN VEGETATIVE PLANTING

Areas that were disturbed during channel construction will be re-established with a tallgrass native seed mix recomended for the region. Trees planted within the forested riparian corridors will be species native to the Cross Timbers region of Oklahoma. The details of these vegetation restorations are discussed in more detail below.

1.8.3.1 LIST OF PROPOSED PLANT SPECIES

The National Resource Conservation Service (NRCS) and the Osage County Extension office recommendations for the region have identified plant species for reseeding purposes in the area around AEL. This recommended plant community is consistent with a mixed grass prairie with dominant grasses that include:

- Big Bluestem (*Andropogon gerardii)*
- Little Bluestem (*Schizachyrium scoparium*)
- Indiangrass (*Sorghastrum nutans*)
- Switchgrass (*Panicum virgatum*)
- Buffalograss (*bouteloua dactyloides*)

The seed mix should include between five and 10 percent forbs consistent with a tallgrass prairie plant community. Seed mixes will maximize species richness suitable for the region.

The Subject Site is located in the EPA Ecoregion of Oklahoma's Cross Timbers (Woods, 20015). The Cross Timbers include the Post oak – Blackjack Forest and include several predominant oak and hickory tree species. These tree species include:

- Post Oak (*Quercus stellate*)
- Blackjack Oak (*Q. marilandica*)
- Black Oak (*Q. velutina*)
- Chinkapin Oak (*Q. prinoides*)
- Black Hickory (*Carya texana*)
- Bitternut Hickory (*C. cordiformis*)

Riparian mitigation tree planting will include bare root saplings of the fore mentioned species.

1.8.3.2 Planting Guidelines

The construction of an ephemeral stream channel will not require hydric plants. Reseeding will be limited to upland herbaceous plants. No live plantings will be used for the herbaceous stratum in the mitigation area. All herbaceous post construction plantings will utilize a tallgrass seed mix.

Bare root saplings will be planted for the riparian corridor mitigation. Tree saplings will include locally native species with a preference for hardwoods of the oak and hickory family. Bare root saplings will include the fore mentioned tree species for the region.

In addition to planting saplings, natural propagation of the existing tree community will be encouraged by protecting existing trees near the mitigation corridor. Mature trees adjacent to the mitigation corridor will be marked prior to construction so that heavy equipment operators can try and avoid harming these trees during construction. By preserving mature trees, natural propagation of the riparian mitigation will supplement the initial tree planting.

1.8.3.3 Herbaceous Stratum Planting Scheme

The post construction planting scheme will be consistent with the NRCS "Vegetation Guidelines for DEQ Land Restoration Program (2015). Native seed planting will be completed between December 1 and June 15. If possible, seeding will be targeted for March through April for optimum germination. If planting will be after June 15 and before December 1, a temporary cover crop will be established to minimize wind and water erosion.

Excess excavated material will be transported into the active landfill area for use as daily cover alleviating the need for supplemental conditioning of topsoil within the mitigation area. Areas that have been traversed with heavy equipment will be disked prior to planting to loosen compacted soils. Final seedbed preparation will be completed to a friable, smooth, firm seedbed without competitive cover.

Planting methods will use grass drill equipment with double disc or coulter furrow openers with depth band and press wheels, cultipacker, or drag chains. Seed will be planted between 1/8 and ½ inches deep.

Mulching will be either with 100% wood fiber or with a 70/30 percent wood to recycled paper mix. Hydromulching or bio-matting will be used on steep slopes where necessary to provide an initial erosional control prior to seed emergence.

Seed quantities will be based on percent of full rate application per acre. No seed mix will have greater than 40 percent of seed for a single grass species. Forbes and legumes will comprise between 5 and 10 percent of the total seed mix.

1.8.3.4 Tree Stratum Planting Scheme

A riparian mitigation corridor will be established for a minimum of 1,283 feet of linear stream. Trees planted around ponds and wetlands will have a half credit for each foot of tree cover. Existing trees along hydric features will be considered riparian woodlands. The riparian mitigation corridor will be 50 feet wide on both sides of the constructed channel. This will make the overall riparian area 110 feet wide – including the stream channel.

Bare-root saplings will be placed 18 to 24 feet apart to allow trees to reach maturity with minimal detrimental competition while providing suitable coverage if some samplings do not reach maturity. This riparian area will also have natural re-forestation from existing trees that are outside of the mitigation corridor. The combination of re-planting and natural re-forestation will provide the mitigation with a diverse tree community. Mature trees that will exist outside of the mitigation corridor will provide supplemental shading.

A spacing of 18 feet is the minimum recommended distance for bare-root trees to be planted so as to allow for minimal competitive growth of young trees. A spacing of 25 feet is approximately half the width of many mature oak species. With expectation that some of the planted trees will not reach maturity, the anticipated losses should have a minimal impact on the riparian mitigation corridor obtaining a full canopy of 70 percent. At maturity, the riparian mitigation corridor would need a

minimum of four trees for each hundred foot reach of channel to obtain 70 percent or greater canopy cover. The planting of 4 to 6 times more trees, than what is needed at maturity, provides an adequate compensation for tree loss at maturity.

Post construction tree planting in the riparian mitigation area will include bare root trees. Planting bare root trees should be completed from mid-February through April. Bare root trees should be soaked in water 3 to 6 hours before planting. Trees will be planted to a depth that covers all roots. No soil amendments, fertilizers, potting soils or chemical are used with bare root trees. Soil is firmly packed around roots and each tree is watered at the time they are planted. Additional watering may be needed for the first year after planting.

Bare root trees will be planted after herbaceous cover has been drilled. Mulching of the herbaceous layer will try and minimize material around base of planted sapling. If planting trees after mulching occurs, then the mulch will be moved away from each tree trunk after planting.

Trees will be mixed and placement will be random with the following guidelines:

- No tree will be planted in the constructed channel bottom, along the slope of the constructed channel or within 5 feet of the top of the channel.
- Trees will be planted with a minimum of 18 feet separation and no more than 30 feet.
- Trees will be planted on both sides of the channel out to 50 feet.
- Tree species should be mixed so that a more natural community of trees can be established.
- No tree species should be more than 20 percent of the planted trees.

Existing trees that exist within 50 feet of the constructed channel will be counted in the riparian mitigation corridor. Each tree over 20 feet will be considered a mature tree and would be equal to 5 bare root trees. Trees 10 to 20 feet will be considered equal 3 bare root trees. After mitigation construction is complete, an existing tree count, within the riparian mitigation corridor, will be conducted. After existing trees are counted and the numbers converted to bare root trees, the existing tree number will be subtracted from 3,900. If no live trees exist in the riparian mitigation corridor after construction, a total of 3,900 bare root trees will be planted.

For the first year, if rainfall is not sufficient, newly planted trees will be periodically watered. Each tree will be watered with 1 to 2 gals. Tree watering may be completed by mechanical irrigation, or spot watering. Periodic watering will be at a minimum of twice a month if rainfall in the area has not occurred for each month. Watering in the winter from beginning of December through March will not occur.

1.8.4 GRADING PLAN

The grading design and plans are represented in **Drawings 8 through 13.** An estimated 10,045 cy of cut material will be generated. From this material with the appropriate sized aggregate size, 5,175 cy will be placed in the constructed check dams throughout the channel. Constructed channel elevations are represented within **Drawings 8 through 13.** Soil erosion protection measures, as identified by the existing AEL stormwater pollution prevention plan will be implemented.

1.8.5 DISPOSAL SITE

All excess cut material and generated waste, not used within the channel's check dams, will be transported for use by AEL in on going landfill operations.

1.9 OPERATION AND MAINTENANCE

Operation of the mitigation area will resort back to an un-managed grassland/woodland/forest. Management of this area will be minimal. Maintenance of the mitigation area will be based on the results of the tri-annual monitoring. Issues that needs corrective action will be addressed on an item specific basis.

1.9.1 CHANNEL STABILITY

Channel stability after periods of flow is a priority. If, during the tri-annual monitoring and inspections, instability within the channel are identified, a corrective action plan will be established to correct/restore channel stability. These types of issues will be on an as needed bases to maintain channel continuity. Dirt work related issues will be addressed as soon as reasonably possible and at a minimum started prior to the end of the year. Examples of issues that may require corrective action include but not limited to:

- Vertical cut banks and increased incised channels greater than two times the previous years measured height
- Headcuts within the constructed channel that can incise/undercut and cause instability in check dams and pond spillways.
- Divergent channel formations which may result in channel shorting and increase flow velocities
- Channel blockages from excessive sedimentation and debris loading

1.9.2 HERBACEOUS STRATUM STABILITY

Corrective issues regarding the herbaceous stratum will be identified during the tri-annual monitoring and inspection periods. Areas that are identified as not adequately establish vegetative cover, a reseeding of these areas may be completed again. Areas that have an excessive erosion problem will be addressed by reshaping the ground surface, reseeding, and if necessary installation of erosion control structures until vegetative cover has been established.

If excessive invasive species coverage occurs, a selective eradication of invasive plants will be completed to control further expansion. Eradication options will be determined based on site specific needs of existing conditions. Eradication options may include but not limited to:

- Chemical treatments – not within identified local hydric features
    - Spot treatment of individual plants
    - Area chemical treatment of large plots dominated with invasive species
    - Treatment of cut stems
- Physical removal
    - Cut and removal of plant material
    - Disking and re-seeding

Chemical(s) that may be used will be specific for the identified invasive species

The mitigation area is not required to be mowed. Efforts to enhance and improve vegetative recovery within the mitigation area may be implemented as long as those practices do not contribute to deleterious surface water conditions or impairments to the vegetative recovery. The boundary property outside of the mitigation footprint is not included in the mitigation oversight.

1.9.3 TREE STRATUM STABILITY

Forested riparian stability corrective actions will include the replanting of bare root samplings in areas of the riparian mitigation area that have lost trees below a standard of 9 bare root samples per 100 feet of riparian corridor. For these areas, bare root trees will be replanted to bring the area back to the initial standard of 15 bare-root trees or equivalent for each 100-foot riparian reach. Each side of the stream channel will be treated independently for tree replanting purposes.

1.10 PERFORMANCE STANDARDS/MONITORING

Monitoring of the mitigation area will be completed on a tri-annual basis. The monitoring events will be during the growing season so as to accurately identify living plants. Monitoring will be completed by professionals that have been instructed on the monitoring objective and procedures. Monitoring staff will have a basic understanding of herbaceous and tree cover assessment with linear transects. Staff will also be able to identify different channel features and potential instability problems. As part of the monitoring program, the identification of maintenance issues is included. After field data is collected and analyzed, results of data findings will be included in a report to the USACE. End of year reports will be provided to the USACE 31st of the following year.

1.10.1 CONSTRUCTED CHANNEL MONITORING AND REPORTING

Channel assessment will include a full length inspection for structural integrity. Channel monitoring will be for ten years. If during this period three years of stability has been documented and verified by the USACE, AEL may petition the USCOE to reduce channel monitoring frequency or stop monitoring completely. The channel stability determination will be based on the channel's width and bed stability. Channel widths and sinuosity are expected to fluctuate over time as flows adjust and then re-establish stable channel conditions. The channel's average width and depth are expected to remain relatively consistent over time. Upon construction completion, the constructed channel will have ten transect locations established. These ten locations will be permanent and used for the subsequent monitoring events. A "T" post, GPS point, or other reference marker will be established during the initial assessment. Post construction measurements will be the baseline used to compare the channel stability for the next year's assessment. Channel width stability will exist when there is less than a ten percent increase in average channel width for the overall stream reach. Channel bed stability will exist when there is less than a one foot change in transect cut/fill channel-bottom height average for the overall channel reach.

Channel monitoring will be conducted during the same time that vegetative cover assessments are completed. Therefore channel stability assessments will be conducted three times a year. Each year's channel measurements will be compiled and compared to the previous year's measurements. The first year after construction will be compared to the post construction channel conditions. Channel stability will be established when three consecutive years show assessment values that are within the previously discussed stable standards. When data from three consecutive years indicate that the channel width is stable, a request to reduce or stop mitigation monitoring may be made to the USACE. If the USACE agrees that channel width stability has been established, then this monitoring may be stopped sooner than ten years.

Channel widths will be measured at the OHWM/toe of slope that denotes the edge of the channel bottom (toe of slope). Transect will be in the same locations as the initial post construction measurement. Each transect will include three width measurements that are spaced approximately ten feet apart. For consistency the three measurements will be completed so that:

- the first measurement will be approximately 10 feet up stream of transect marker
- The second measurement will be at the transect marker
- The third measurement will be approximately ten feet downstream of the transect marker.

Each transect's three measured widths will be averaged to determine the transect's average width. Transect average widths will be compiled to determine the average width for the overall channel reach. The yearly channel reach average widths will be compiled for the yearly width average. Yearly width averages will be compared to the following year's yearly averages to determine stream width stability. A stream channel width will be declared stable when the overall stream reach is less than ten percent wider than the previous year. When three consecutive years show less than a ten percent increase in stream channel width from the previous years the channel will be determined stable and may be removed from the remaining portion of the monitoring period with USACE consensus.

Channel depths will be measured at the same ten transects that widths were measured. Transects will be established perpendicular to the channel. A single transect line will be set up with a taut string/tape set across the top of the banks. The string/tape will be at ground level. Channel measurements will begin on the left OHWM/toe of slope and continue to the right OWHM/toe of slope. Each transect will include five measurements that will include:

- Left edge
- Left center
- Center
- Right center
- Right edge

Below is an example of a field sheet that may be used for stream channel monitoring.

Constructed Stream Channel Stability Monitoring Sheet
AEL Mitigation Project Area
Set Transect Locations

Year _____ Sample event 1st_____ 2nd_____ 3rd_____

	Channel Width				Channel Depth					
Transect	Upstream Width	Center Width	Downstream Width	Average Width	Left Edge	Left Center	Center	Right Center	Right Edge	Average Depth
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

Stream Length Averages

Thalaweg Depth

Transect	Depth	Distance from Left Edge	Average Width
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Depth to top of Water

Left Edge	Left Center	Center	Right Center	Right Edge	Average Depth

Stream Length Averages

Each depth transect will average the five transect depths to determine an average transect depth. The transect average depths will be averaged to determine the overall streams reach average depth. The tri-annual average stream reach depths will be averaged to determine the yearly stream reach average depth. The yearly stream average depth will be compared to the previous and following years to determine channel depth stability. When data from three consecutive years indicated that the channel depth is stable, a request to stop mitigation monitoring may be made to the USACE. If the USACE agrees that channel depth stability has been established, them this monitoring may be stopped sooner than ten years.

Part of the channel reach assessment is the identification of unstable areas. These areas will be documented. Unstable areas are defined as locations of possible channel failures that include but are not limited to:

- Vertical cut banks and increased incised channels greater than two times the previous years measured height
- Headcuts within the constructed channel that can incise/undercut and cause instability in check dams and pond spillways.
- Divergent channel formations which may result in channel shorting and increase flow velocities
- Channel blockages from excessive sedimentation and debris loading

Individual unstable areas will be corrected as soon as reasonably possible to reduce the continued degradation of the channel. AEL will be responsible to address identified issues. Depending on the severity of the issue, AEL will use whatever means are necessary to repair/correct the channel instability while minimizing impacts to mitigated vegetative cover. Spot reseeding of heavily impacted mitigation areas may be done after channel repairs are complete. All reseeding will be in accordance to previously discussed planting guidelines.

1.10.2 HERBACEOUS COVER MONITORING AND REPORTING

Assessment of vegetative cover will determine percent of coverage and invasive species in post construction re-seeded areas. Monitoring will be for ten years or until vegetative cover is established with a minimum of seventy percent coverage after a minimum of three years. Vegetative cover will be determined using linear transects during the growing season. Tri-annual monitoring will be completed between April and October. The second and third tri-annual monitoring event will be no sooner than thirty days after previous tri-annual assessments. Ten, 50-foot transects well be established randomly throughout the re-seeded area. Each transect will be established by determining a random starting point and then a random direction. A 50-foot measuring tape will be placed on the ground and herbaceous ground cover will be measured along the tape. Below is an example of the vegetative cover field sheet that may be used. In areas that have greater than 50 percent tree canopy cover, transects will be re-established away from dense tree canopy areas. Canopy cover will be determined using a densiometer at the center of the transect line.

The maintenance and monitoring plan will include a tri-annual inspection of the mitigation project area. Inspections will include assessments of reseeded cover, channel bed and bank stability, and tree survival and canopy cover. These assessments will be for ten years. However, if herbaceous cover and/or channel stability are demonstrated to be stable after three years, then the length of monitoring may be reduced with USACE concurrence. Tree survival monitoring will be for a minimum of five years with demonstrated survival/recruitment. Review of the existing ponds and wetlands shall be limited to evaluating if unexpected impacts have occurred as a result of establishing a connectivity of these features with the constructed channel. No review of functionality for wetland features will be completed because these features are all currently functional.

Vegetative Cover Monitoring Sheet
AEL Mitigation Project Area
50' Random Transects

Year_____ Sample event 1st_____ 2nd_____ 3rd_____

	Transects (percent or 10ths of feet)									
Segment (Ft)	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
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39										
40										
41										
42										
43										
44										
45										
46										
47										
48										
49										
50										

Ground cover will be measured along linear transects to determine percent coverage. Coverage will be identified as vegetative cover of the herbaceous stratum. Invasive specie's cover will be identified during ground-cover measurements. Invasive species will also constitute no more than ten percent of the re-seeded area. Inspections will continue for ten years or until coverage goals are obtained. Each year's monitoring events will be included in the annual coverage averages. If the annual compiled coverage is seventy percent or greater, the standard for vegetative re-establishment will be met. Monitoring may stop if the USACE concurs.

If re-seeding goals are not obtained for proper coverage within ten years, a reseeding of the mitigation area may be completed again if concurrence with the USACE determine it necessary. Additional monitoring will continue on a yearly basis until vegetative stability is achieved.

If excessive invasive species coverage occurs, a selective eradication of invasive plants will be completed to control further expansion. Eradication options will be determined based on site specific needs of existing conditions. Eradication options may include but not limited to:

- Chemical treatments – not within identified local hydric features
    - Spot treatment of individual plants
    - Area chemical treatment of large plots dominated with invasive species
    - Treatment of cut stems
- Physical removal
    - Cut and removal of plant material
    - Disking and re-seeding

Chemical(s) that may be used will be specific for the identified invasive species

The mitigation area is not required to be mowed, but during the monitoring period the area may be mowed as part of the general management of the boundary property. Efforts to enhance and improve vegetative recovery within the mitigation area may be implemented as long as those practices do not contribute to deleterious surface water conditions or impairments to the vegetative recovery. The boundary property outside of the mitigation footprint is not included in the mitigation oversight.

1.10.3 RIPARIAN TREE COVER MONITORING AND REPORTING

Riparian tree mitigation will assess the persistence of viable trees within the constructed channel's riparian corridors. A riparian corridor is a 50-foot wide forested section along one bank of the channel. Two riparian corridors comprise a stream reach. Initially trees will be planted with an average coverage rate of 30 bare-root trees for each 100-foot reach of stream channel or 15 bare-root trees per riparian corridor. The mitigation tree density is based off the minimum and average spacing of 18 and 25 feet respectively. Mature oak tree canopy widths can be over 50 feet in diameter. Four mature oaks or hickory trees would provide the shading necessary to replace the lost riparian cover of S-1. The initial planting scheme provides a bare-root tree density that is almost 4 times the needed compensation. This scheme accounts for expected moderate losses of trees that will not reach maturity.

Each tri-annual assessments will include a tree count along three 200-foot transects. A 200-foot transect will be located entirely on one side of the channel reach and fully within the riparian mitigation area. The transect will be walked and all living trees, either planted or naturally occurring, will be counted regardless of height. Each riparian corridor will have at least one transect completed. In addition to number of trees, canopy cover along each transect will be taken at five evenly spaced locations. Canopy cover will be measured using a densiometer. Canopy values will be averaged to determine percent canopy cover.

A sub-transect of 100 feet of the 200 feet transect will include tree height measurements. This sub-transect will begin within the first hundred feet at a random location. All trees that are within this section will have their heights measured using a clinometer. Tree species will be recorded along with their height. All trees 10 feet or less will have their height recorded as "10 feet or less".

Three 100 feet transects will be established within the center of the constructed channel and a canopy cover measurement will be conducted using a densiometer at five evenly spaced locations along each transect. Canopy values will be averaged to determine percent coverage.

Standards for tree monitoring will include maintaining a percentage of live trees within a 100-foot stream reach at a ratio of 18 individual or greater of bare-root trees. As time passes, the number of live trees will decline, but the average tree height will increase. The primary reason for the restoration of a forested riparian corridor is to provide shade protection to the constructed channel. A goal of 70 percent canopy cover for the constructed channel will provide adequate shade protection.

Over the years, the number of trees will naturally be reduced while canopy cover will remain relatively consistent. As younger tree numbers decline, more mature tree numbers should increase. For this reason, trees with heights between 10 and 20 feet will be equal to three bare-root trees. Trees that are taller than 20 feet will be considered mature and are equal to five bare-root trees. A baseline density of 30 bare-root trees for every 100 feet of mitigation channel or 15 bare-root trees for each 100 feet of riparian corridor will be established after construction is complete. Establishing this density will be accomplished by planting bare-root trees. A loss of more than 20 percent of baseline density will denote a decline in riparian woodland recovery. If after three years, more than 40 percent (6 individuals per 100 feet of riparian corridor) of the baseline density has occurred, then replanting bare-root trees in areas of lowest densities may be completed to restore baseline densities.

Riparian re-establishment will be met when:

- the annual loss in tree density is less than 20 percent
- greater than 50 percent of the remaining trees are taller than 10 feet
- canopy cover is 70 percent or greater

If sometime after five years the above goals have been met, then the standard for a restored riparian corridor will have been met and continual monitoring may cease with USACE consent. Below is an example of the riparian mitigation field sheet that may be used.

Riparian Mitigation Field Sheet Page 1 or_____

Staff_____ Date_____

Transect #	Transect Starting Point	Bank L	Bank R

200 ft. Transect Species	# of Trees 0-50 ft.	# of Trees 50 -100 ft.	# of Trees 100-150 ft.	# of Trees 150-200 ft.		Canopy Cover (200 ft.)	Canopy Cover Channel (100 ft.)
Oaks					0		
Hickory					50/25		
Cedars					100/50		
Other					150/75		
Total					200/100		
					Average		

Sub-Transect Starting Point: _____

Height of clinometer (VH): _____

100 ft. Sub-Transect	Height of Tree (Percent)	Distance to Tree	Calculated Height (H/100 x D + VH)	Species
1)				
2)				
3)				
4)				
5)				
6)				
7)				
8)				
9)				
10)				
11)				
12)				
13)				
14)				
15)				
16)				
17)				
18)				
19)				
20)				
21)				
22)				
23)				

1.10.4 YEARL SUMMARY

An annual summary of monitoring results will be submitted to the USACE by March 31 of the following year. The annual summary will provide the previous years collected data on plant cover and stream channel stability. Summary details will discuss the existing conditions and if there are issues that need to be addressed or have been identified and addressed prior to the report submission. If during the field assessments, issues with stream channel stability or vegetative cover are observed that are deleterious to the success of the mitigation plan, these issues will be addressed by AEL as soon as reasonably possible. Any issues addressed during the monitoring year will be included in the annual summary and will include the concern and the corrective measures taken.

1.11 LONG-TERM MANAGEMENT PLAN

The mitigation area is being reserved as an undeveloped natural area by AEL. This area will not be developed or modified and will retain a natural vegetative cover. After mitigation vegetative cover and stream channel stability have been established, annual inspection of the mitigation project area will be completed for five more years with a general assessment of channel continuity and natural vegetative persistence. Mowing, grazing, and limited tree management of select areas may take place as a means of managing the land, but cultivation and removal of mitigation features will not occur. Invasive species management may be completed, as AEL deems necessary, to maintain the natural vegetative cover. If individual unstable areas within the stream channel develop due to future flow changes, these issues will be addressed on a case by case basis to maintain stream channel integrity. Channel problems that may require the use of heavy equipment will have a notice of intent letter (NOI) provided to the USACE prior to in channel work is started. The NOI will provide the purpose for the corrective measure.

Temporary alterations to the features in the mitigation area may occur in the future from regional infrastructure improvements. After infrastructure improvements are completed, the mitigation features will be restored to pre-disturbance conditions for vegetative cover and channel stability. AEL will provide NOI to the USACE regarding the type and duration of the proposed disturbance. No disturbance of the mitigation area will be permanent.

The constructed mitigation channels and connected hydric features will have a deed restriction placed on them. This deed restriction will be in-perpetuity protecting these features from future development. The deed restriction will be for the identified mitigation project area (Appendix A, Drawing 5). As part of the deed restriction, the USACE will be identified as the responsible third party with authority to force corrective actions is a situation arises after monitoring is completed. AEL will be responsible for costs associated with required corrective actions. AEL will be responsible in obtaining an outside contractor to complete the work if AEL is not able to complete the corrective work. Annual inspection costs for the mitigation area will not exceed $5,000 unless corrective action is required. Cost of corrective actions will be determined by AEL with approval of the USACE on proposed corrective actions.

1.12 ADAPTIVE MANAGEMENT PLAN

If after performance standards are achieved and natural causes alter the mitigation channel and riparian areas beyond the defined mitigation boundary, AEL will provide protection to the existing

channel configuration with similar management as described in the "Long-term Management Plan" and protect the altered channel from development. If up gradient changes to the watershed are made by outside entities and these changes alter the flow patterns through the mitigation area, these new flow patterns will not be adjusted for by AEL. Instead, the changes to the mitigation area will be considered natural impacts and alterations will be managed, as described earlier, through a natural progression.

If AEL fails to construct the proposed mitigation area, they will be responsible for an outside contractor, acquired by the USACE, to complete construction on the identified mitigation area. If the outside contractor is unable to complete construction, the financial assurance value of $128,000 will be provided to an in-lieu-fee provider for off-site mitigation.

1.13 FINANCIAL ASSURANCES

A non-revocable letter of credit, performance bond, or escrow account will be established that identifies AEL as responsible for costs to maintain the mitigation project area for future repairs and maintenance. A financial assurance value of $128,000 will be placed on the mitigation area. This assurance value is based on the initial construction cost and reseeding/tree planting. Additional changes or enhancements to the mitigation area, beyond the initial design, will need to be approved by the USACE and AEL.

Financial assurances may be phased out once the mitigation area has been determined by the USACE to be successful in accordance with its performance standards. The standards, as discussed within the performance standards/monitoring section, identify when:

- Stream channel yearly stream average depths, compared to the previous and following years, determine channel depth stability has not exceeded greater than a 10% increase in channel incision/deposition and channel width expansion. When data from three consecutive years indicates that the channel depth is stable, channel stability has been established.
- If the annual herbaceous coverage is seventy percent or greater, herbaceous cover has been re-established and the standard for vegetative re-establishment will have been met
- Standards for tree monitoring will include maintaining a percentage of live trees within a 100-foot stream reach at a ratio of 20 or greater (10 bare-root trees per 100-foot corridor) of bare-root trees.

If these standard are met, then the mitigation area will have obtained the goal of a stable and viable ephemeral stream channel with forested riparian cover and herbaceous ground cover.

2.0 REFERENCES

NRCS, July 30, 2015, Vegetation Guidelines for DEQ Land Restoration Program.

USACE, Tulsa District, October 2004, Department of the Army Regulatory Program – Aquatic Resource Mitigation and Monitoring Guidelines.

USGS Wekiwa, Okls. Quadrangle, 1958, 7.5 Minute Topographic Quadrangle

Appendix A

Drawing 1 – Cover

Drawing 2 – Site Map

Drawing 3 – Proposed Permit Area

Drawing 4 – Proposed Landfill Expansion

Drawing 5 – Proposed Mitigation Area

Drawing 6 - Existing Soil Types

Drawing 7 – Catchment Hydrology

Drawing 8 – Proposed Realignment (Overview)

Drawing 9 – Proposed Realignment (0 to 9+00)

Drawing 10 – Proposed Realignment (9+00 to 19+00)

Drawing 11 – Proposed Realignment (19+00 to 27+23)

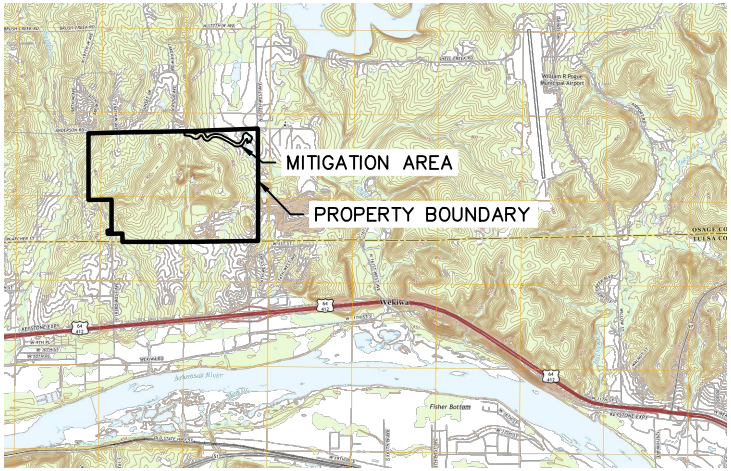
Drawing 12 – Proposed Realignment (27+23 to 29+22)

Drawing 13 – Proposed Realignment (29+22 to 33+00)

Drawing 14 - Details

AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN
JANUARY 2020

PREPARED FOR



AMERICAN ENVIRONMENTAL LANDFILL
207 N 177TH WEST AVENUE
SAND SPRINGS, OKLAHOMA

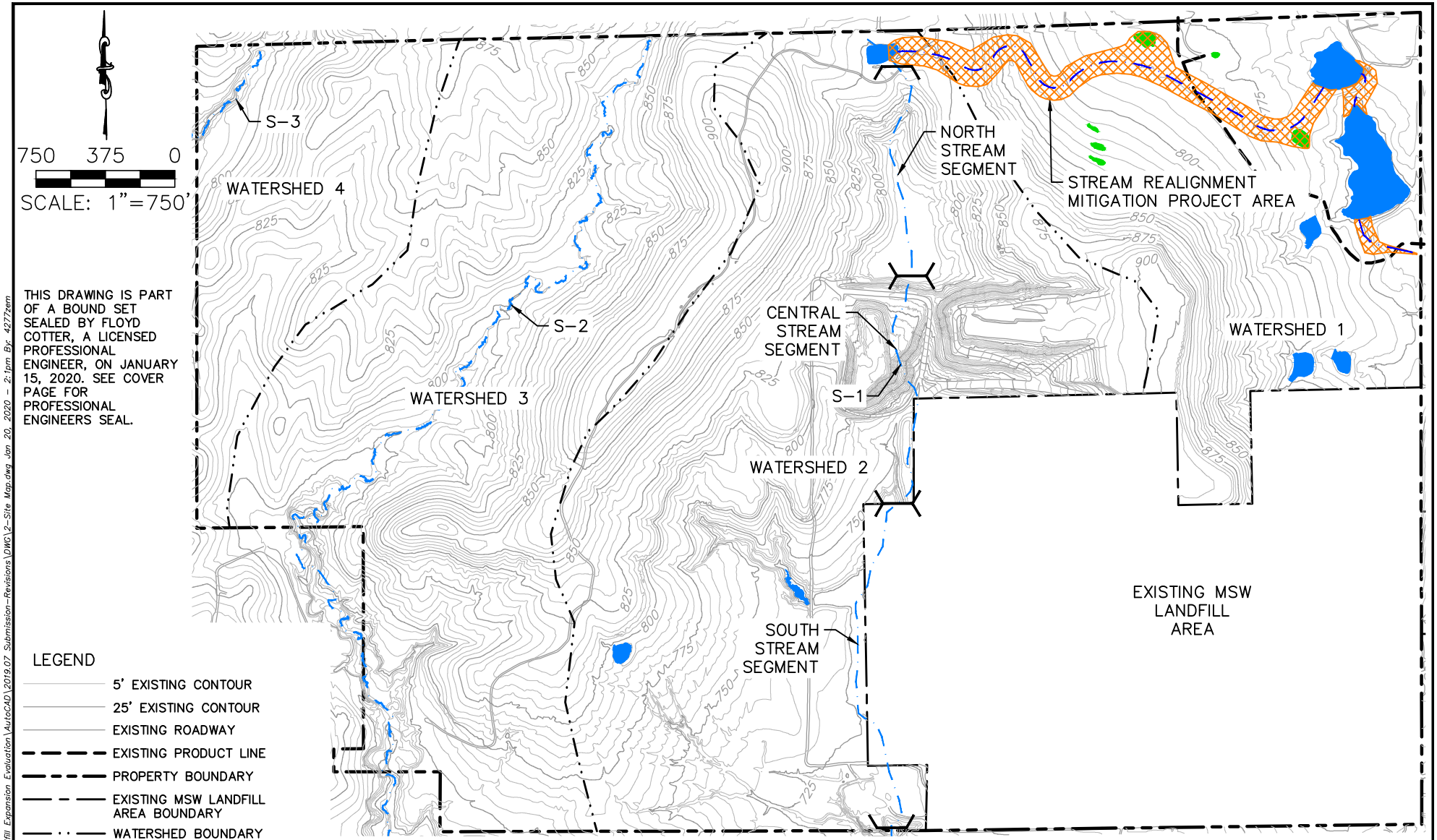
PREPARED BY

SCS ENGINEERS
8575 WEST 110TH STREET, SUITE #100
OVERLAND PARK, KANSAS 66210
PH. (913) 681-0030 FAX (913) 681-0012
PROJECT NO. 27219016.00

SHEET LIST TABLE	
SHEET NUMBER	**SHEET TITLE**
1	Cover
2	Site Map
3	Proposed Permit Area
4	Proposed Landfill Expansion
5	Proposed Mitigation Area
6	Existing Soil Types
7	Catchment Hydrology
8	Proposed Realignment (Overview)
9	Proposed Realignment (0 to 9+00)
10	Proposed Realignment (9+00 to 19+00)
11	Proposed Realignment (19+00 to 27+23)
12	Proposed Realignment (27+23 to 29+22)
13	Proposed Realignment (29+22 to 32+00)
14	Details

REGISTERED PROFESSIONAL ENGINEER
FLOYD E. COTTER
17783
OKLAHOMA
1-15-20

ENGINEERS SEAL APPLIES TO ALL DRAWINGS LISTED IN THE SHEET LIST TABLE.
ISSUE FOR PERMIT USE ONLY



THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON JANUARY 15, 2020. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

LEGEND

- 5' EXISTING CONTOUR
- 25' EXISTING CONTOUR
- EXISTING ROADWAY
- EXISTING PRODUCT LINE
- PROPERTY BOUNDARY
- EXISTING MSW LANDFILL AREA BOUNDARY
- WATERSHED BOUNDARY
- STREAM
- WETLAND
- POND
- PROPOSED MITIGATION–PROJECT AREA

NOTES:

1. EXISTING TOPOGRAPHY, PROPERTY BOUNDARY AND ROADWAYS FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
3. EXISTING STREAMS, WETLANDS, AND PONDS LOCATED USING NATIONAL WETLANDS INVENTORY MAP AND SITE VISITS PERFORMED BY SCS ENGINEERS.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

SHEET TITLE:
SITE MAP

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20
SCALE: AS SHOWN
DRAWING NO. 2 of 14

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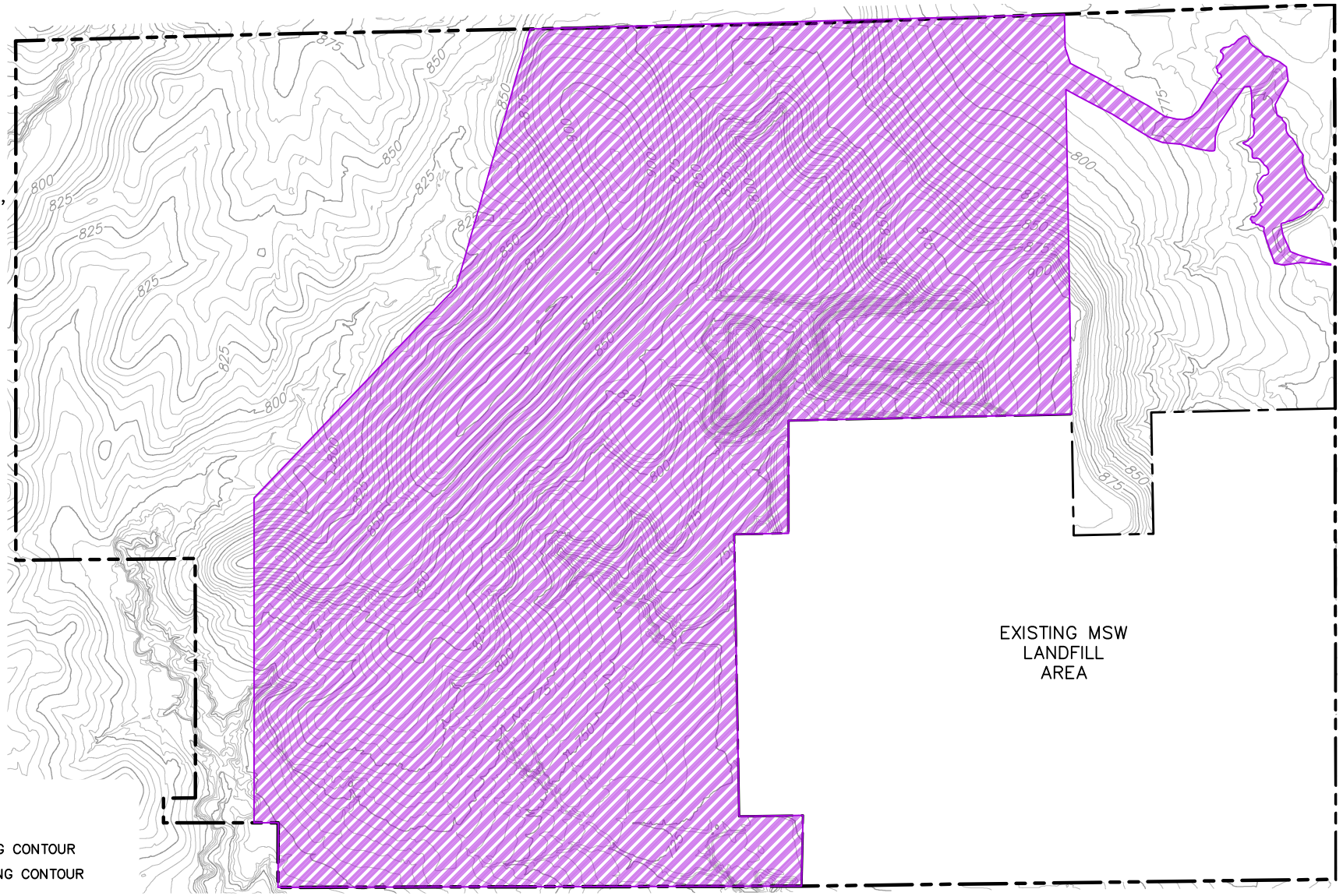

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LEGEND

- 5' EXISTING CONTOUR
- 25' EXISTING CONTOUR
- PROPERTY BOUNDARY
- EXISTING MSW LANDFILL AREA BOUNDARY
- PROPOSED PERMIT AREA

NOTES:
1. EXISTING TOPOGRAPHY, PROPERTY BOUNDARY AND ROADWAYS FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.

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27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

SHEET TITLE:
PROPOSED PERMIT AREA

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20
SCALE: AS SHOWN
DRAWING NO. 3 of 14

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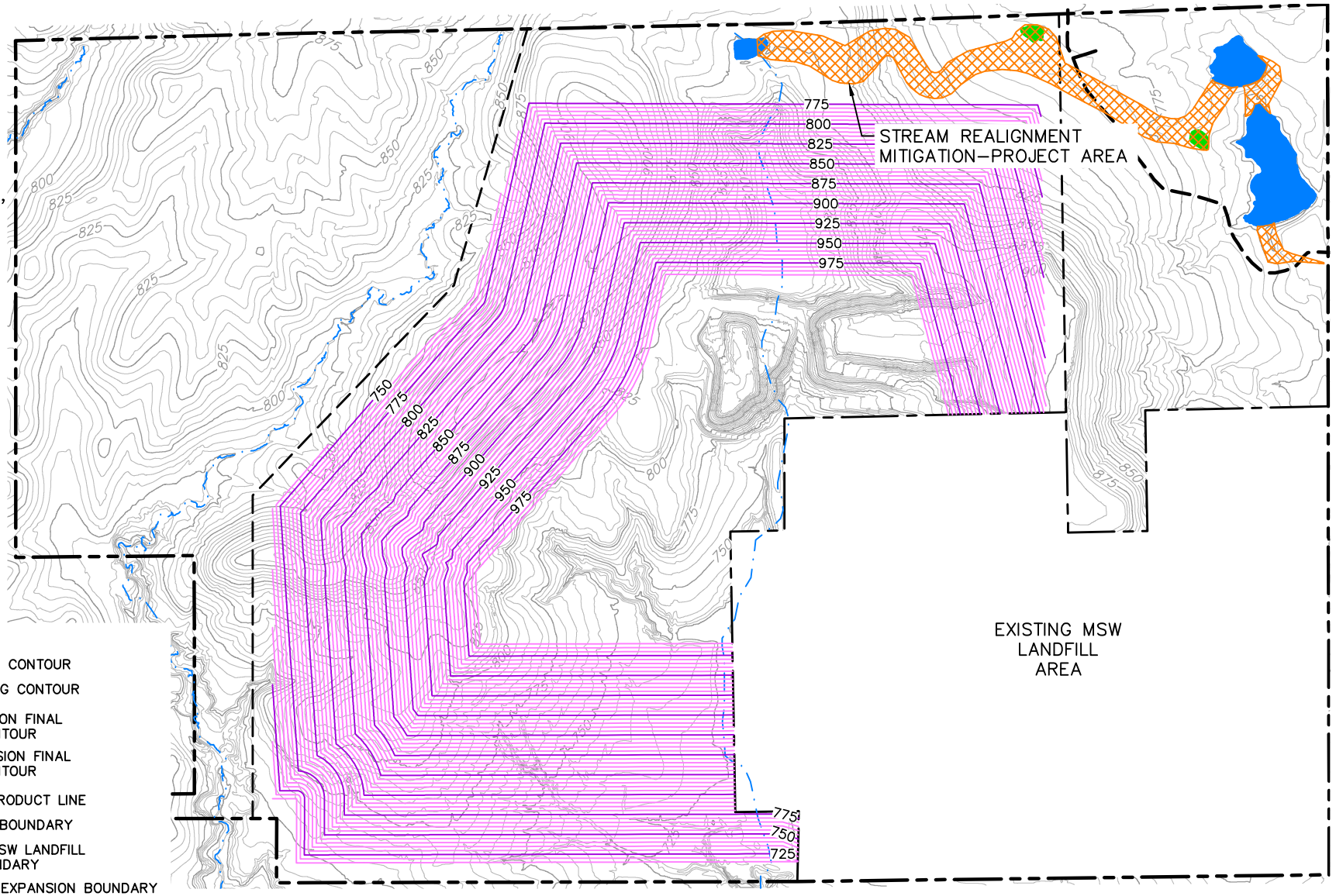

NOTES:

1. EXISTING TOPOGRAPHY, PROPERTY BOUNDARY AND ROADWAYS FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED
3. EXISTING STREAMS, WETLANDS, AND PONDS LOCATED USING NATIONAL WETLANDS INVENTORY MAP AND SITE VISITS PERFORMED BY SCS ENGINEERS.
4. FINAL COVER CONTOURS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY.

SCS ENGINEERS

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OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

CLIENT:

AMERICAN ENVIRONMENTAL LANDFILL, INC.

AMERICAN ENVIRONMENTAL LANDFILL

SAND SPRINGS, OKLAHOMA

SHEET TITLE:

PROPOSED LANDFILL EXPANSION

PROJECT TITLE:

PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20

SCALE: AS SHOWN

DRAWING NO. 4 of 14

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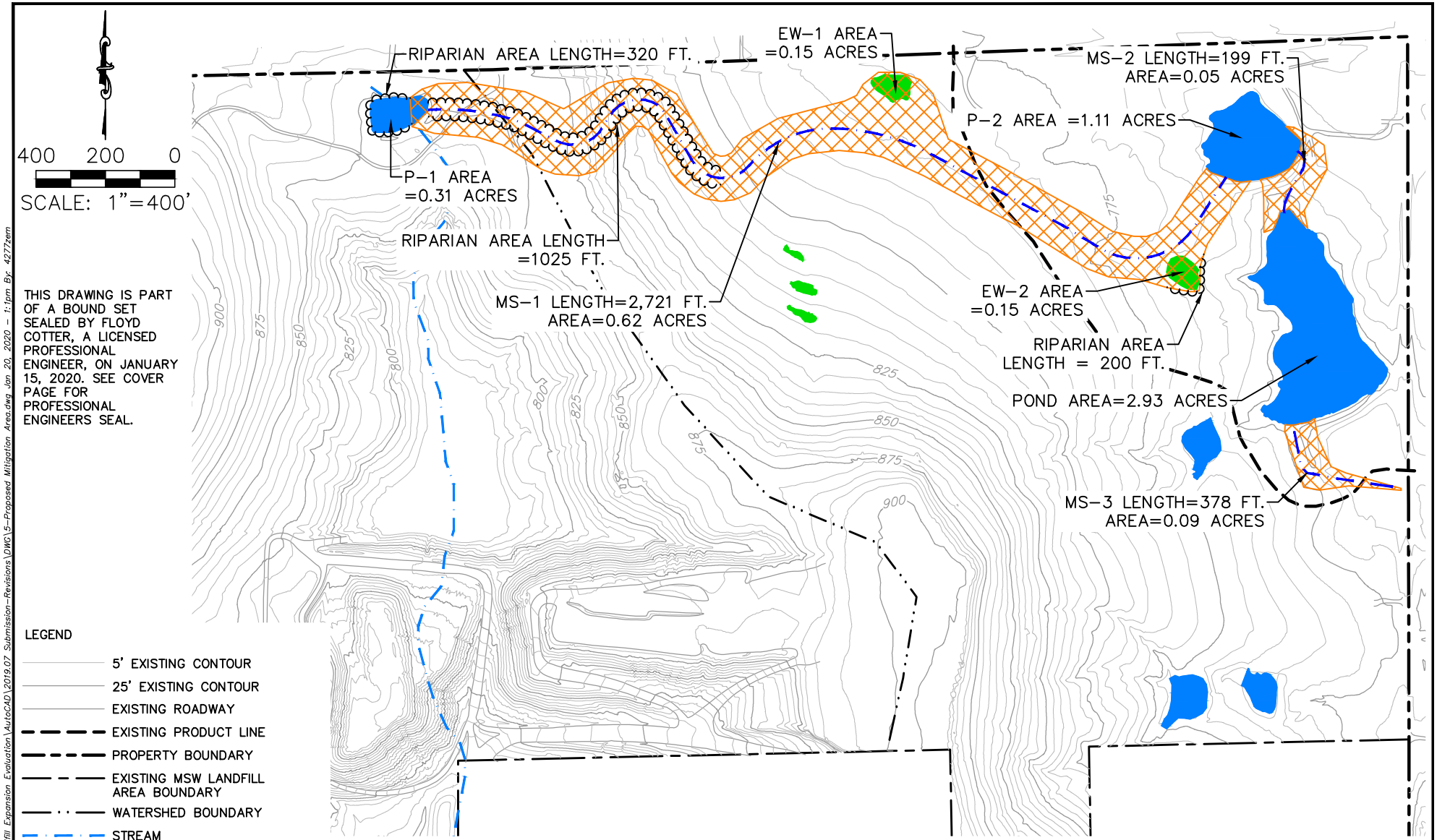

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LEGEND

- 5' EXISTING CONTOUR
- 25' EXISTING CONTOUR
- EXISTING ROADWAY
- EXISTING PRODUCT LINE
- PROPERTY BOUNDARY
- EXISTING MSW LANDFILL AREA BOUNDARY
- WATERSHED BOUNDARY
- STREAM
- RIPARIAN AREA
- WETLAND
- POND
- PROPOSED MITIGATION–PROJECT AREA

NOTES:

1. EXISTING TOPOGRAPHY, PROPERTY BOUNDARY AND ROADWAYS FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
3. EXISTING STREAMS, WETLANDS, AND PONDS LOCATED USING NATIONAL WETLANDS INVENTORY MAP AND SITE VISITS PERFORMED BY SCS ENGINEERS.

SCS ENGINEERS

8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
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PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

CLIENT:

AMERICAN ENVIRONMENTAL LANDFILL, INC.

AMERICAN ENVIRONMENTAL LANDFILL

SAND SPRINGS, OKLAHOMA

SHEET TITLE:

PROPOSED MITIGATION AREA

PROJECT TITLE:

PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20

SCALE: AS SHOWN

DRAWING NO. 5 of 14

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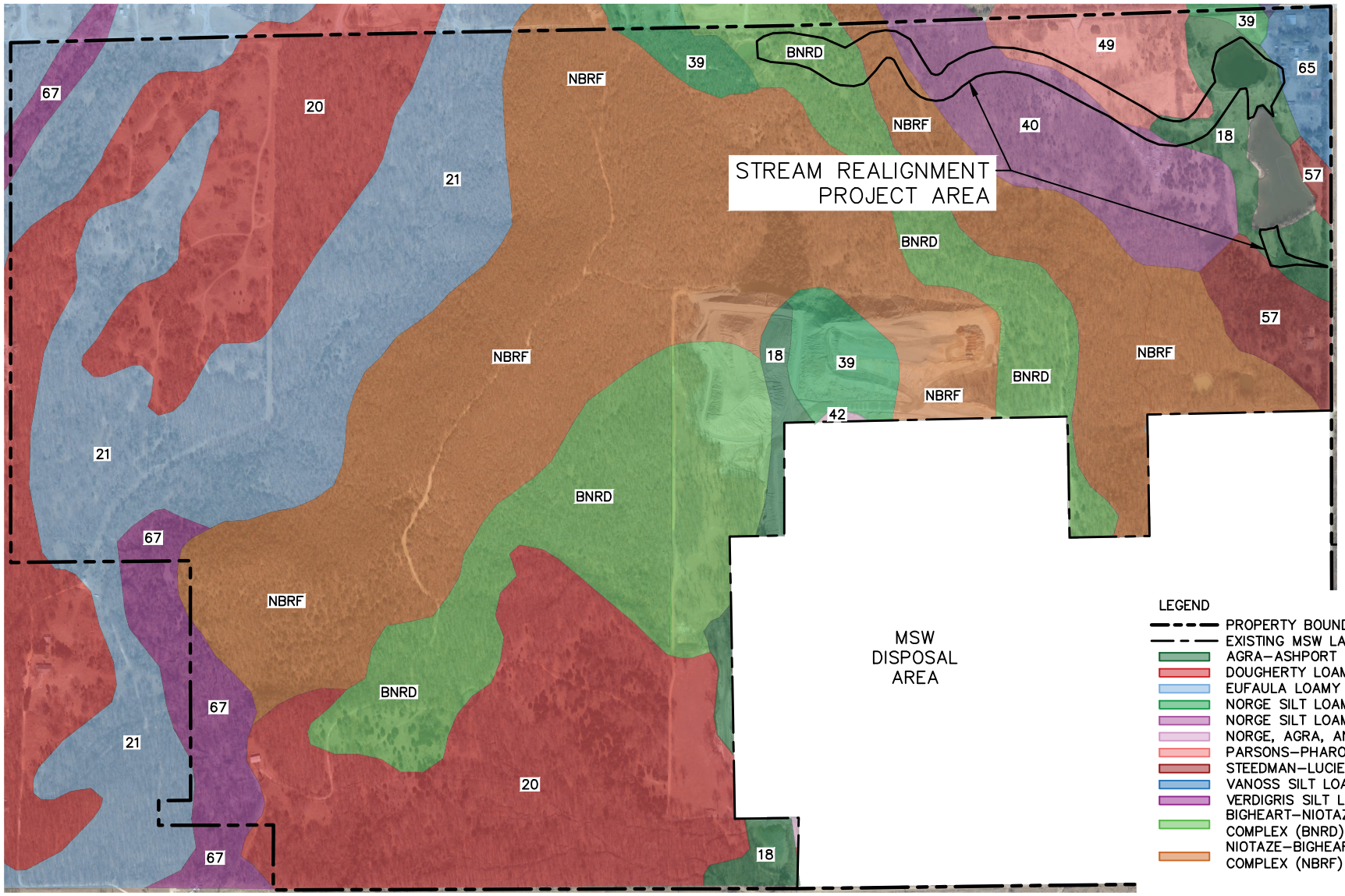


750 375 0

SCALE: 1"=750'

THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON JANUARY 15, 2020. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

NOTES:
1. BACKGROUND IMAGERY AND PROPERTY BOUNDARY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA DATED MARCH 7, 2018.
2. SOILS DATA DOWNLOADED FROM NRCS SOIL WEB SURVEY ON APRIL 29, 2019.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

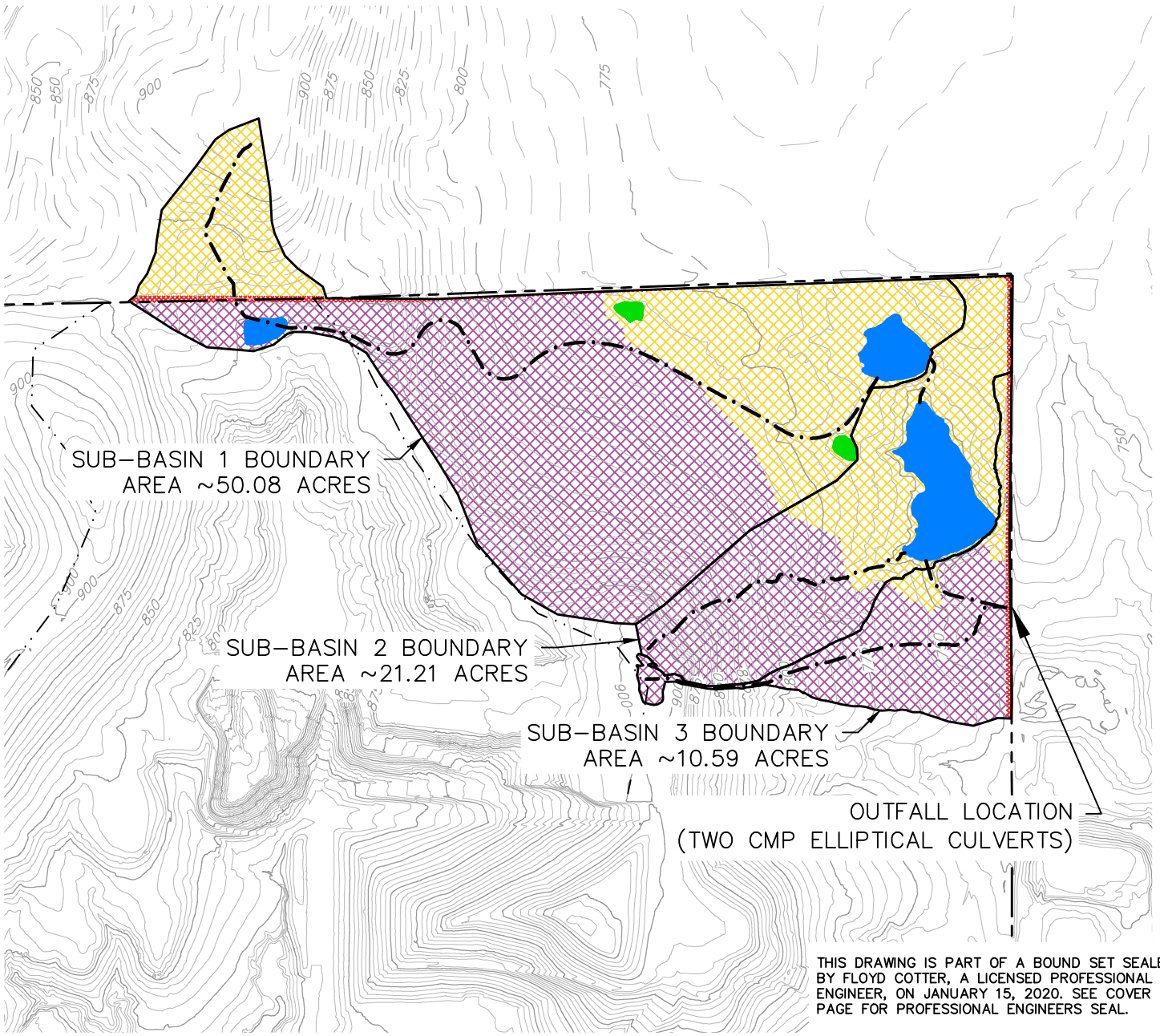
CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

SHEET TITLE:
EXISTING SOIL TYPES

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20
SCALE: AS SHOWN
DRAWING NO. 6 of 14

K:\American Environmental Landfill\27219016.00 - Landfill Expansion Evaluation\AutoCAD\2019.07 Submission-Revisions\DWG\6-Existing Soil Types.dwg Jan 16, 2020 - 2:1pm By: 4277zem



LEGEND

- 5' EXISTING CONTOUR
- 25' EXISTING CONTOUR
- 5' USGS CONTOUR
- 25' USGS CONTOUR
- PROPERTY BOUNDARY
- WETLAND
- POND
- CATCHMENT BOUNDARY
- FLOW LINE
- IMPERVIOUS SURFACE
- BRUSH AND GRASS
- WOODS

NOTES:

1. EXISTING TOPOGRAPHY AND PROPERTY BOUNDARY FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA DATED MARCH 7, 2018.
2. EXISTING WETLANDS AND PONDS LOCATED USING NATIONAL WETLANDS INVENTORY MAP AND SITE VISITS PERFORMED BY SCS ENGINEERS.
3. PORTIONS OF CATCHMENT AREA WERE OUTSIDE LIMITS OF SITE SURVEY. USGS DATA WAS USED IN AREAS WHERE SITE SPECIFIC SURVEY INFORMATION WAS NOT AVAILABLE.

HYDROLOGIC PARAMETERS:

1. HYDROLOGY CALCULATED PER NRCS TR-55 METHOD AS IMPLEMENTED BY AUTODESK STORM AND SANITARY ANALYSIS 2018
2. TOTAL CATCHMENT AREA = 86.88 ACRES
   - 2.1. IMPERVIOUS SURFACE = 1.31 ACRES
   - 2.2. POND AREA = 4.05
   - 2.3. BRUSH AND GRASS AREA = 30.91 ACRES
   - 2.4. WOODED AREA = 50.62 ACRES
3. SOIL HYDRAULIC CLASS D FROM NRCS SOIL WEB SURVEY
4. CURVE NUMBERS
   - 4.1. IMPERVIOUS SURFACE = 93
   - 4.2. POND AREA = 100
   - 4.3. BUSH AND GRASS AREA = 73
   - 4.4. WOODED AREA = 77
   - 4.5. WEIGHTED CURVE NUMBER = 76.25
5. TIME OF CONCENTRATION = 36 MINUTES
6. DESIGN STORM
   - 6.1. 25 YEAR, 24 HOUR STORM FOR OSAGE COUNTY, OKLAHOMA
   - 6.2. TOTAL RAINFALL = 6.70 INCHES
   - 6.3. APPLIED ACCORDING TO SCS TYPE II 24-HR DISTRIBUTION
7. COMPUTED RUNOFF
   - 7.1. PEAK RUNOFF = 130 CFS
   - 7.2. MEAN RUNOFF = 7 CFS

THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON JANUARY 15, 2020. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

600 300 0

SCALE: 1"=600'

SCS ENGINEERS
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OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

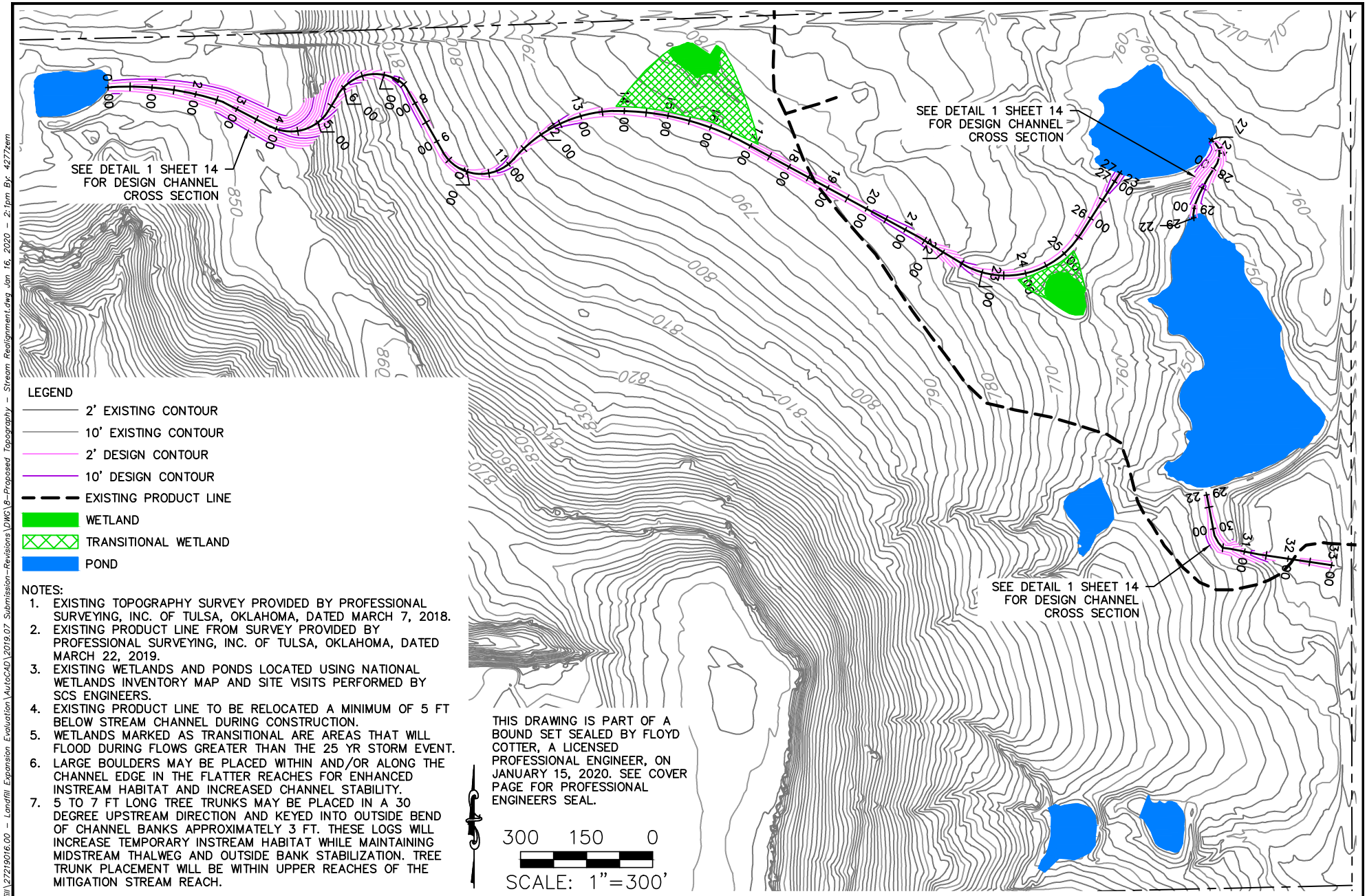
CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

SHEET TITLE:
CATCHMENT HYDROLOGY

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20
SCALE: AS SHOWN
DRAWING NO. 7 of 14

K:\American Environmental Landfill\27219016.00 - Landfill Expansion Evaluation\AutoCAD\2019.07 Submission-Revisions\DWG\7-Catchment Hydrology.dwg Jan 16, 2020 - 2:1pm By: 4277zem



NOTES:

1. EXISTING TOPOGRAPHY SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
3. EXISTING WETLANDS AND PONDS LOCATED USING NATIONAL WETLANDS INVENTORY MAP AND SITE VISITS PERFORMED BY SCS ENGINEERS.
4. EXISTING PRODUCT LINE TO BE RELOCATED A MINIMUM OF 5 FT BELOW STREAM CHANNEL DURING CONSTRUCTION.
5. WETLANDS MARKED AS TRANSITIONAL ARE AREAS THAT WILL FLOOD DURING FLOWS GREATER THAN THE 25 YR STORM EVENT.
6. LARGE BOULDERS MAY BE PLACED WITHIN AND/OR ALONG THE CHANNEL EDGE IN THE FLATTER REACHES FOR ENHANCED INSTREAM HABITAT AND INCREASED CHANNEL STABILITY.
7. 5 TO 7 FT LONG TREE TRUNKS MAY BE PLACED IN A 30 DEGREE UPSTREAM DIRECTION AND KEYED INTO OUTSIDE BEND OF CHANNEL BANKS APPROXIMATELY 3 FT. THESE LOGS WILL INCREASE TEMPORARY INSTREAM HABITAT WHILE MAINTAINING MIDSTREAM THALWEG AND OUTSIDE BANK STABILIZATION. TREE TRUNK PLACEMENT WILL BE WITHIN UPPER REACHES OF THE MITIGATION STREAM REACH.

THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON JANUARY 15, 2020. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

300 150 0

SCALE: 1"=300'

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

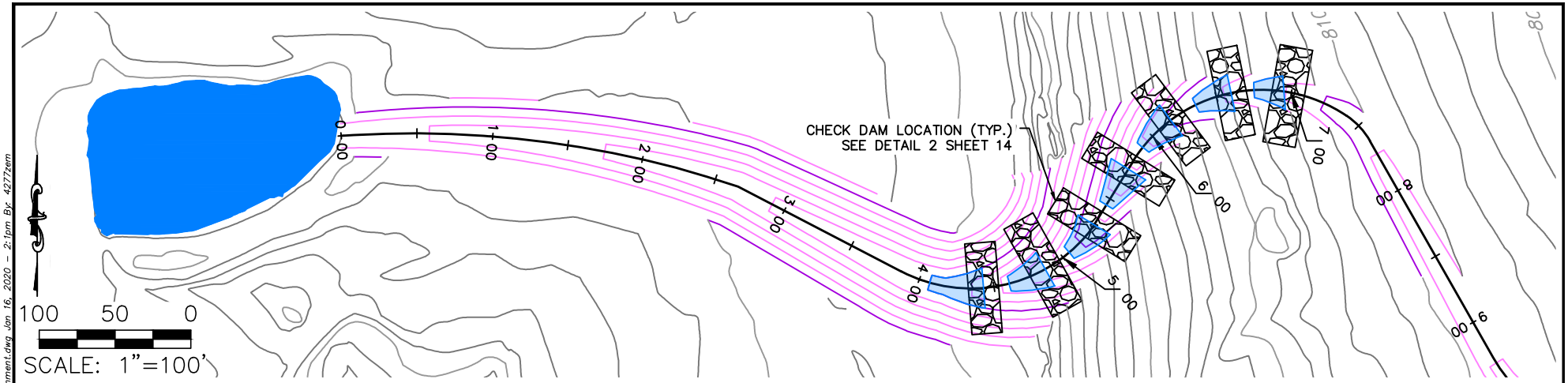
CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

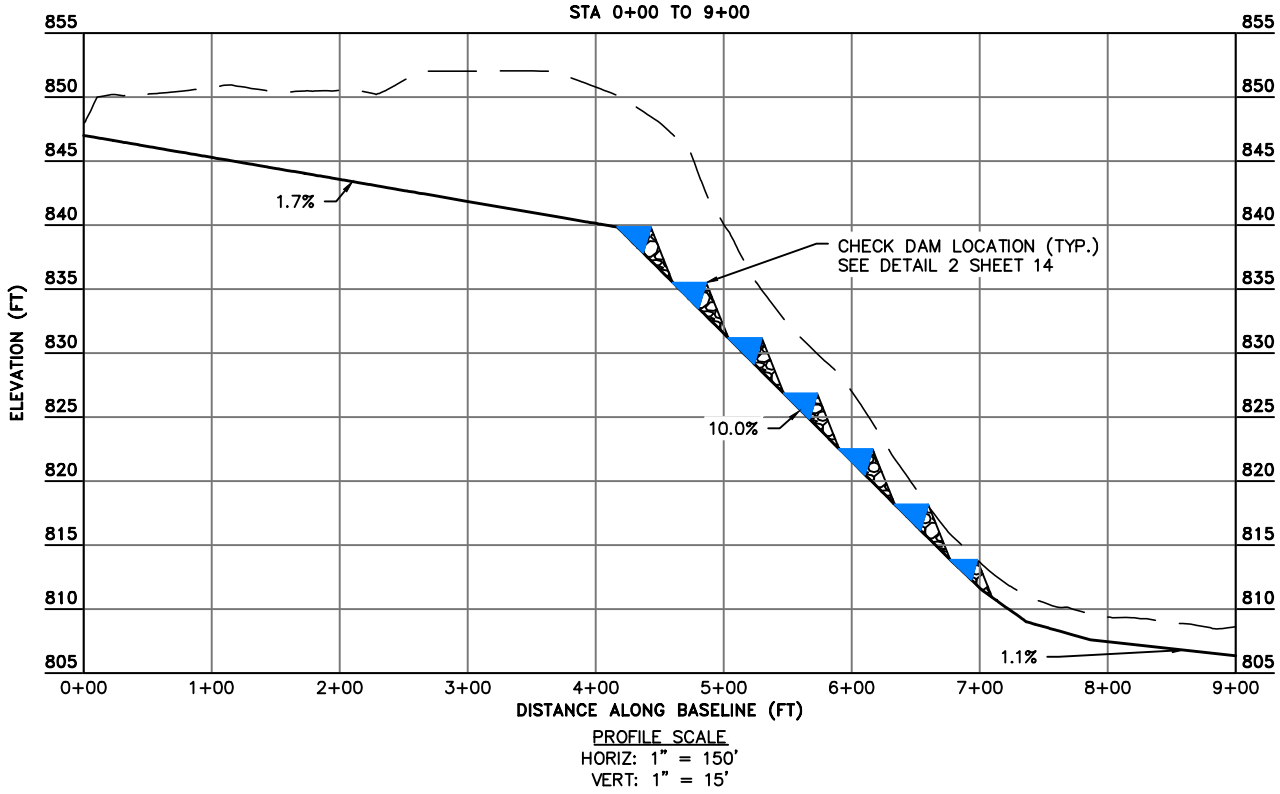
SHEET TITLE:
PROPOSED REALIGNMENT (OVERVIEW)

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20
SCALE: AS SHOWN
DRAWING NO. 8 of 14

K:\American Environmental Landfill\27219016.00 - Landfill Expansion Evaluation\AutoCAD\2019.07 Submission-Revisions\DWG\8-Proposed Topography - Stream Realignment.dwg Jan 16, 2020 - 2:1pm By: 4277zem





PROFILE SCALE
HORIZ: 1" = 150'
VERT: 1" = 15'

LEGEND

- 2' EXISTING CONTOUR
- 10' EXISTING CONTOUR
- 2' DESIGN CONTOUR
- 10' DESIGN CONTOUR
- EXISTING PROFILE
- DESIGN PROFILE
- POND
- CHECK DAM

NOTES:

1. EXISTING TOPOGRAPHY SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
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THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON JANUARY 15, 2020. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

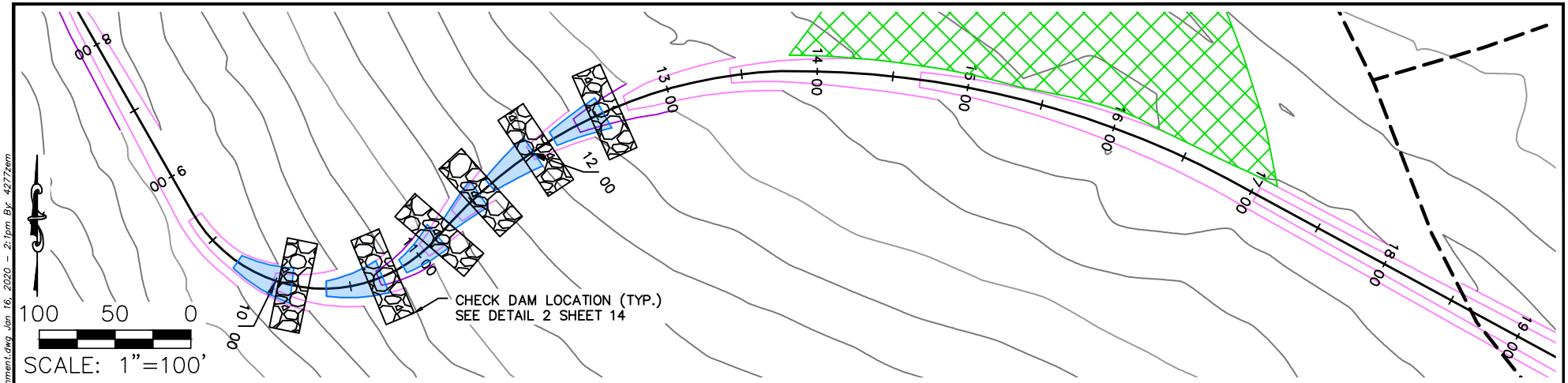
CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

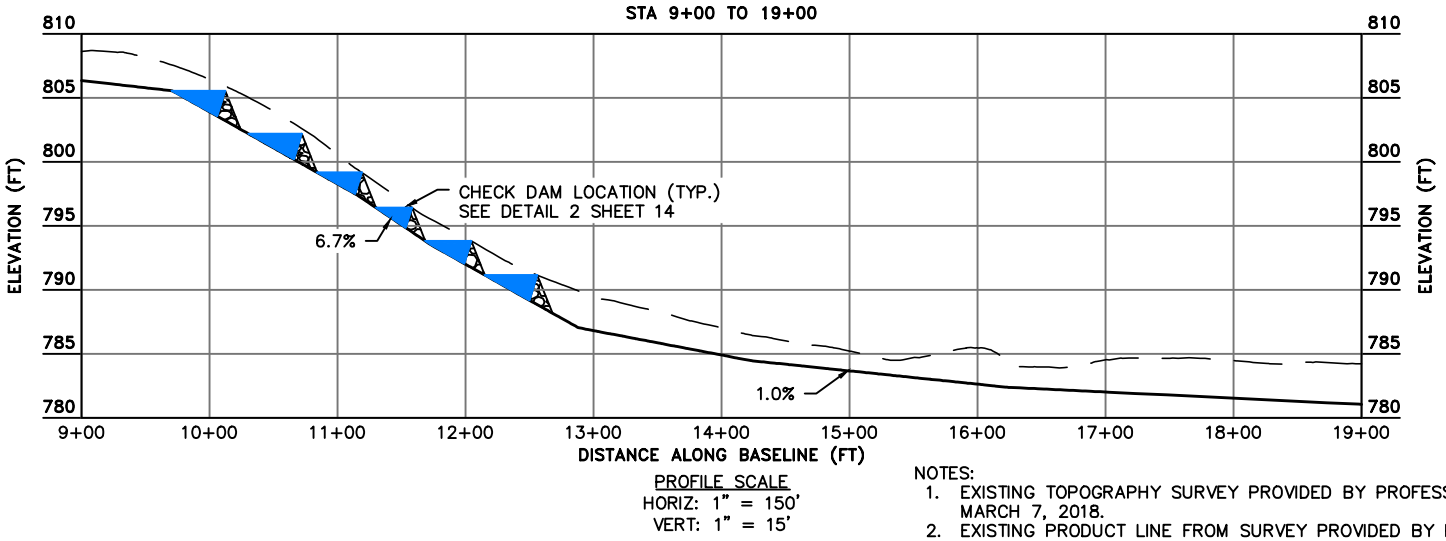
SHEET TITLE:
PROPOSED REALIGNMENT (0 TO 9+00)

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20
SCALE: AS SHOWN
DRAWING NO. 9 of 14

K:\American Environmental Landfill\27219016.00 - Landfill Expansion Evaluation\AutoCAD\2019.07 Submission-Revisions\DWG\8-Proposed Topography - Stream Realignment.dwg Jan 16, 2020 - 2:1pm By: 4277zem





PROFILE SCALE
HORIZ: 1" = 150'
VERT: 1" = 15'

LEGEND
- 2' EXISTING CONTOUR
- 10' EXISTING CONTOUR
- 2' DESIGN CONTOUR
- 10' DESIGN CONTOUR
- EXISTING PROFILE
- DESIGN PROFILE
- EXISTING PRODUCT LINE
- TRANSITIONAL WETLAND
- POND
- CHECK DAM

NOTES:
1. EXISTING TOPOGRAPHY SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
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THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON JANUARY 15, 2020. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

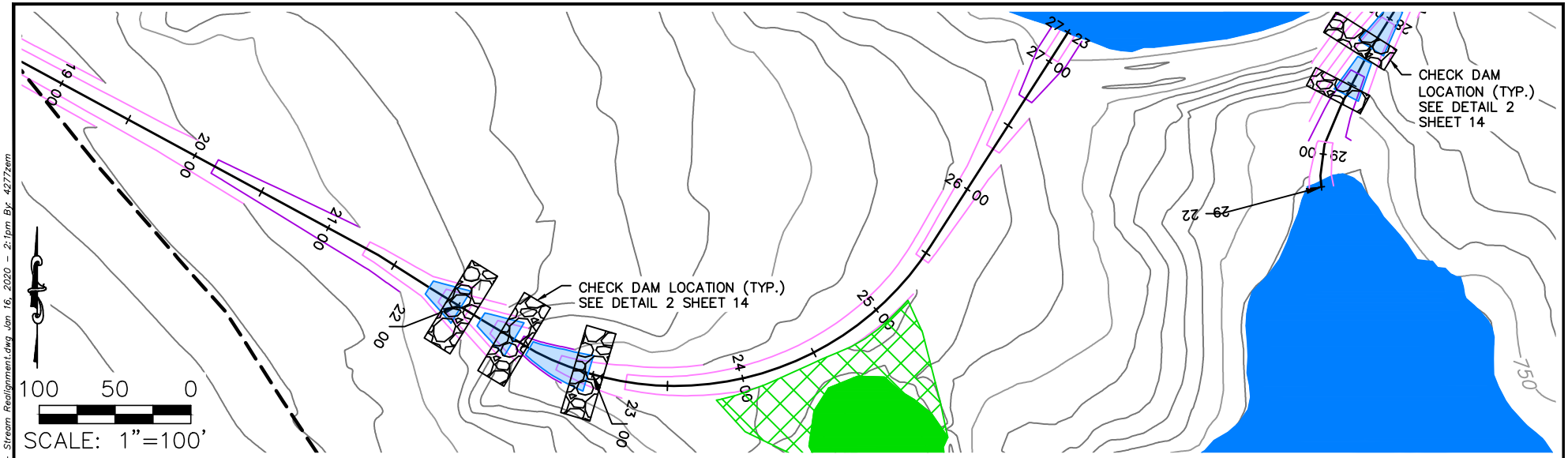
CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

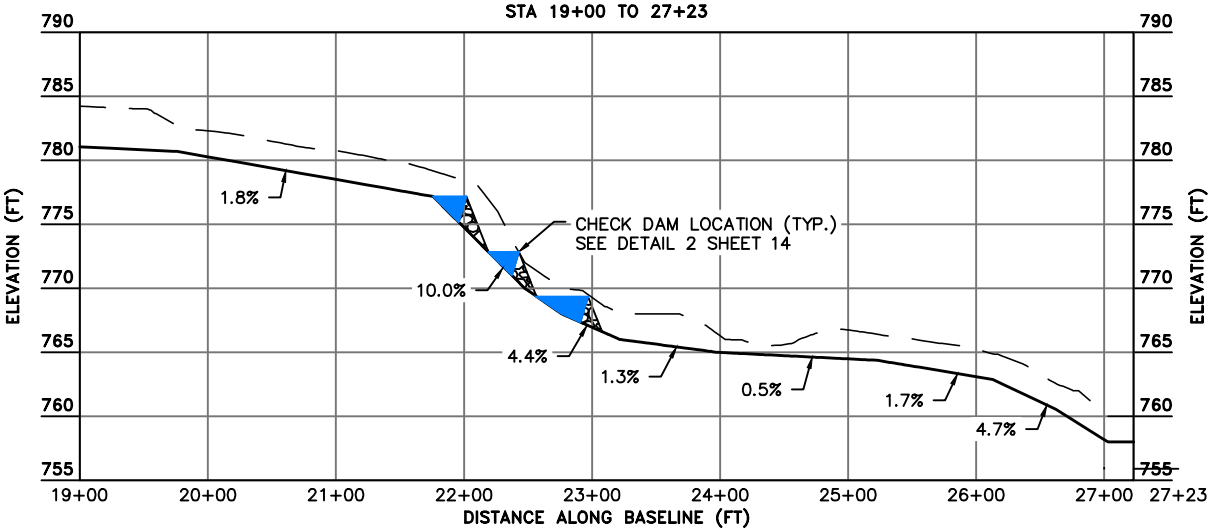
SHEET TITLE:
PROPOSED REALIGNMENT (9+00 TO 19+00)

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20
SCALE: AS SHOWN
DRAWING NO. 10 of 14

K:\American Environmental Landfill\27219016.00 - Landfill Expansion Evaluation\AutoCAD\2019.07 Submission-Revisions\DWG\8-Proposed Topography - Stream Realignment.dwg Jan 16, 2020 - 2:1pm By: 4277zem





PROFILE SCALE
HORIZ: 1" = 150'
VERT: 1" = 15'

LEGEND

- 2' EXISTING CONTOUR
- 10' EXISTING CONTOUR
- 2' DESIGN CONTOUR
- 10' DESIGN CONTOUR
- EXISTING PROFILE
- DESIGN PROFILE
- EXISTING PRODUCT LINE
- WETLAND
- TRANSITIONAL WETLAND
- POND
- CHECK DAM

NOTES:

1. EXISTING TOPOGRAPHY SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
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THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON JANUARY 15, 2020. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

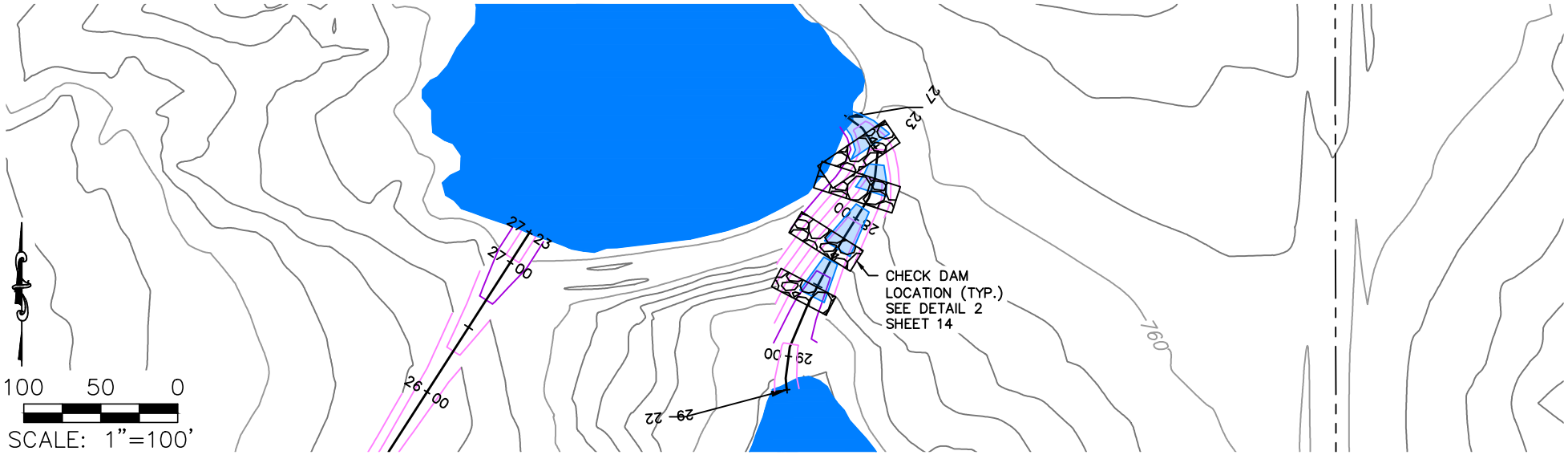
CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

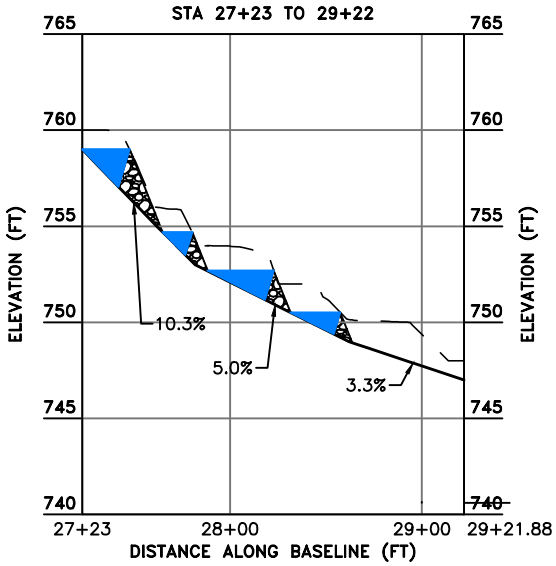
SHEET TITLE:
PROPOSED REALIGNMENT (19+00 TO 27+23)

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20
SCALE: AS SHOWN
DRAWING NO. 11 of 14

K:\American Environmental Landfill\27219016.00 - Landfill Expansion Evaluation\AutoCAD\2019.07 Submission-Revisions\DWG\8-Proposed Topography - Stream Realignment.dwg Jan 16, 2020 - 2:1pm By: 4277zem





PROFILE SCALE
HORIZ: 1" = 100'
VERT: 1" = 10'

LEGEND

- 2' EXISTING CONTOUR
- 10' EXISTING CONTOUR
- 2' DESIGN CONTOUR
- 10' DESIGN CONTOUR
- EXISTING PROFILE
- DESIGN PROFILE
- EXISTING PRODUCT LINE
- WETLAND
- TRANSITIONAL WETLAND
- POND
- CHECK DAM

NOTES:

1. EXISTING TOPOGRAPHY SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
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THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON JANUARY 15, 2020. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

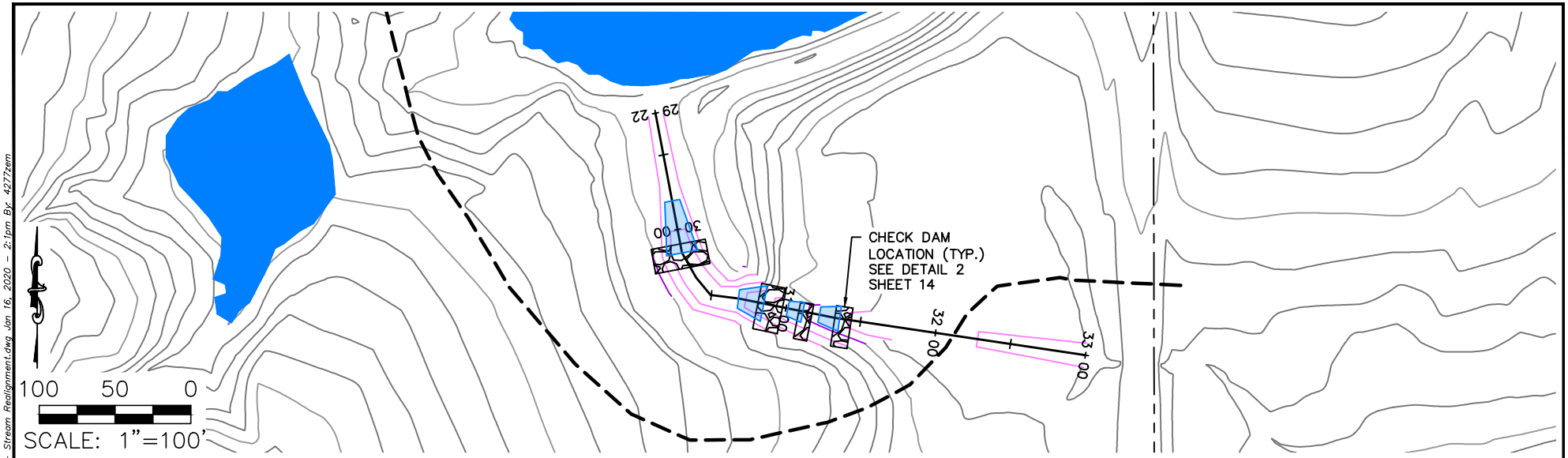
CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

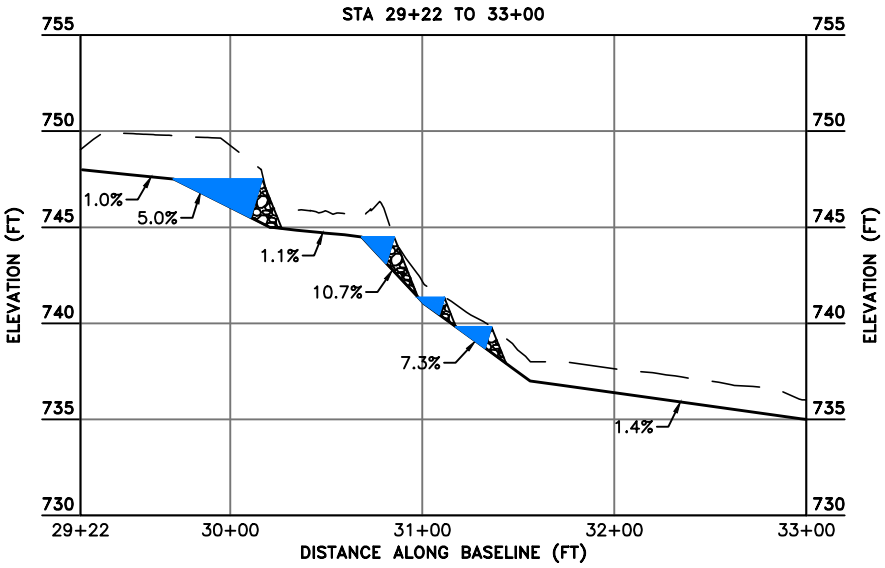
SHEET TITLE:
PROPOSED REALIGNMENT (27+23 TO 29+22)

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20
SCALE: AS SHOWN
DRAWING NO. 12 of 14

K:\American Environmental Landfill\27219016.00 - Landfill Expansion Evaluation\AutoCAD\2019.07 Submission-Revisions\DWG\8-Proposed Topography - Stream Realignment.dwg Jan 16, 2020 - 2:1pm By: 4277zem





PROFILE SCALE
HORIZ: 1" = 100'
VERT: 1" = 10'

LEGEND

- 2' EXISTING CONTOUR
- 10' EXISTING CONTOUR
- 2' DESIGN CONTOUR
- 10' DESIGN CONTOUR
- EXISTING PROFILE
- DESIGN PROFILE
- EXISTING PRODUCT LINE
- WETLAND
- TRANSITIONAL WETLAND
- POND
- CHECK DAM

NOTES:

1. EXISTING TOPOGRAPHY SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
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THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON JANUARY 15, 2020. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

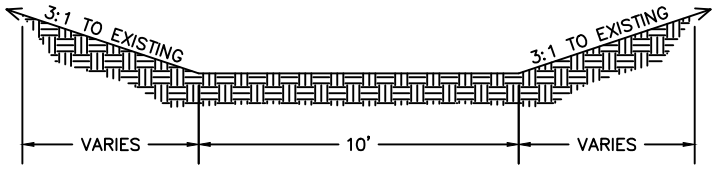
CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

SHEET TITLE:
PROPOSED REALIGNMENT (29+22 TO 32+00)

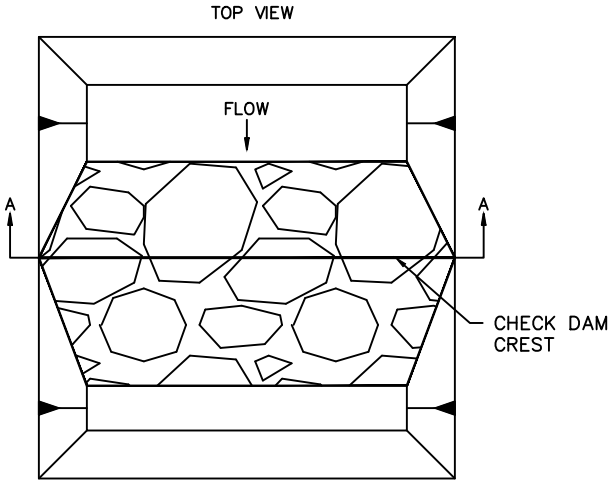
PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

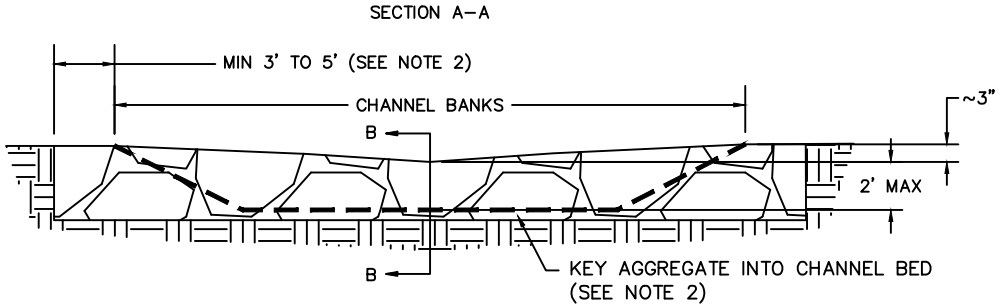
DATE: 1/15/20
SCALE: AS SHOWN
DRAWING NO. 13 of 14

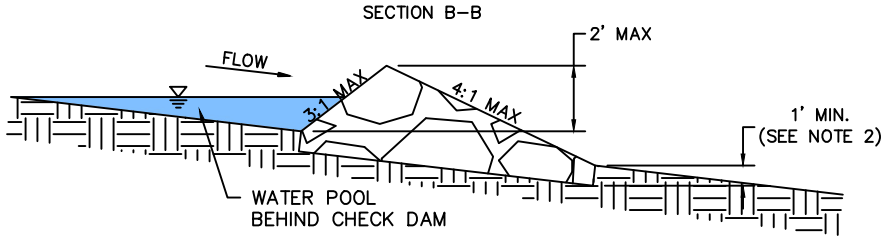
K:\American Environmental Landfill\27219016.00 - Landfill Expansion Evaluation\AutoCAD\2019.07 Submission-Revisions\DWG\8-Proposed Topography - Stream Realignment.dwg Jan 16, 2020 - 2:1pm By: 4277zem



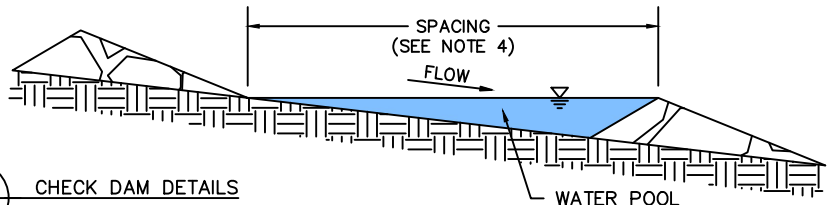
1 DESIGN CHANNEL CROSS SECTION
NOT TO SCALE







NOTES:
1. CHECK DAMS SHALL BE CONSTRUCTED OF NATIVE AGGREGATE HAVING A D_{50} EQUAL TO OR GREATER THAN 9 INCHES.
2. AGGREGATE FOR CHECK DAMS SHALL BE KEYED INTO CHANNEL BANKS A MINIMUM OF 3 FEET ON STRAIGHT SECTIONS AND INSIDE CURVES, A MINIMUM OF 5 FEET ON OUTSIDE CURVES, AND A MINIMUM OF 1 FOOT INTO THE CHANNEL BED TO REDUCE LIKELIHOOD OF BYPASS FLOW AND EXCESSIVE SCOUR.
3. CHECK DAMS SHALL BE CONSTRUCTED WITH THE LOWEST POINT LOCATED AT THE CHANNEL CENTERLINE TO DIRECT FLOW INTO THE CENTER OF THE CHANNEL.
4. CHECK DAMS SHALL BE SPACED SUCH THAT THE CREST OF THE DOWNSTREAM DAM IS APPROXIMATELY LEVEL WITH THE LOWEST ELEVATION OF THE UPSTREAM DAM.



2 CHECK DAM DETAILS
NOT TO SCALE

THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON JANUARY 15, 2020. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW. BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	MPP	WM

CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

SHEET TITLE:
DETAILS

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 1/15/20
SCALE: AS SHOWN
DRAWING NO. 14 of 14

K:\American Environmental Landfill\27219016.00 - Landfill Expansion Evaluation\AutoCAD\2019.07 Submission-Revisions\DWG\14-Details.dwg Jan 16, 2020 - 2:1pm By: 4277zem

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
2488 EAST 81ST STREET
TULSA, OKLAHOMA 74137-4290

October 30, 2020

Regulatory Office

Mr. Todd Green
American Environmental Landfill
207 North 117th West Avenue
Sand Springs, OK 74063

Dear Mr. Green:

Enclosed is an executed copy of your Department of the Army Permit No. SWT-2017-00339. Please retain this copy for your files.

We request that in conjunction with this permit, you complete and return the enclosed self-addressed "Permittee Construction Schedule" form. Should construction be initiated prior to 30 days from receipt of this letter, please return the completed form as soon as possible. If you prefer, you may contact Mr. Marcus Ware at 918-669-7403 to inform this office regarding the construction start date.

Following completion of your proposed activity, complete and return the enclosed self-addressed "Permittee Compliance Certification" form, as required by Permit Special Condition 2.

If you desire to complete a "Customer Service Survey" on your experience with the Corps Regulatory Program, you are invited to visit http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey on the internet at your convenience and submit your comments.

Sincerely,

Andrew R. Commer

Andrew R. Commer
Chief, Regulatory Office

Enclosures

cc:
Ms. Maria Martinez, U.S. Environmental Protection Agency
Ms. Elena Jigoulina, Oklahoma Department of Environmental Quality

DEPARTMENT OF THE ARMY PERMIT

Name of Permittee: Mr. Todd Green, American Environmental Landfill

Permit No.: SWT-2017-00339

Issuing Office: U.S. Army Corps of Engineers, Tulsa District, Regulatory Office

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: This permit authorizes the after-the-fact (ATF) permit for placement of fill material into an unnamed tributary of Arkansas River utilizing earthen material (514.71 cy) for approximately 4,517 lf (0.502 ac) and also includes the placement of fill material for the proposed lateral AEL expansion of the existing active solid waste landfill. The applicant has proposed to use earthen material (landfill cap) for a containment barrier to prevent the environment from the harmful effects of its contents and perhaps limiting the migration of the contents.

Work shall be completed in accordance with Attached Drawings 1 thru 8 of SWT-2017-339 AEL Enclosures.pdf.

The fill material may consist of earthen material. The work would be performed using conventional earth moving equipment.

Project Location: The proposed project is in the North ½ of Section 35 and West ½ of Section 36, Township 20 North, Range 10 East, in Sand Springs, Osage County, Oklahoma. The project site can be found on the Wekiwa Oklahoma 7.5 Minute USGS Quadrangle map.

North Latitude 36.165971 and West Longitude 96.199087

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on October 31, 2023. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 1 month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. Permittee Construction Schedule: Prior to commencing construction, you shall complete and return the "Permittee Construction Schedule" form. Should construction be initiated prior to 30 days from validation of this permit, return the completed form as soon as possible. If you prefer, you may telephone 918-669-7400 to inform this office regarding the construction start date. A copy of the "Permittee Construction Schedule" form would accompany the validated permit and final authorization letter.

2. Compliance Certification: Following completion of the authorized activity, the permittee shall submit a signed certification regarding the completed work and any required mitigation. A copy of the "Permittee Compliance Certification" form would accompany the validated permit and final authorization letter.

3. Erosion Control Measures (ECM): The ECM, such as staked hay bales or silt screen barriers, shall be implemented and maintained during construction. Barriers shall remain in place and effective until sufficient vegetation coverage on exposed areas is established. Upon inspection of erosion control barriers, if there is any damage to the barrier, it shall be replaced or repaired within 24 hours of discovery. All exposed earthen areas, disturbed or newly created by the construction, shall be seeded immediately, replanted, or provided equivalent protection against subsequent erosion.

4. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately cease work and notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

5. Mitigation Success Verification: Your responsibility to complete the required compensatory mitigation as set forth in Special Condition 5 will not be considered fulfilled until you have demonstrated compensatory mitigation project success and have received written verification of that success from the U.S. Army Corps of Engineers.

6. Restoration Plan: The permittee shall implement the American Environmental Landfill Project, Compensatory Mitigation Plan (SWT-2017-339) dated May 1, 2020, in addition to the following:

a. Financial Assurances: The permittee shall execute a bond or a letter of credit. The instrument shall be submitted the Corps within 60 days of the executed permit, no work shall begin until the condition is satisfied.

b. Protection of Riparian Corridor: The permittee shall minimize impacts to the riparian zone:

(1) You shall file the deed restriction at the Osage County Clerk office within 30 days. A copy of the deed restriction should be submitted to our office within 15 days after it has been filed with the Osage County Clerk.

(2) Signs shall be utilized to delineate the boundary of the mitigation areas. The signs shall include clear identification of a mitigation site, U.S. Army Corps of Engineers permit identification number SWT-2017-339, and contact information for responsible parties. The signs shall be placed in 200-foot intervals (or line of sight) on the perimeter of each mitigated feature.

(3) Fence: The permittee shall construct a fence around the mitigation area.

(4) Mowing: Lawn mowing will not be allowed within the restoration area. Maintenance mowing can be approved by the Corps after notification.

7. Fuels and Hazardous Materials: Any fuels or other hazardous materials used shall be stored or stockpiled above the Ordinary High Water Mark (OHWM) and shall be removed from a likely flood zone prior to any predicted flood.

8. Fueling: All vehicles and equipment shall be fueled and serviced above the OHWM.

9. Stockpile Area: The stockpile area shall not be located in a jurisdictional wetland or stream. You shall incorporate an ECM along the entire length of the stockpile area to prevent excavated material from eroding in the upland location.

10. Monitoring for Stream Impacts: The permittee shall monitor the unnamed tributary of the Shell Creek for destabilization upstream and downstream of the bank protection project for a period of 5 years. If stream destabilization occurs during this period, the permittee shall be required to notify the Corps, Regulatory Office immediately in writing.

This report shall assess the condition of the stream. The permittee shall include photographs of the stream channel and degraded area. After notification is made, the permittee may be required to submit a proposal to correct the destabilization of the stream channel.

11. Fill Material: You shall only use clean dredged or fill material free of contaminates.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:
( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).
( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

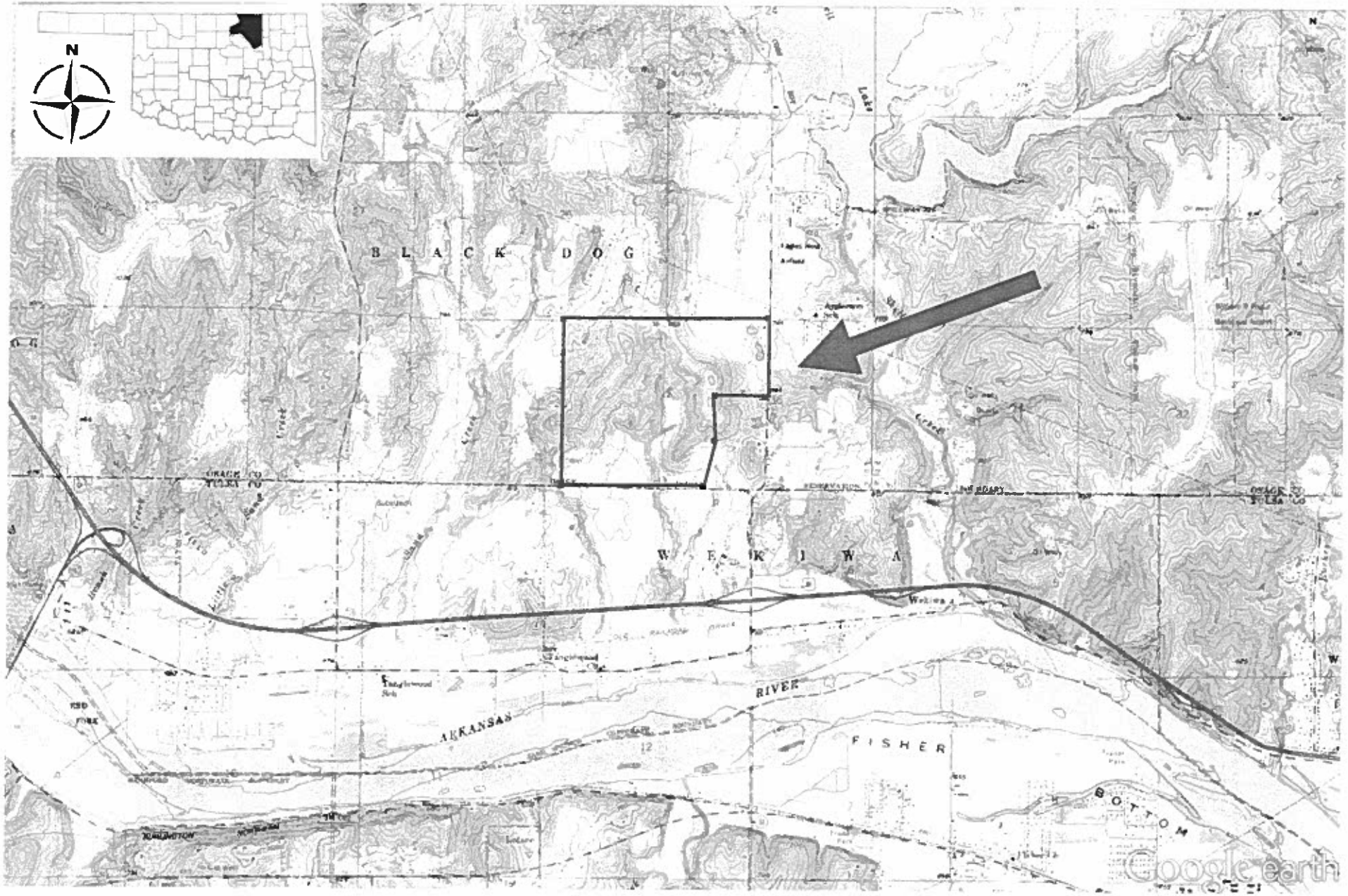
5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

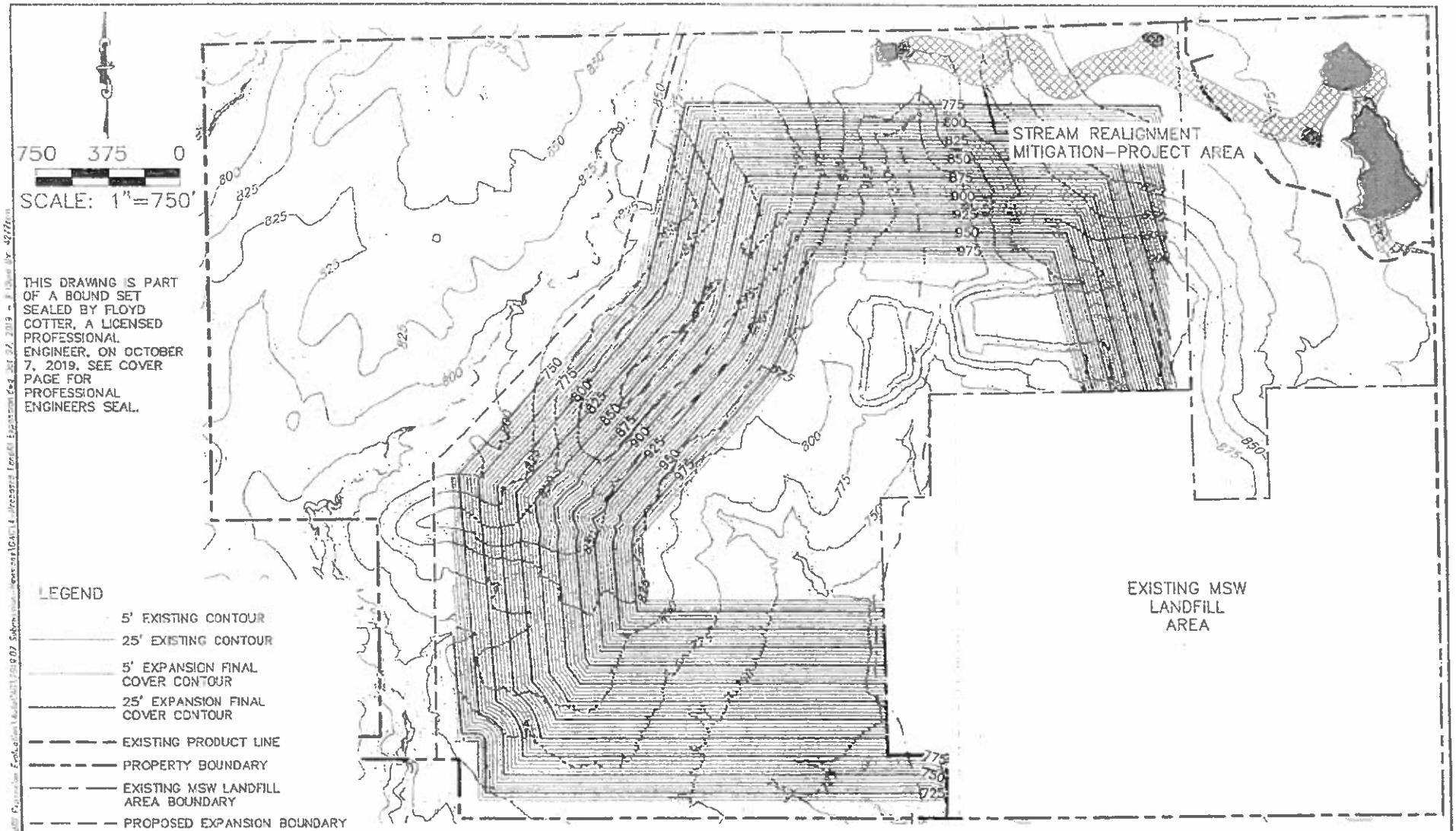
a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the


N
B L A C K D O G
W E K I W A
ARKANSAS RIVER
FISHER
B O T T O M
Google earth



THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON OCTOBER 7, 2019. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

LEGEND

- 5' EXISTING CONTOUR
- 25' EXISTING CONTOUR
- 5' EXPANSION FINAL COVER CONTOUR
- 25' EXPANSION FINAL COVER CONTOUR
- EXISTING PRODUCT LINE
- PROPERTY BOUNDARY
- EXISTING MSW LANDFILL AREA BOUNDARY
- PROPOSED EXPANSION BOUNDARY
- STREAM
- WETLAND
- POND
- PROPOSED MITIGATION–PROJECT AREA

NOTES:

1. EXISTING TOPOGRAPHY, PROPERTY BOUNDARY AND ROADWAYS FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED
3. EXISTING STREAMS, WETLANDS, AND PONDS LOCATED USING NATIONAL WETLANDS INVENTORY MAP AND SITE VISITS PERFORMED BY SCS ENGINEERS.
4. FINAL COVER CONTOURS SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

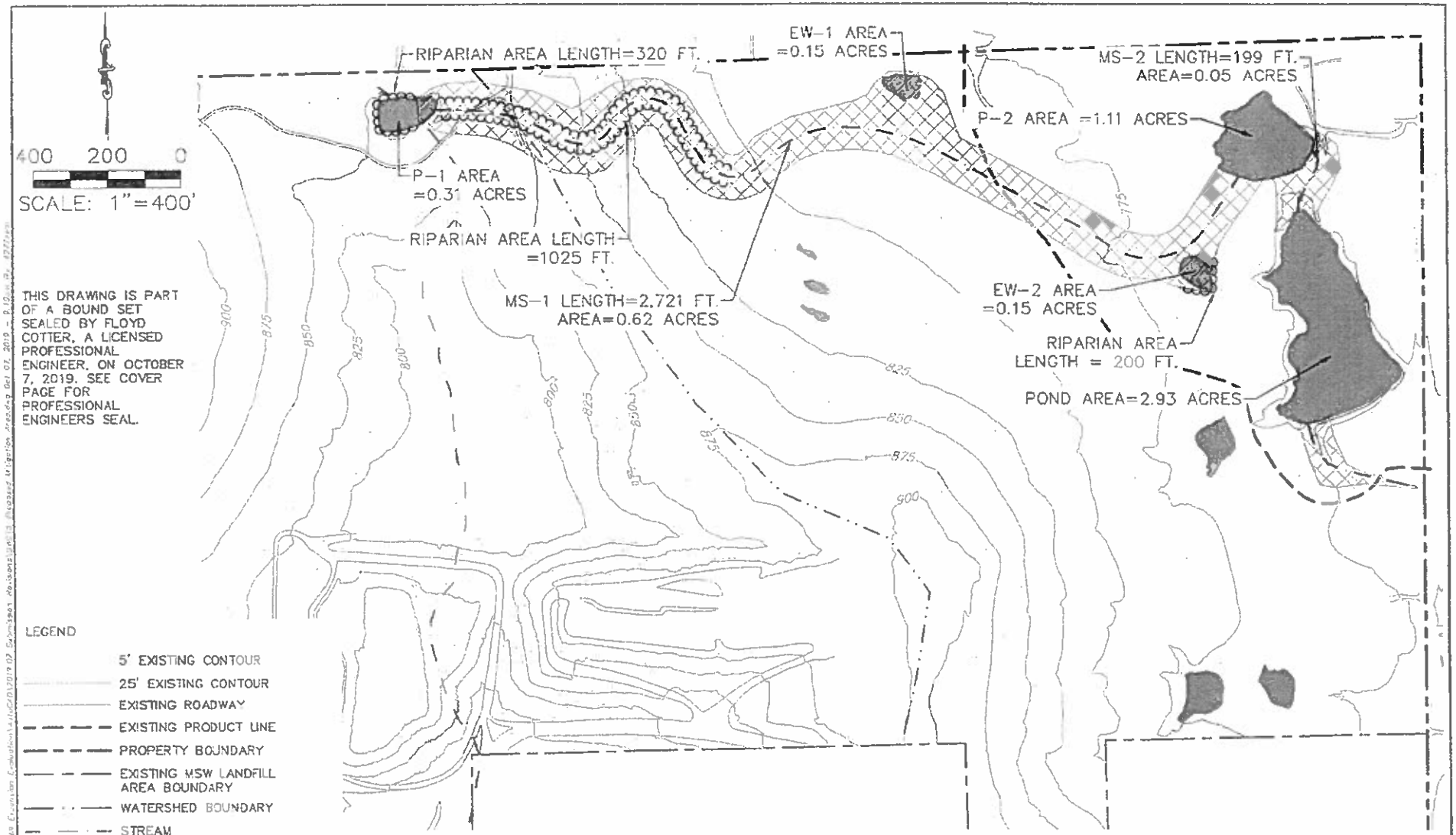
PROJ. NO.	DES. BY	Q/A REV. BY
27219016.00	ZEM	VW
DRN. BY	CHK. BY	PROJ. MGR.
ZEM	MPP	WM

CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

SHEET TITLE:
PROPOSED LANDFILL EXPANSION

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 10/7/19
SCALE: SCALE
DRAWING NO. 4 of 13



NOTES:
1. EXISTING TOPOGRAPHY, PROPERTY BOUNDARY AND ROADWAYS FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
3. EXISTING STREAMS, WETLANDS, AND PONDS LOCATED USING NATIONAL WETLANDS INVENTORY MAP AND SITE VISITS PERFORMED BY SCS ENGINEERS.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

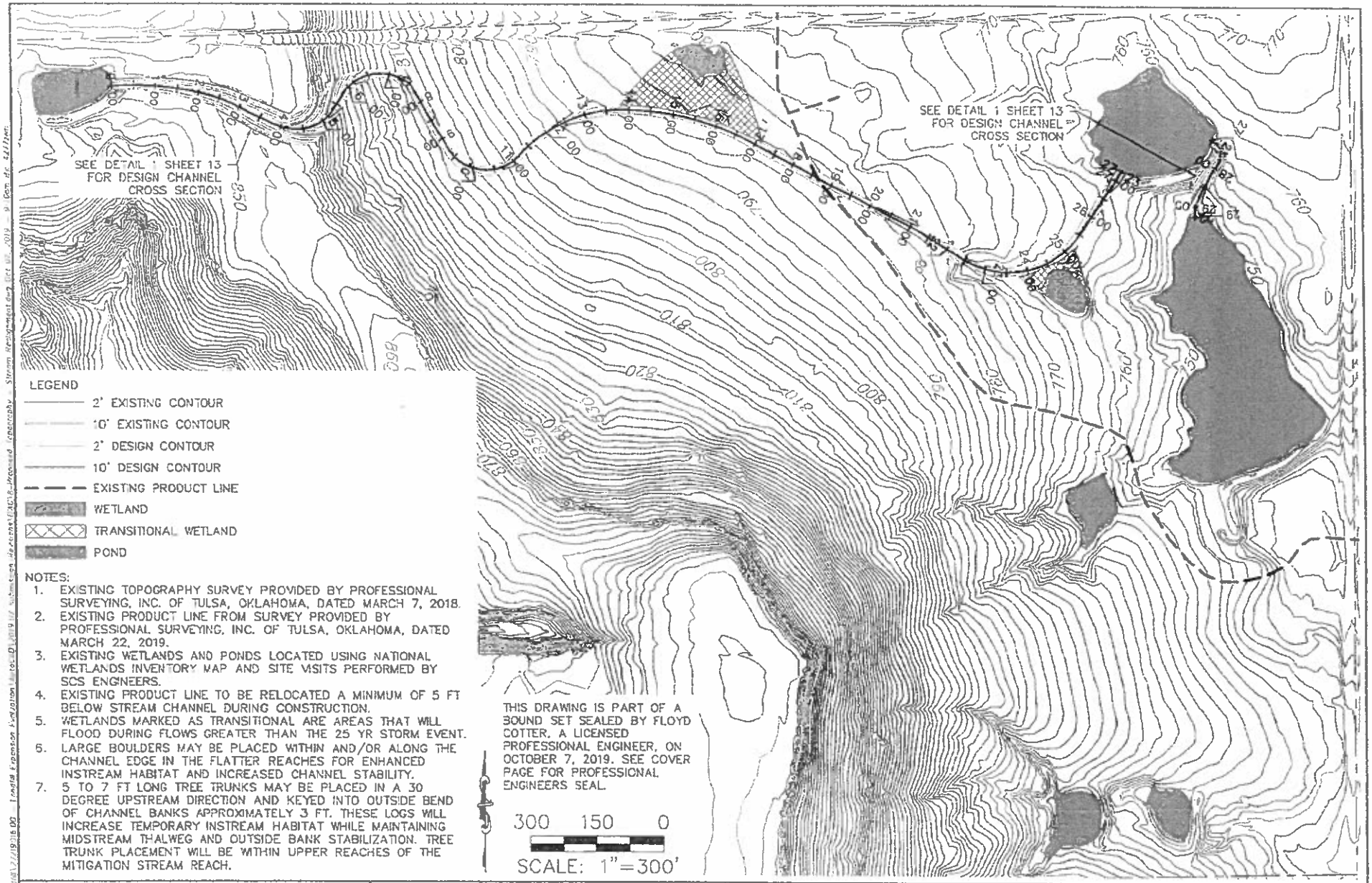
PROJ. NO.	DSN. BY	QA/QC BY
27219016.00	ZEM	VW
DWN. BY	CHK. BY	PROJ. MGR
ZEM	MPP	WM

CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

SHEET TITLE:
PROPOSED MITIGATION AREA

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 10/7/19
SCALE: AS SHOWN
DRAWING NO. 5 of 13



NOTES:

1. EXISTING TOPOGRAPHY SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
3. EXISTING WETLANDS AND PONDS LOCATED USING NATIONAL WETLANDS INVENTORY MAP AND SITE VISITS PERFORMED BY SCS ENGINEERS.
4. EXISTING PRODUCT LINE TO BE RELOCATED A MINIMUM OF 5 FT BELOW STREAM CHANNEL DURING CONSTRUCTION.
5. WETLANDS MARKED AS TRANSITIONAL ARE AREAS THAT WILL FLOOD DURING FLOWS GREATER THAN THE 25 YR STORM EVENT.
6. LARGE BOULDERS MAY BE PLACED WITHIN AND/OR ALONG THE CHANNEL EDGE IN THE FLATTER REACHES FOR ENHANCED INSTREAM HABITAT AND INCREASED CHANNEL STABILITY.
7. 5 TO 7 FT LONG TREE TRUNKS MAY BE PLACED IN A 30 DEGREE UPSTREAM DIRECTION AND KEYED INTO OUTSIDE BEND OF CHANNEL BANKS APPROXIMATELY 3 FT. THESE LOGS WILL INCREASE TEMPORARY INSTREAM HABITAT WHILE MAINTAINING MIDSTREAM THALWEG AND OUTSIDE BANK STABILIZATION. TREE TRUNK PLACEMENT WILL BE WITHIN UPPER REACHES OF THE MITIGATION STREAM REACH.

THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON OCTOBER 7, 2019. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

300 150 0

SCALE: 1"=300'

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DES. BY	Q/A REVIEW BY
27219C16.00	ZEM	VW
DRAWN BY	CHK. BY	PRINT DATE
ZEM	MPP	VW

CLIENT:

AMERICAN ENVIRONMENTAL LANDFILL, INC.

AMERICAN ENVIRONMENTAL LANDFILL

SAND SPRINGS, OKLAHOMA

SHEET TITLE:

PROPOSED REALIGNMENT (OVERVIEW)

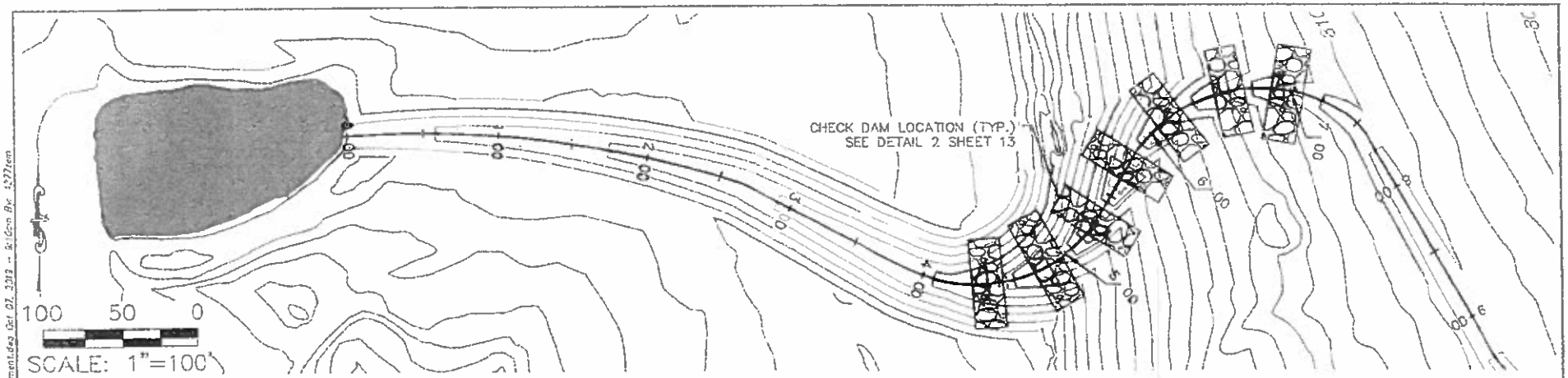
PROJECT TITLE:

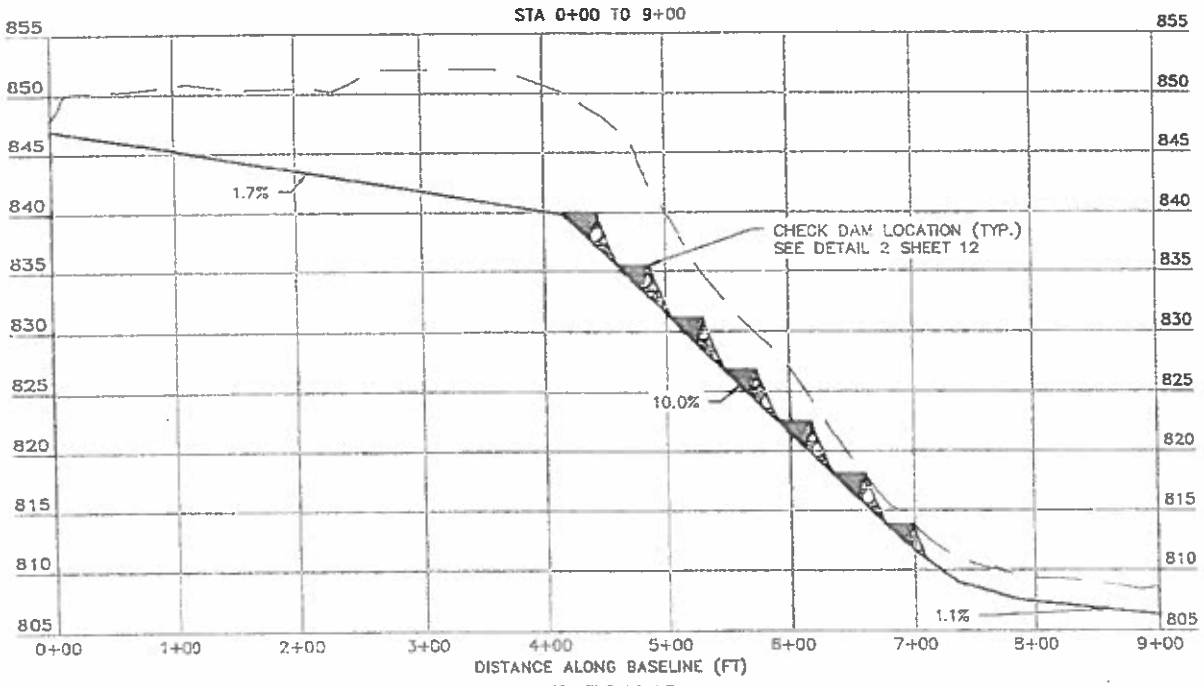
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 10/7/19

SCALE: SCALE

DRAWING NO.: 8 of 13





PROFILE SCALE
HORIZ: 1" = 150'
VERT: 1" = 15'

LEGEND

- 2' EXISTING CONTOUR
- 10' EXISTING CONTOUR
- 2' DESIGN CONTOUR
- 10' DESIGN CONTOUR
- EXISTING PROFILE
- DESIGN PROFILE
- POND
- CHECK DAM

NOTES:

1. EXISTING TOPOGRAPHY SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
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4. EXISTING PRODUCT LINE TO BE RELOCATED A MINIMUM OF 5 FT BELOW STREAM CHANNEL DURING CONSTRUCTION.
5. WETLANDS MARKED AS TRANSITIONAL ARE AREAS THAT WILL FLOOD DURING FLOWS GREATER THAN THE 25 YR STORM EVENT.
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THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON OCTOBER 7, 2019. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DSN. BY:	R/W DWN. BY:
27219016.00	ZEM	VW
CHK. BY:	CHK. BY:	PROJ. MGR.
ZEM	MPD	WJ

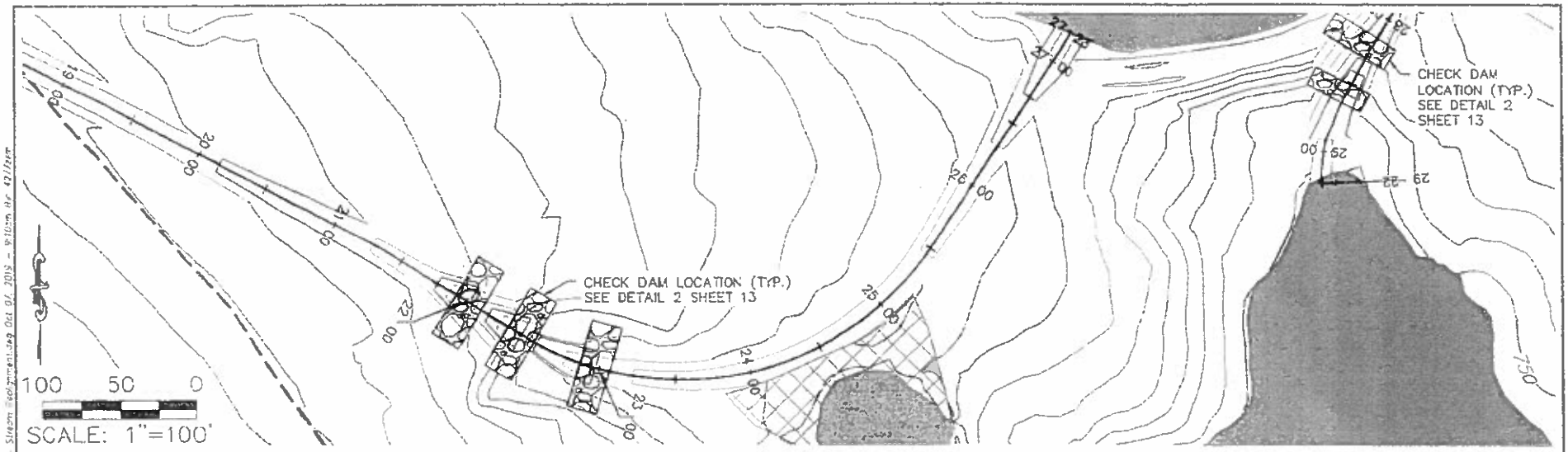
CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

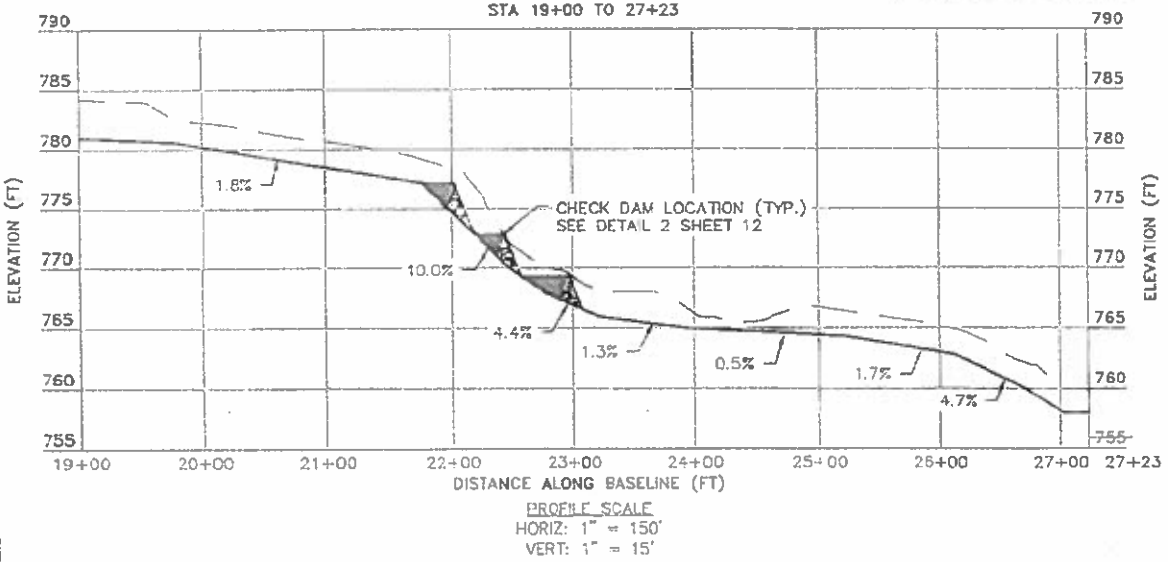
SHEET TITLE:
PROPOSED REALIGNMENT (0 TO 9+00)

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 10/7/19
SCALE: SCALE
DRAWING NO.
9 of 13

J:\Projects\Environmental Land\27219016.00 - Lo-die Expansion Evaluation\CAD\2019 07 Submission-Revision 1\MCE-Proposed Topography - Stream Realignment.dwg Oct 07, 2019 -- Baldwin Bro 1277tem





PROFILE SCALE
HORIZ: 1" = 150'
VERT: 1" = 15'

LEGEND

- 2' EXISTING CONTOUR
- 10' EXISTING CONTOUR
- 2' DESIGN CONTOUR
- 10' DESIGN CONTOUR
- EXISTING PROFILE
- DESIGN PROFILE
- EXISTING PRODUCT LINE
- WETLAND
- TRANSITIONAL WETLAND
- POND
- CHECK DAM

NOTES:

1. EXISTING TOPOGRAPHY SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
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4. EXISTING PRODUCT LINE TO BE RELOCATED A MINIMUM OF 5 FT BELOW STREAM CHANNEL DURING CONSTRUCTION.
5. WETLANDS MARKED AS TRANSITIONAL ARE AREAS THAT WILL FLOOD DURING FLOWS GREATER THAN THE 25 YR STORM EVENT.
6. LARGE BOULDERS MAY BE PLACED WITHIN AND/OR ALONG THE CHANNEL EDGE IN THE FLATTER REACHES FOR ENHANCED INSTREAM HABITAT AND INCREASED CHANNEL STABILITY.
7. 5 TO 7 FT LONG TREE TRUNKS MAY BE PLACED IN A 30 DEGREE UPSTREAM DIRECTION AND KEYED INTO OUTSIDE BEND OF CHANNEL BANKS APPROXIMATELY 3 FT. THESE LOGS WILL INCREASE TEMPORARY INSTREAM HABITAT WHILE MAINTAINING MIDSTREAM THALWEG AND OUTSIDE BANK STABILIZATION. TREE TRUNK PLACEMENT WILL BE WITHIN UPPER REACHES OF THE MITIGATION STREAM REACH.

THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON OCTOBER 7, 2019. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

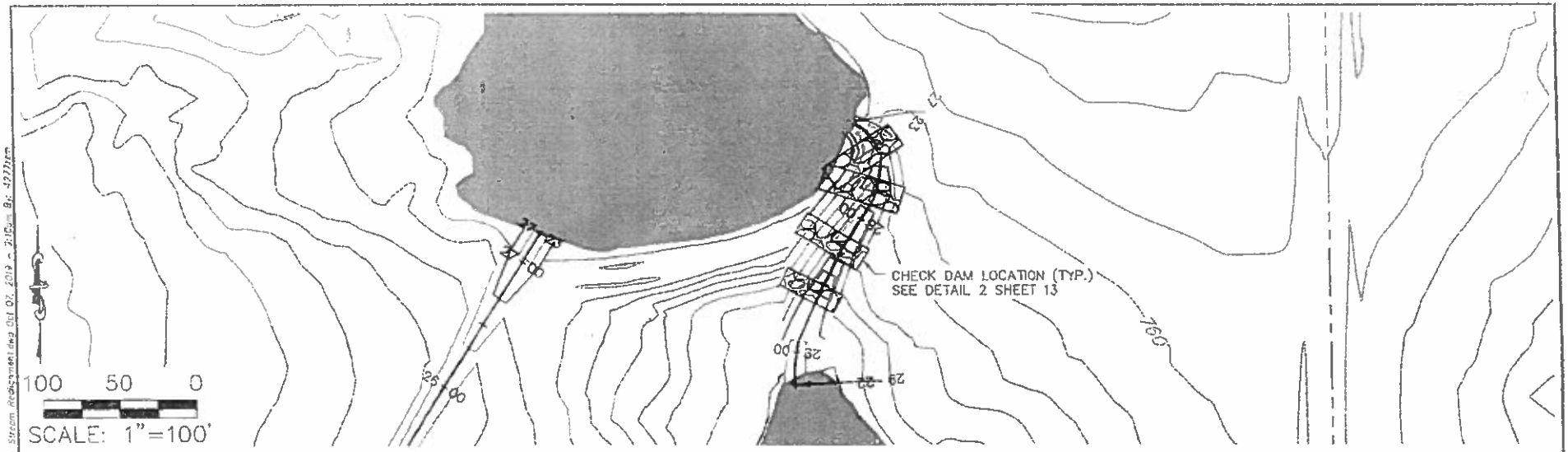
PROJ. NO.	DSN. BY:	Q/A REVIEW BY:
27219016.00	ZEM	VW
DSN. BY:	CHK. BY:	PROJ. MGR:
ZEM	UDP	VW

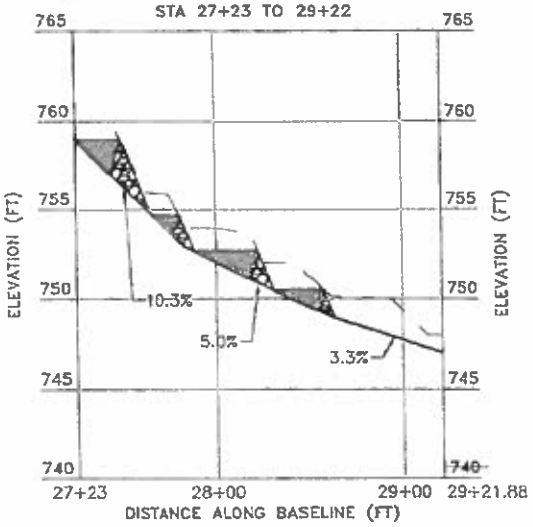
CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

SHEET TITLE:
PROPOSED REALIGNMENT (19+00 TO 27+23)

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 10/7/19
SCALE: SCALE
DRAWING NO. 11 of 13





PROFILE SCALE
HORIZ: 1" = 100'
VERT: 1" = 10'

LEGEND

- 2' EXISTING CONTOUR
- 10' EXISTING CONTOUR
- 2' DESIGN CONTOUR
- 10' DESIGN CONTOUR
- EXISTING PROFILE
- DESIGN PROFILE
- EXISTING PRODUCT LINE
- WETLAND
- TRANSITIONAL WETLAND
- POND
- CHECK DAM

NOTES:

1. EXISTING TOPOGRAPHY SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 7, 2018.
2. EXISTING PRODUCT LINE FROM SURVEY PROVIDED BY PROFESSIONAL SURVEYING, INC. OF TULSA, OKLAHOMA, DATED MARCH 22, 2019.
3. EXISTING WETLANDS AND PONDS LOCATED USING NATIONAL WETLANDS INVENTORY MAP AND SITE VISITS PERFORMED BY SCS ENGINEERS.
4. EXISTING PRODUCT LINE TO BE RELOCATED A MINIMUM OF 5 FT BELOW STREAM CHANNEL DURING CONSTRUCTION.
5. WETLANDS MARKED AS TRANSITIONAL ARE AREAS THAT WILL FLOOD DURING FLOWS GREATER THAN THE 25 YR STORM EVENT.
5. LARGE BOULDERS MAY BE PLACED WITHIN AND/OR ALONG THE CHANNEL EDGE IN THE FLATTER REACHES FOR ENHANCED INSTREAM HABITAT AND INCREASED CHANNEL STABILITY.
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THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON OCTOBER 7, 2019. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

SCS ENGINEERS
8575 WEST 110TH ST. SUITE 100
OVERLAND PARK, KS 66210
PH. (913) 681-0030 FAX. (913) 681-0012

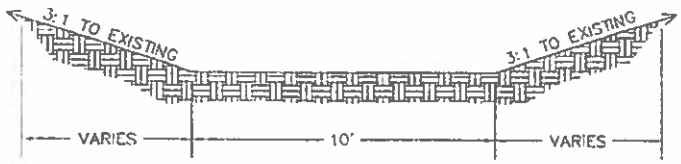
PROJ. NO.	DSN. BY	D/A RVL BY
27219016.00	ZEM	VW
CHK. BY	CHK. BY	PROJ. MGR.
ZEV	VPP	WM

CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

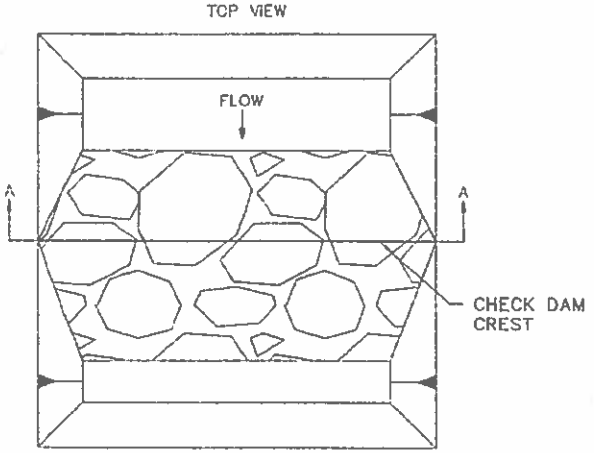
SHEET TITLE:
PROPOSED REALIGNMENT (27+23 TO 29+22)

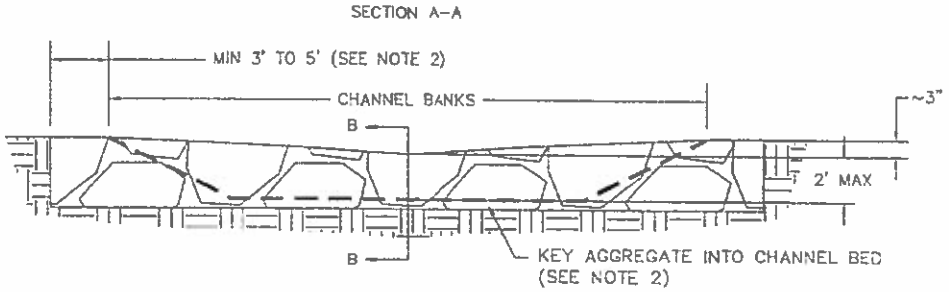
PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

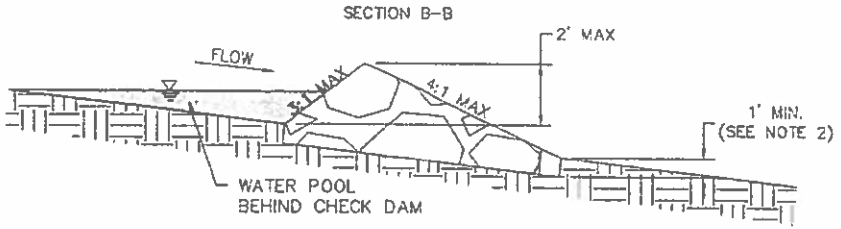
DATE: 10/7/19
SCALE: SCALE
DRAWING NO. 12 of 13

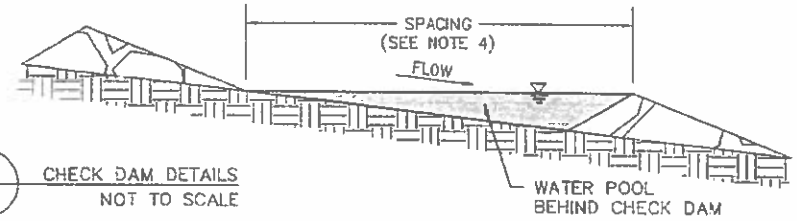


1 DESIGN CHANNEL CROSS SECTION
NOT TO SCALE









2 CHECK DAM DETAILS
NOT TO SCALE

NOTES:
1. CHECK DAMS SHALL BE CONSTRUCTED OF NATIVE AGGREGATE HAVING A D_{50} EQUAL TO OR GREATER THAN 9 INCHES.
2. AGGREGATE FOR CHECK DAMS SHALL BE KEYED INTO CHANNEL BANKS A MINIMUM OF 3 FEET ON STRAIGHT SECTIONS AND INSIDE CURVES, A MINIMUM OF 5 FEET ON OUTSIDE CURVES, AND A MINIMUM OF 1 FOOT INTO THE CHANNEL BED TO REDUCE LIKELIHOOD OF BYPASS FLOW AND EXCESSIVE SCOUR.
3. CHECK DAMS SHALL BE CONSTRUCTED WITH THE LOWEST POINT LOCATED AT THE CHANNEL CENTERLINE TO DIRECT FLOW INTO THE CENTER OF THE CHANNEL.
4. CHECK DAMS SHALL BE SPACED SUCH THAT THE CREST OF THE DOWNSTREAM DAM IS APPROXIMATELY LEVEL WITH THE LOWEST ELEVATION OF THE UPSTREAM DAM.

THIS DRAWING IS PART OF A BOUND SET SEALED BY FLOYD COTTER, A LICENSED PROFESSIONAL ENGINEER, ON OCTOBER 7, 2019. SEE COVER PAGE FOR PROFESSIONAL ENGINEERS SEAL.

SCS ENGINEERS
8575 WEST 110TH ST., SUITE 100
OVERLAND PARK, KS 66210
PH: (913) 681-0030 FAX: (913) 681-0012

PROJ. NO.	DES. BY	D/A REV. BY
27219016.00	ZEM	VW
DRN. BY	CHK. BY	PROJ. MGR.
ZEM	MPP	WM

CLIENT:
AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

SHEET TITLE:
DETAILS

PROJECT TITLE:
PROPOSED EXPANSION AND STREAM MITIGATION DESIGN

DATE: 10/7/19
SCALE: SCALE
DRAWING NO. 13 of 13

Oklahoma Department of Environmental Quality
404 Permit Approval

Scott Thompson
Executive Director

Kevin Stitt
Governor

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

March 31, 2020

Mr. Todd Green
American Environmental Landfill (AEL)
1420 W 35th Street
Tulsa 74107

RE: Application No. SWT-2017-339

Dear Mr. Green,

The Oklahoma Department of Environmental Quality (DEQ) has received your request for a Water Quality Certification under Section 401 of the Federal Clean Water Act [33 U.S.C. §1251 et seq. (1972)], for activities in an unnamed tributary to the Arkansas River to be permitted under Section 404 of the Act. DEQ rules governing 401 Water Quality Certification are contained in Oklahoma Administrative Code (O.A.C.) § 252:611-3 (2011) pursuant to 27A O.S. § 2-6-103(C)(2) (OSCN 1999). DEQ rules and regulations related to the 401 procedures are available at www.deq.state.ok.us/rules/611.pdf or through contacting the DEQ Office of External Affairs at (800) 869-1400.

We have reviewed and examined the proposed project as described in Public Notice No. SWT-2017-339 and your application documents. The unnamed tributary of the Arkansas River is assigned the following default beneficial uses in the Oklahoma Water Quality Standards (WQS): Warm Water Aquatic Community, Agriculture: Livestock and Irrigation, Primary Body Contact Recreation, and Aesthetics (OAC 785:45-5-3). The current Oklahoma WQS are available from the Oklahoma Water Resources Board at: http://www.owrb.ok.gov/util/rules/pdf_rul/RulesCurrent2011/Ch45-Current2011.pdf.

The purpose of the project is to expand a landfill. The project will include placement of 396 cubic yards of compacted grey clay and HDPE geomembrane into approximately 4,517 lf of the ephemeral stream. The filling will be done as part of the landfill foundation and liner system development. To offset the unavoidable impact to aquatic resources the applicant is proposing to create 2,920 lf stream flowing from west to the east into Shell Creek (a tributary to the Arkansas River). The constructed channel would be sinuous in nature, and will have built-in erosional protection features and will connect existing non-jurisdictional features with jurisdictional waters. In addition to the constructed channel, 1,283 feet of riparian corridor will be planted along the mitigation channel. To compensate for the remaining length of the impacted stream, out-of-kind preservation of 1.85 acres of existing wetlands and ponds is proposed. The constructed mitigation channels and connected hydric features will have a deed restriction placed on them. This deed restriction will be in-perpetuity protecting these features from future development.

The project is located on the unnamed tributary of the Arkansas River in Section 36, Township 20 North, Range 10 East, in Osage County, Oklahoma. The project site can be found on Wekiwa Oklahoma 7.5 Minute USGS Quadrangle map.

The conditions attached to this conditional Certification will be terms of the 404 permit. The state may require compliance with these conditions under state and/or federal law. Failure to comply with the conditions or any other applicable state requirements may result in proceedings brought by the state for the suspension, termination, modification or revocation of this Certification and/or for injunctive relief, damages and/or penalties as allowed by law. This Certification may be revoked or modified upon subsequent amendments or revisions to Oklahoma's Water Quality Standards requirements or upon expiration of the federal permit for the described activity.

This conditioned Water Quality Certification does not supersede the requirements of a Section 404 permit from the U.S. Army Corps of Engineers, a permit required by the local floodplain board, or any other permit required for this project. This certification does not authorize the discharge of industrial stormwater discharges, stormwater runoff from construction sites, or municipal/domestic wastewater discharges.

The certification is granted subject to the following conditions:

1) All spills of fuel or other pollutants in excess of five gallons shall be reported to the DEQ, within twenty-four (24) hours, to the pollution prevention hotline at 1-800-522-0206.
2) All fueling and servicing of vehicles and equipment shall be done above the Ordinary High Water Mark (OHWM).
3) Permittees shall provide access to the property to the DEQ for inspection purposes.
4) Any material and fuels used in the project shall be stored and/or stockpiled above the Ordinary High Water Mark (OHWM) and shall be removed from a likely flood zone prior to any predicted flood.
5) Environmental control practices, including but not limited to, effective erosion control measures and sediment control measures, shall be utilized during construction.
6) All construction shall be done in a manner that will minimize increased turbidity and prevent downstream deposition of bank material during or after construction.
7) Work in a stream channel shall be limited to periods of low flow, when practicable, and with the minimum amount of equipment.
8) Appropriate procedures shall be utilized during the construction of this project to prevent the release of construction debris, fuels and lubricants, or other deleterious materials.
9) All excess fill material, waste materials, construction debris, etc., must be removed from the site upon completion of the project.

If you have any questions concerning this matter, please contact Elena Jigoulina at 405-702-8200.

Sincerely,

Joe A. Long, Environmental Programs Manager
Watershed Planning Section
Water Quality Division

cc: Marcus Ware, Regulatory Branch, U.S. Army Corps of Engineers, Tulsa
Barry Bolton, Fisheries Chief, Oklahoma Department of Wildlife Conservation

Bill Cauthron, Chief, Water Quality Programs Division, Oklahoma Water Resources Board
Brooks Tramell, Monitoring, Assessment and Wetlands Programs, Oklahoma Conservation Commission
Daniel Landeros, EPA Region 6 (6WQ-EM)
Jennifer Lewis, Assistant Attorney General, Conservation Unit, OK, Office of the Attorney General

corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE) 10.23.20
(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

29 October 2020

(DISTRICT ENGINEER) Scott S. Preston
Colonel, U.S. Army
District Commander
(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE)

(DATE)

PERMITTEE CONSTRUCTION SCHEDULE

* MAIL TO ADDRESS WITHIN 30 DAYS OF "DATE OF ISSUANCE"

Mail or E-mail to ceswt-ro@usace.army.mil to:

U.S. Army Corps of Engineers
CESWT-RO
2488 E. 81st Street
Tulsa, OK 74137-4290

PERMIT NO.: SWT-2017-00339

USACE PROJECT MANAGER: Mr. Marcus Ware

PERMITTEE NAME: Mr. Todd Green, AEL

ODOT **DATE OF ISSUANCE:** October 22, 2020

----------(fold here so that address shows on outside)--------

Please provide the following information.

Anticipated/Known Construction Start Date: 11-1-20

Anticipated Completion Date: 11-1-2022

I have read and understand the obligations and requirements of this authorization.

SIGNATURE: _____ **DATE:** 10/24/20

PERMITTEE: Mr. Todd Green, AEL

----------(fold here and tape closed)----------

(FOR AGENCY USE ONLY - DO NOT WRITE BELOW THIS LINE)

PROJECT MANAGER: _____

RECEIVED IN CESWT-RO: _____

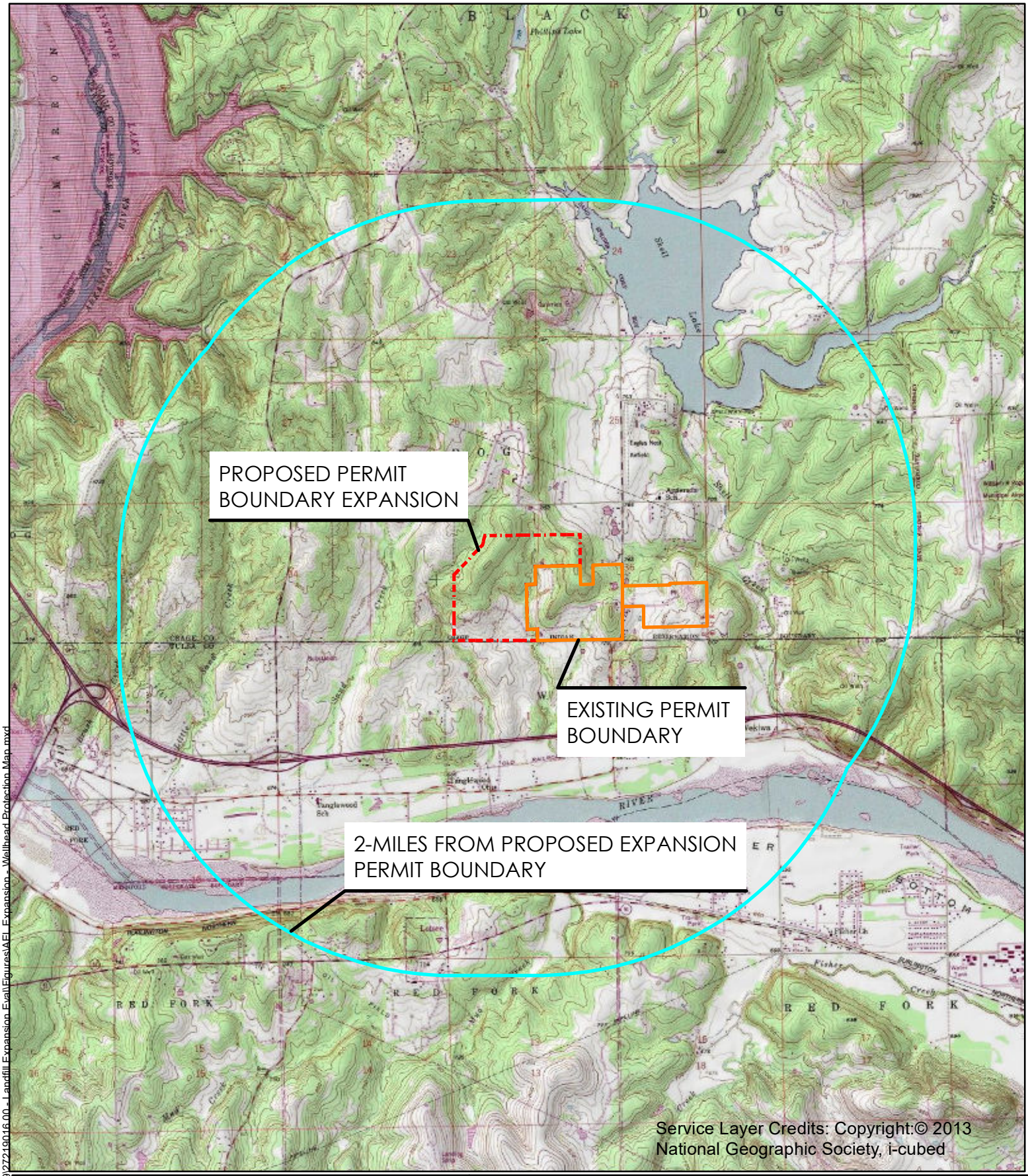
INSPECTION NEEDED: Y / N

CONSTRUCTION INSPECTION SCHEDULED: _____

FINAL INSPECTION SCHEDULED: _____

COUNTY: OSAGE

Oklahoma Department of Environmental Quality
Wellhead Protection Area



Legend

- Public Water Supply Well
- Existing Permit Boundary
- Proposed Expanded Permit Boundary
- 2-miles from Proposed Expansion Permit Boundary

FIGURE 2
AMERICAN ENVIRONMENTAL LANDFILL EXPANSION
WELLHEAD PROTECTION MAP
OSAGE COUNTY, OKLAHOMA

SCS ENGINEERS

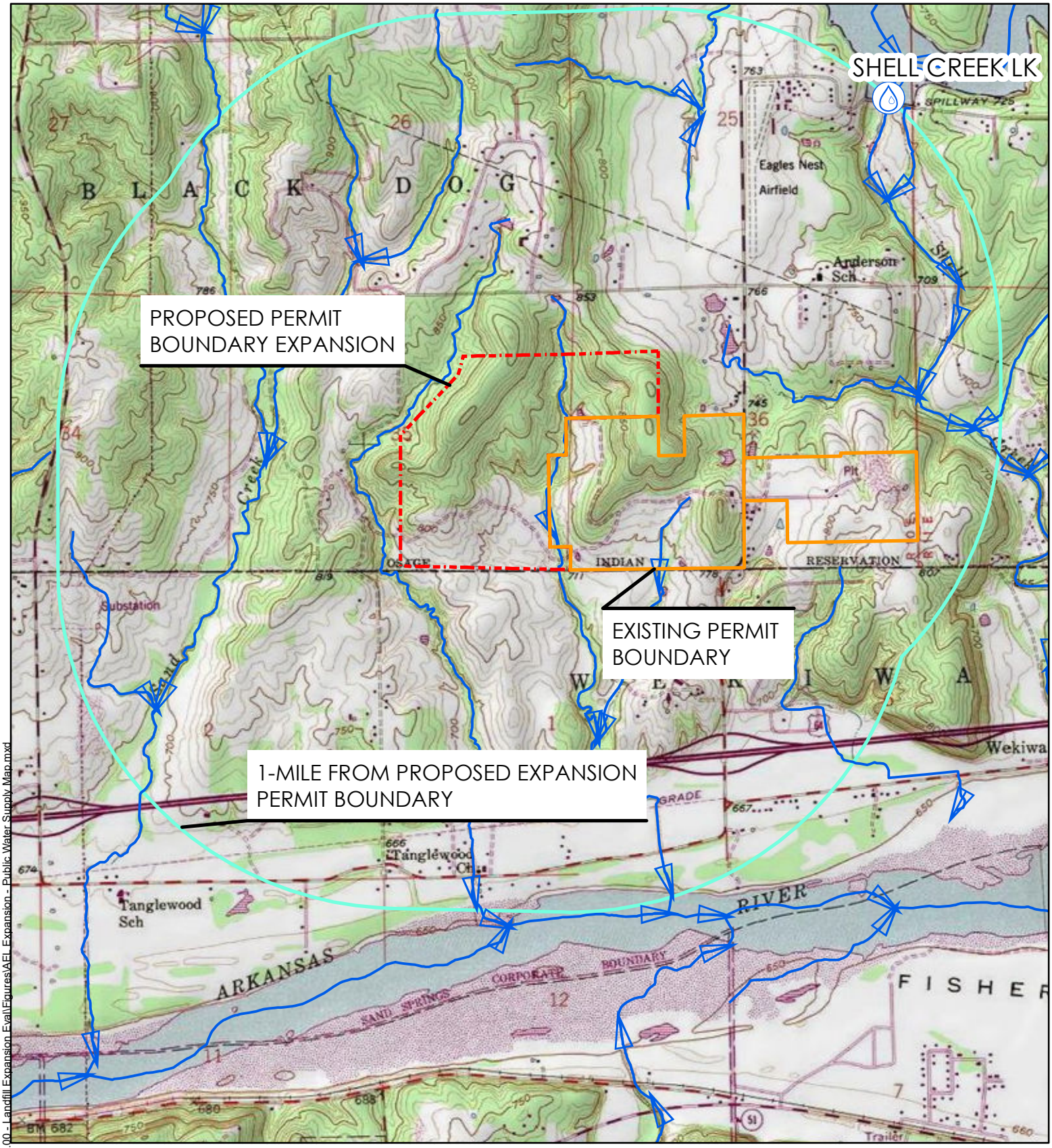
Yukon, OK | May 2020

0 2,000 4,000 Feet

N

Document Path: K:\AEL\Projects\2019\27219016.00 - Landfill Expansion Eval\Figures\AEL Expansion - Wellhead Protection Map.mxd

Oklahoma Water Resources Board



Layer Information from OWRB Open Data website. For flowlines, OWRB credits USGS and the National Hydrography Dataset (NHD). Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

Legend

- Public Water Supply Surface Water Intake
- Public Water Supply Well
- Existing Permit Boundary
- Proposed Expanded Permit Boundary
- NHDFlowline
- 1-Mile from Proposed Expansion Permit Boundary

FIGURE 7
AMERICAN ENVIRONMENTAL LANDFILL EXPANSION
PUBLIC WATER SUPPLY LOCATIONS
OSAGE COUNTY, OKLAHOMA

SCS ENGINEERS

Yukon, OK | May 2020

0 1,000 2,000 Feet

N

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Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevation (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum (NAVD). Users of this FIRM should be aware that coastal flood elevations may also be provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.6 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map is Universal Transverse Mercator (UTM) zone 14. The **horizontal datum** is NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Special Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3242

To obtain current elevation, description, and/or location information for **benchmarks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the USDASX (Corporation for the National Agricultural Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2005 or later.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

An accompanying Flood Insurance Study report, Letters of Map Revision or Letters of Map Amendment revising portions of this panel, and digital versions of this PANEL may be available. Contact the **FEMA Map Service Center** at the following phone numbers and Internet address for information on all related products available from FEMA:

Phone: 800-358-9616
FAX: 800-358-9620
http://msc.fema.gov/

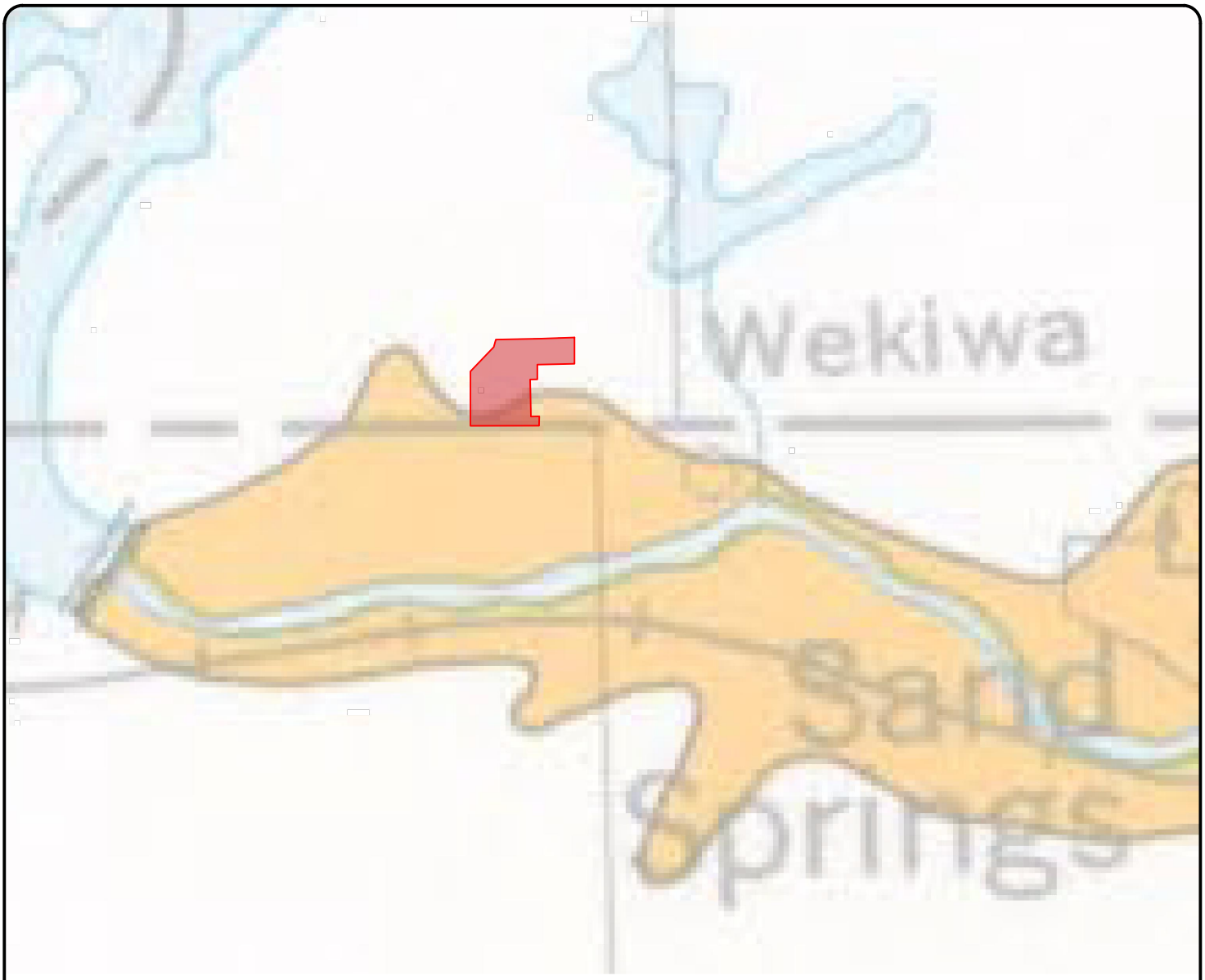
If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on this map.

Approximate AEL Permit Boundary

JOSAGE PANEL 0305
KEYSTONE RESERVOIR
KEYSTONE RESERVOIR
ZONE A
ZONE AE
ZONE X
ZONE AE
ZONE AE
ZONE AE
ZONE AE
ZONE AE
ZONE X
ZONE AE
ZONE AE
ZONE AE
ZONE AE
ZONE AE

Oklahoma Geologic Survey



APPROXIMATE PROPOSED PERMIT BOUNDARY

TERRACE AND ALLUVIAL DEPOSITS AND THEIR RECHARGE AREAS

NOTE:
1. MAP FROM "MAP OF AQUIFERS AND RECHARGE AREAS IN OKLAHOMA" COMPILED BY KENNETH S. JOHNSON, OKLAHOMA GEOLOGICAL SURVEY (1991).

6,000 0 6,000 12,000

SCALE FEET

N

SCS ENGINEERS

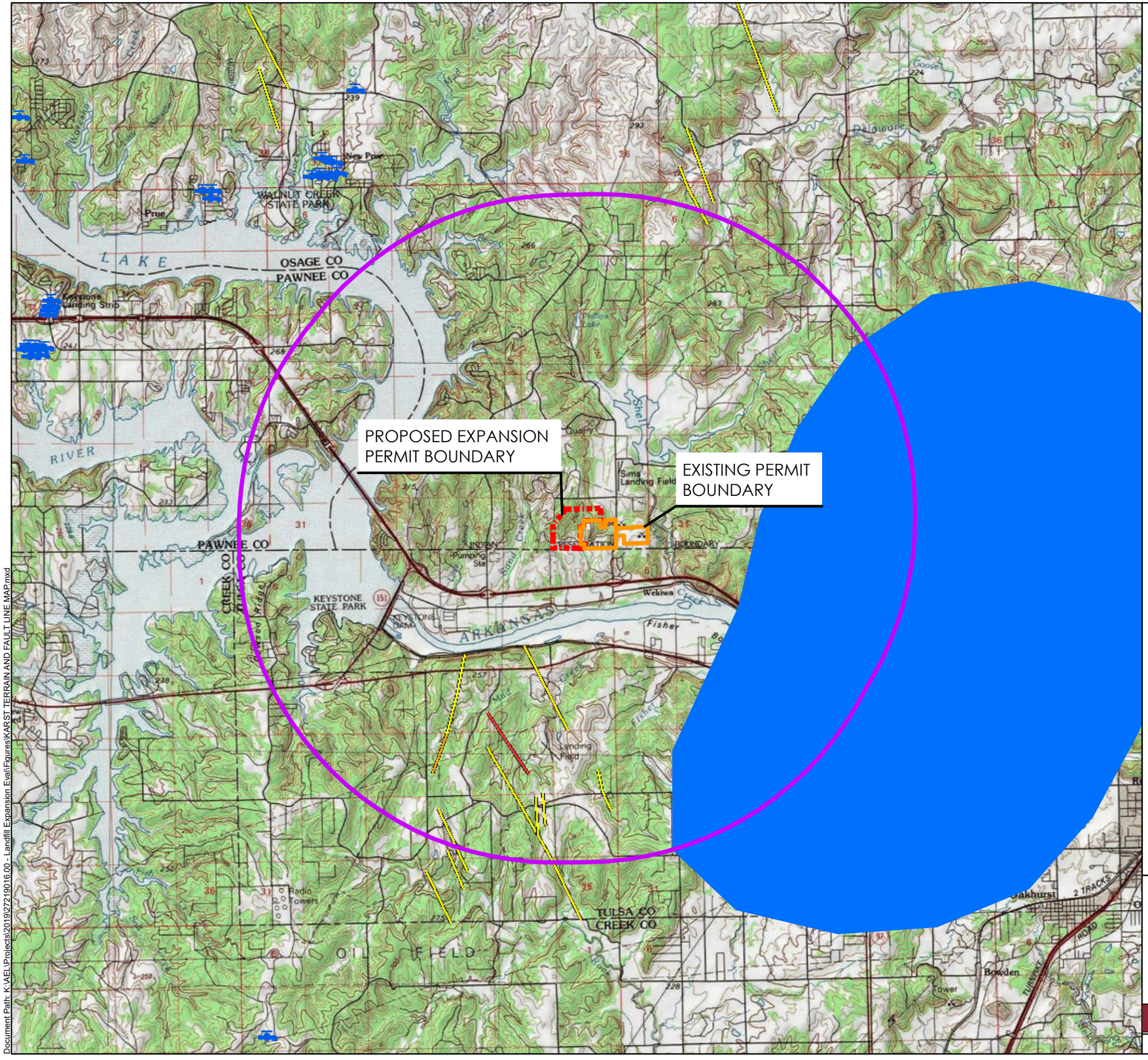
1817 Commons Cir #1
Yukon, Ok. 73099
Tel: +1-405-265-3960

American Environmental Landfill Inc.

American Environmental Landfill

Sand Springs, Ok.

CHK. BY: S.R.	DWN. BY: T.L.	DSN. BY: T.L.	PROJ. NO. 27220345.00
PROJ. MGR: W.M.	DATE: 3/6/20	CADD FILE: AQUIFER MAP.DWG	DRAWING NO. 1



Legend

- Public Water Supply Well
- Existing Permit Boundary
- Proposed Expanded Permit Boundary

Karst Type

- Carbonate
- Erosional
- Gypsum
- Volcanic

Oklahoma Earthquakes (2009-2019)

- ≤2.5
- ≤3.0
- ≤3.5
- ≤4.0
- ≤4.5
- ≤6.0

Fault Lines

Fault Orientation (Azimuth)

- Optimal — *Optimal (45°-60°, 105°-120° and 135°-150°)*
- Moderately Optimal — *Moderately Optimal (15°-45°, 60°-75°, 90°-105° and 120°-135°)*
- Sub-Optimal — *Sub-Optimal (0°-15°, 75°-90° and 150°-180°)*

FIGURE 4
AEL - DRILLING PLAN
KARST TERRAIN AND FAULT LINE MAP
OSAGE COUNTY, OKLAHOMA

SCS ENGINEERS | Yukon, OK | June 2020

0 4,000 8,000 Feet

N

Document Path: K:\AEL\Projects\20192721901 6.00 - Landfill Expansion Eval\Figures\KARST TERRAIN AND FAULT LINE MAP.mxd

Oklahoma Department of Mines

June 2, 2020
File No. 27219016.00

Mr. Mike Lewis, Geologist
Oklahoma Department of Mines
2915 N. Classen Blvd., Suite 213
Oklahoma City, OK 73106-5406

Subject: American Environmental Landfill
Proposed Landfill Expansion Notification
ODEQ Permit No. 3557021

Dear Mr. Lewis:

As required by Oklahoma Department of Environmental Quality (ODEQ) Oklahoma Administrative Code 252:515-5-52(d), SCS Engineers is requesting a determination for the proposed expansion of the American Environmental Landfill which is owned and operated by American Environmental Landfill, Inc. (AEL). The proposed landfill expansion consists of approximately 203 acres and is located at 207 North 177th West Avenue, Sand Springs, Oklahoma 74063. Two general site location maps are enclosed.

The ODEQ regulation states the following: *No new waste management or disposal areas of a land disposal facility shall be located over a subsurface mining area or any other unstable area.*

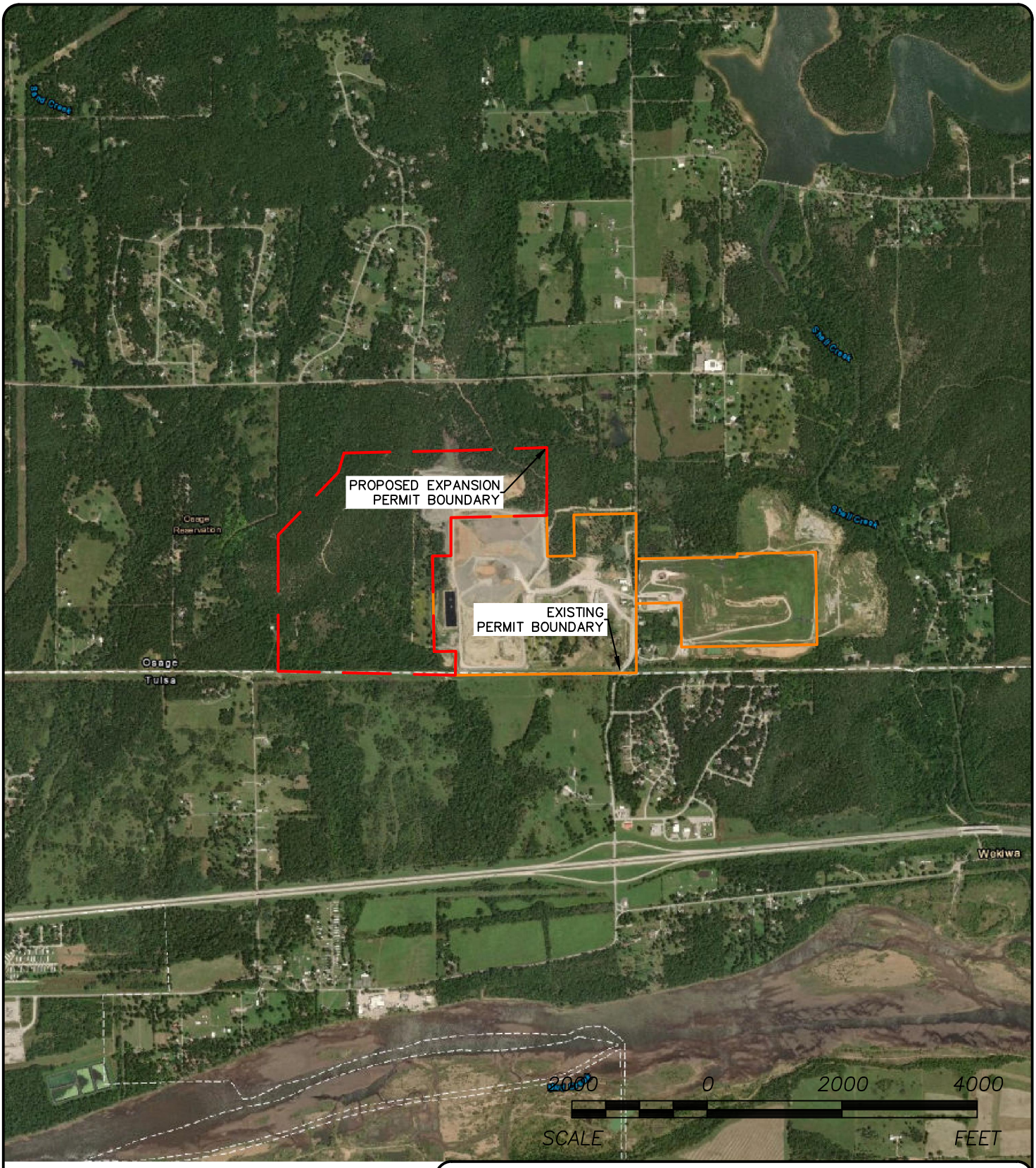
On behalf of our client, we request you review the enclosed maps and provide this determination as required by the ODEQ within 45 days of receipt of this letter. If you have any questions or comments or need additional information, please do not hesitate to contact the undersigned at (405) 246-1574. Thank you very much for your time and effort in this matter.

Sincerely,

Sarah Rafalowski, PE
Senior Project Professional
SCS Engineers

Wade Miller
Project Director
SCS Engineers

Encl. 2 General Site Location Maps



LEGEND

EXISTING PERMIT BOUNDARY

PROPOSED EXPANSION PERMIT BOUNDARY

Aerial Image Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

N

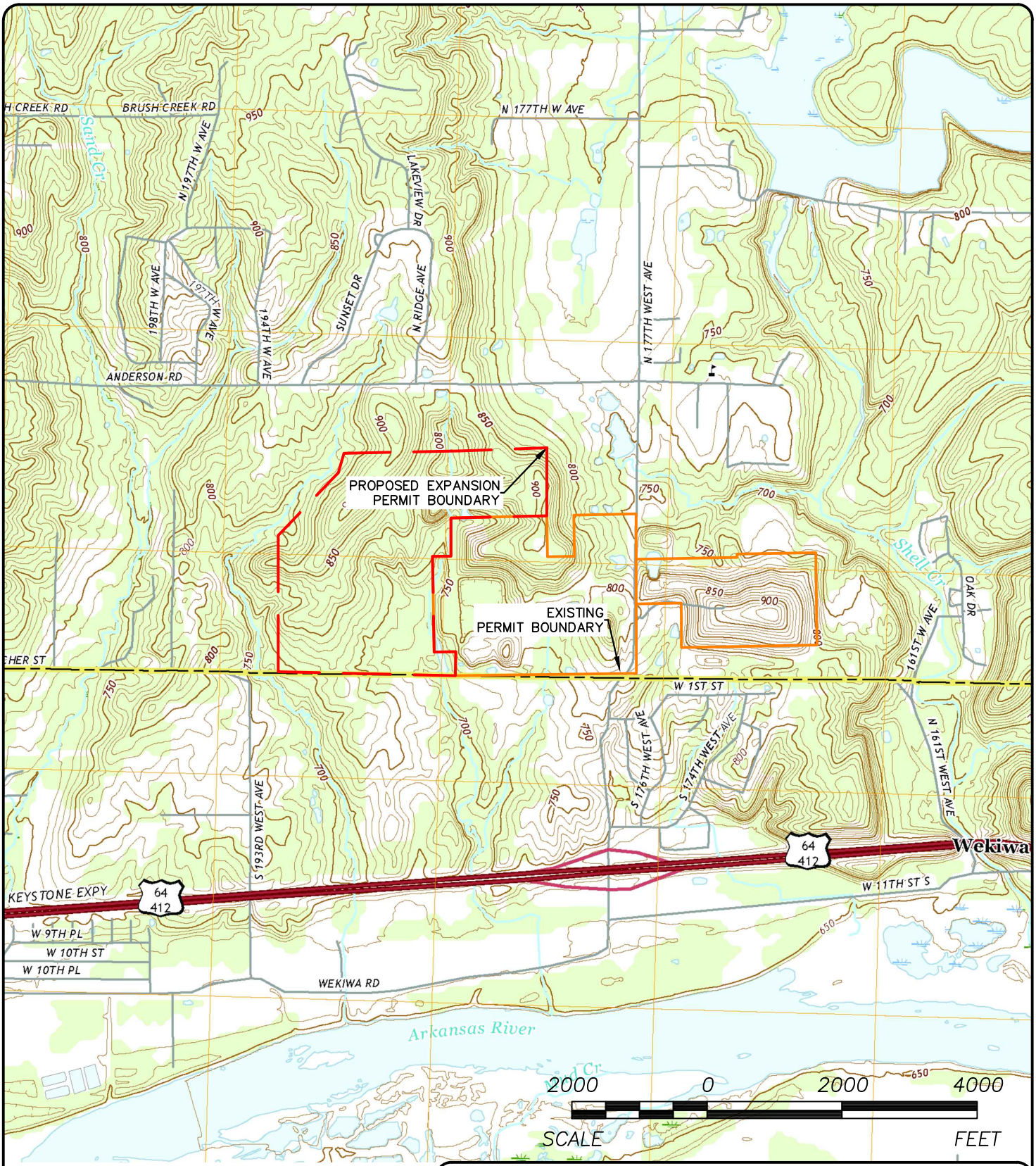
SCS ENGINEERS

STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
1817 COMMONS CIRCLE, SUITE 1
YUKON, OKLAHOMA 73099
PH. (405) 265-3960

AMERICAN ENVIRONMENTAL LANDFILL, INC.

SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/28/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 1



LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED EXPANSION PERMIT BOUNDARY

NOTE:
MAP AND CONTOURS SHOWN ARE FROM THE USGS 7.5' SERIES WEKIWA QUADRANGLE IN OSAGE AND TULSA COUNTIES, OKLAHOMA DATED 2018.

N

SCS ENGINEERS

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PH. (405) 265-3960

AMERICAN ENVIRONMENTAL LANDFILL, INC.
SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/26/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 2

MARY ANN PRITCHARD
DIRECTOR

J. KEVIN STITT
GOVERNOR

STATE OF OKLAHOMA
DEPARTMENT OF MINES

July 8, 2020

Ms. Sarah Rafalowski
Senior Project Professional
SCS Engineers
1817 Commons Circle, Suite 1
Yukon, OK 73099

Re: American Environmental Landfill
Proposed Landfill Expansion
Portions of S/2 NE/4 & SE/4 Section 35, T20N, R10E
SW/4 NW/4 Section 36, T20N, 10E
Osage County, Oklahoma

Dear Ms. Rafalowski:

The Oklahoma Department of Mines (ODM) received your request for information concerning the subject proposed expansion of the American Environmental Landfill project in Osage County, Oklahoma on June 5, 2020. As required by Oklahoma Department of Environmental Quality (ODEQ) Oklahoma Administrative Code 252:515-5-52(d) a determination is necessary for the proposed expansion. The ODEQ regulation states the following: No new waste management or disposal areas of a land disposal facility shall be located over a subsurface mining area or any other unstable area. After researching our current and historical data file, ODM did not find any coal, non-coal permits or any other surface reclamation efforts on record that might affect your project

If you have further questions or need clarification please contact me at (405) 522-9851.

Sincerely,

Mike Lewis
ODM Geologist, Technical Services

Cc: Rhonda Dossett, Coal Program Director, Stacy Woody, Coal Permit Officer-ODM

Oklahoma Corporation Commission

June 2, 2020
File No. 27219016.00

Ms. Brandy Wreath, Director
Public Utilities Division
Oklahoma Corporation Commission
P.O. Box 52000
Oklahoma City, OK 73152-2000

Subject: American Environmental Landfill
Proposed Landfill Expansion Notification
ODEQ Permit No. 3557021

Dear Ms. Wreath:

As required by Oklahoma Department of Environmental Quality (ODEQ) Oklahoma Administrative Code 252:515-5-52 (a), SCS Engineers is requesting a determination for the proposed expansion of the American Environmental Landfill which is owned and operated by American Environmental Landfill, Inc. (AEL). The proposed landfill expansion consists of approximately 203 acres and is located at 207 North 177th West Avenue, Sand Springs, Oklahoma 74063. Two general site location maps are enclosed.

The ODEQ regulation states the following: *A minimum horizontal separation of twenty-five feet (25') shall be maintained between all waste management and disposal areas of a land disposal facility and any above-ground or underground pipeline or transmission line. Information on the location and owners of all such lines and easements shall be provided to the DEQ.*

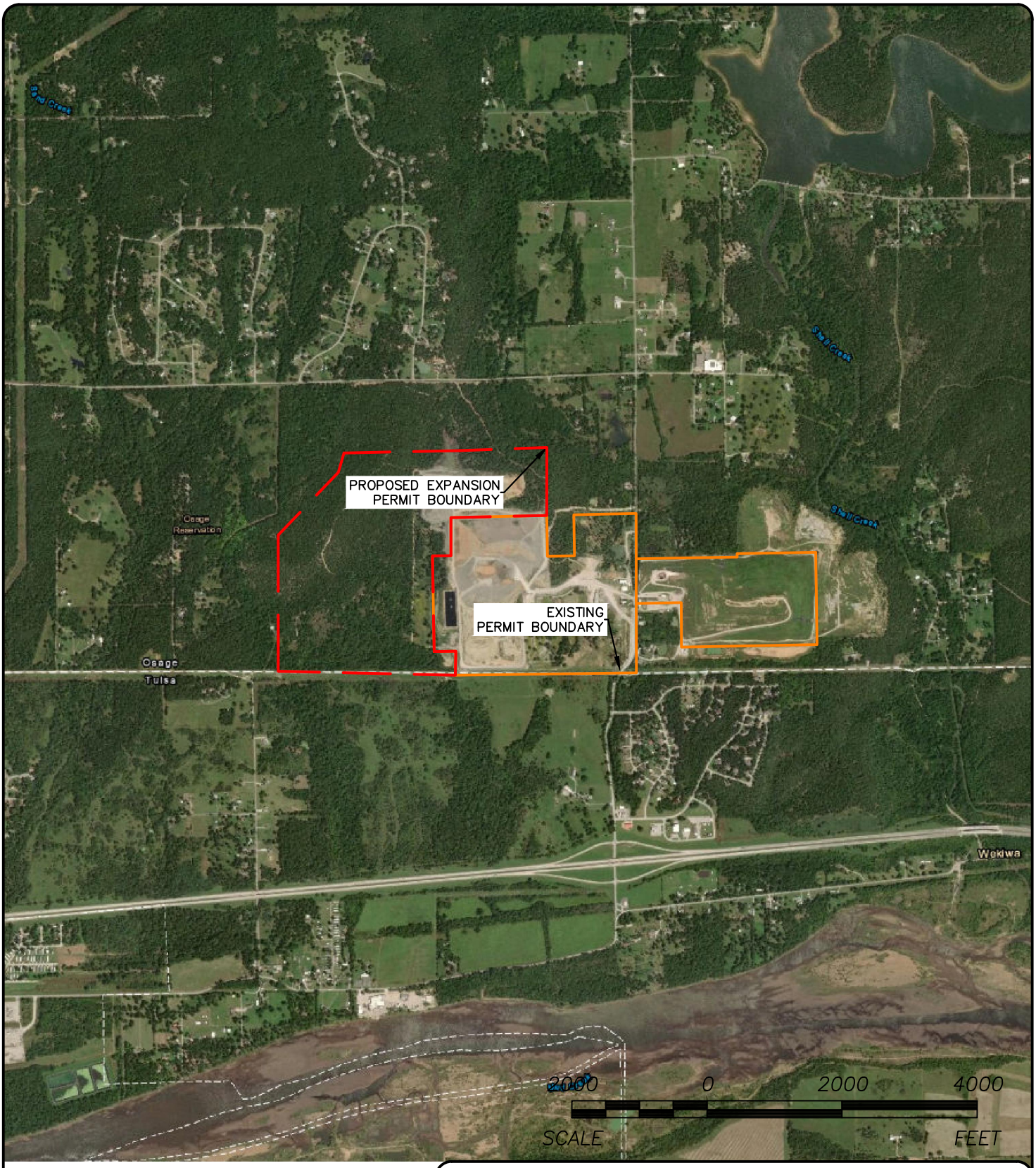
On behalf of our client, we request you review the enclosed maps and provide this determination as required by the ODEQ within 45 days of receipt of this letter. If you have any questions or comments or need additional information, please do not hesitate to contact the undersigned at (405) 246-1574. Thank you very much for your time and effort in this matter.

Sincerely,

Sarah Rafalowski, PE
Senior Project Professional
SCS Engineers

Wade Miller
Project Director
SCS Engineers

Encl. 2 General Site Location Maps



LEGEND

EXISTING PERMIT BOUNDARY

PROPOSED EXPANSION PERMIT BOUNDARY

Aerial Image Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

N

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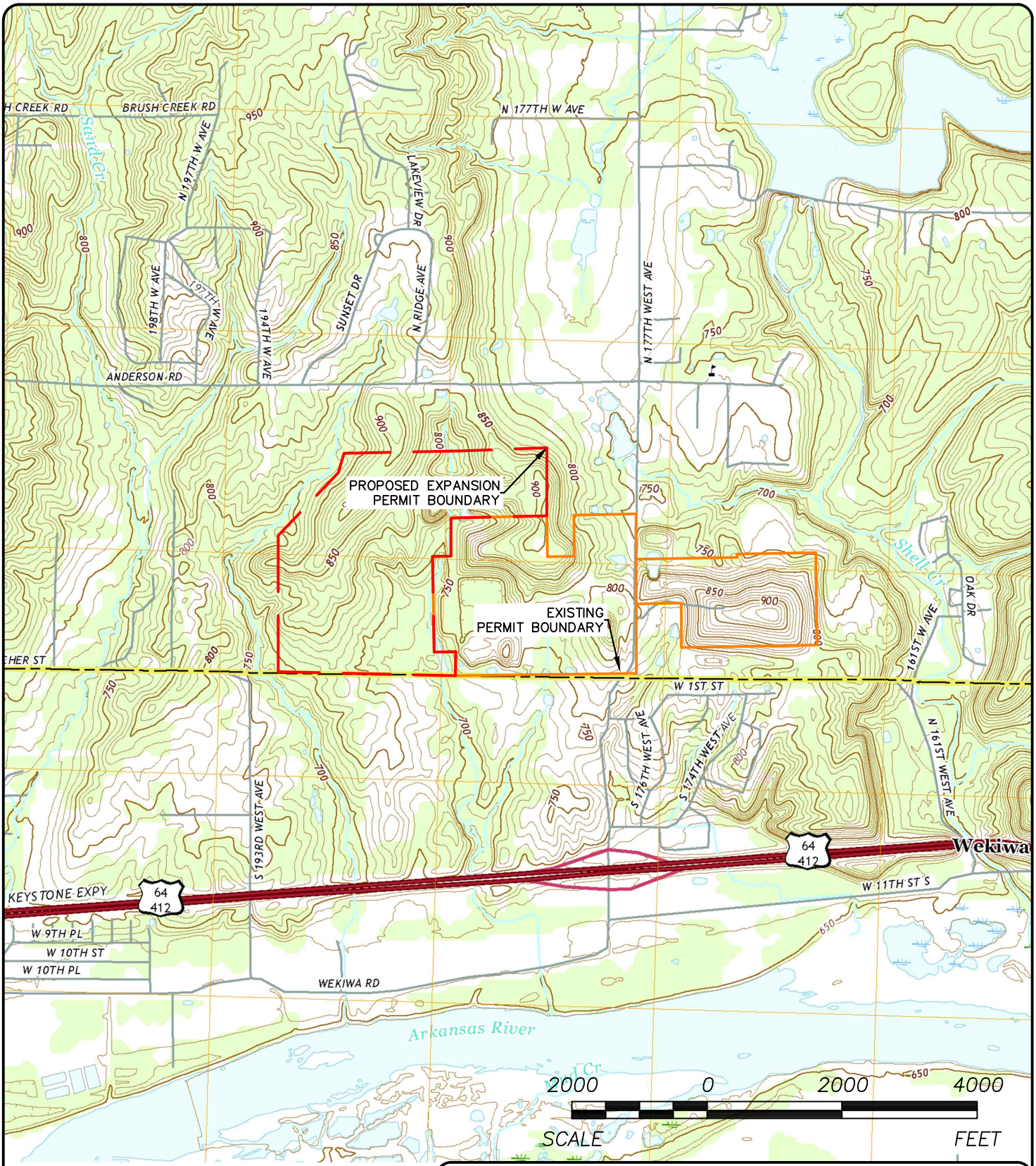
1817 COMMONS CIRCLE, SUITE 1
YUKON, OKLAHOMA 73099
PH. (405) 265-3960

AMERICAN ENVIRONMENTAL LANDFILL, INC.

SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/28/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 1



LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED EXPANSION PERMIT BOUNDARY

NOTE:
MAP AND CONTOURS SHOWN ARE FROM THE USGS 7.5' SERIES WEKIWA QUADRANGLE IN OSAGE AND TULSA COUNTIES, OKLAHOMA DATED 2018.

N

SCS ENGINEERS

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1817 COMMONS CIRCLE, SUITE 1
YUKON, OKLAHOMA 73099
PH. (405) 265-3960

AMERICAN ENVIRONMENTAL LANDFILL, INC.
SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/26/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 2

Pogue Airport

June 2, 2020
File No. 27219016.00

Mr. Ken Madison
Pogue Airport
3200 N. Airport Rd
Sand Springs, OK 74063

Subject: American Environmental Landfill
Proposed Landfill Expansion Notification
ODEQ Permit No. 3557021

Dear Mr. Madison:

As required by Oklahoma Department of Environmental Quality (ODEQ) Oklahoma Administrative Code 252:515-5-52(e), SCS Engineers is requesting a determination for the proposed expansion of the American Environmental Landfill which is owned and operated by American Environmental Landfill, Inc. (AEL). The proposed landfill expansion consists of approximately 203 acres and is located at 207 North 177th West Avenue, Sand Springs, Oklahoma 74063. Two general site location maps are enclosed.

The ODEQ regulation states the following: *if any waste management or disposal area of a new land disposal facility, or expansion of waste management or disposal areas of an existing land disposal facility, is to be located within 10,000 feet of any airport runway end used by turbojet aircraft or within 5,000 feet of any airport runway end used by only piston-type aircraft, a demonstration that the facility will not pose a bird hazard to aircraft shall be provided to the DEQ.*

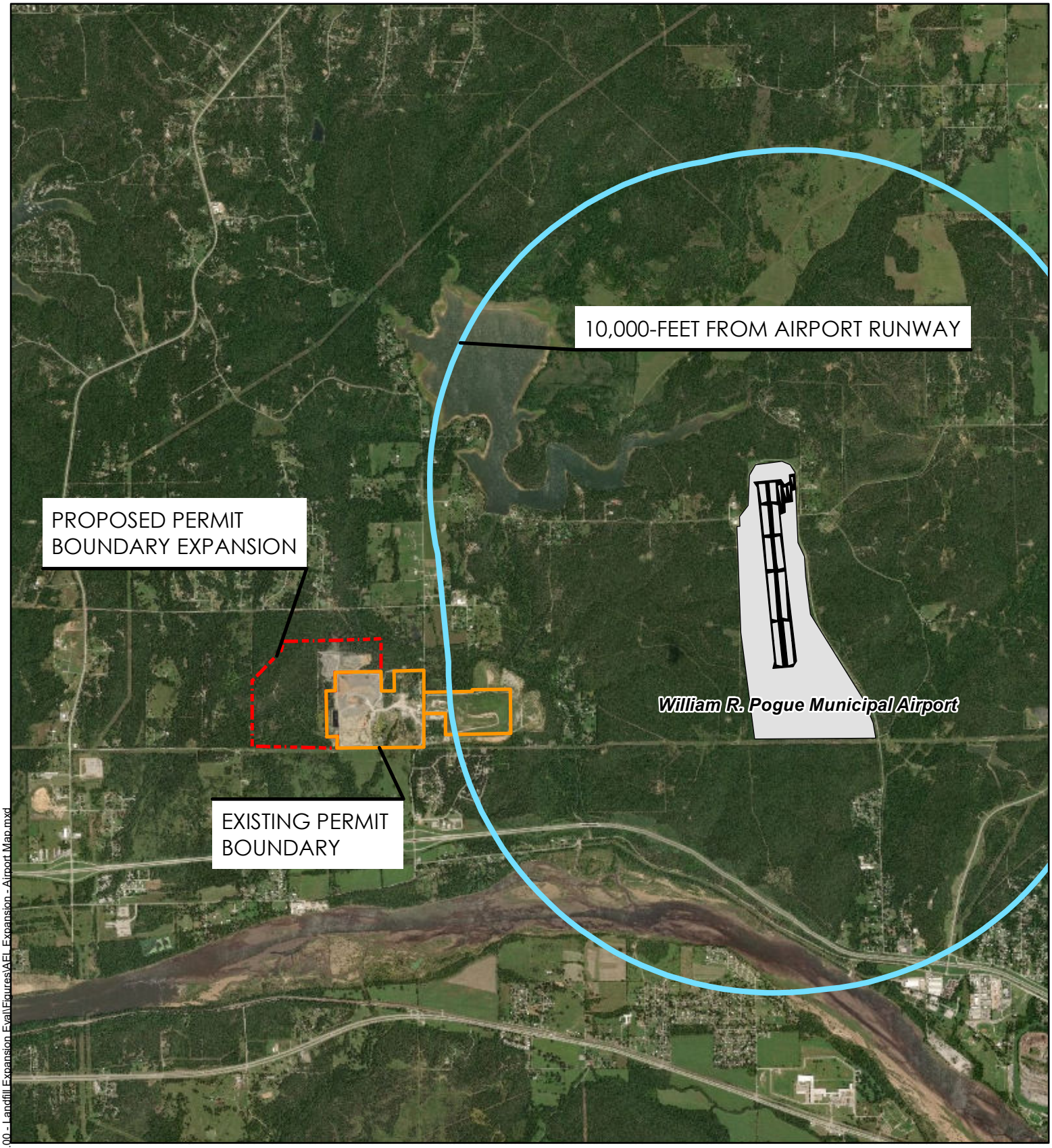
If any waste management or disposal areas of a new land disposal facility, or expansion of waste management or disposal areas of an active land disposal facility, will be located within a 5-mile radius of any airport runaway end used by turbojet or piston-type aircraft, the affected airport and the FAA must be notified and proof of such notification provided to the DEQ.

On behalf of our client, we request your review of the enclosed maps. Please advise us of any concerns that Pogue Airport may have with the proposed landfill expansion location within 45 days of receipt of this letter. If you have any questions or comments or need additional information, please do not hesitate to contact the undersigned at (405) 246-1574. Thank you very much for your time and effort in this matter.

Sincerely,

Sarah Rafalowski, PE
Senior Project Professional
SCS Engineers

Wade Miller
Project Director
SCS Engineers



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- 10,000 feet from Airport Runway
- Airport Area
- Airport Runway
- Existing Permit Boundary
- Proposed Expanded Permit Boundary

FIGURE 1
AMERICAN ENVIRONMENTAL LANDFILL EXPANSION
DISTANCE FROM AIRPORT RUNWAY
OSAGE COUNTY, OKLAHOMA

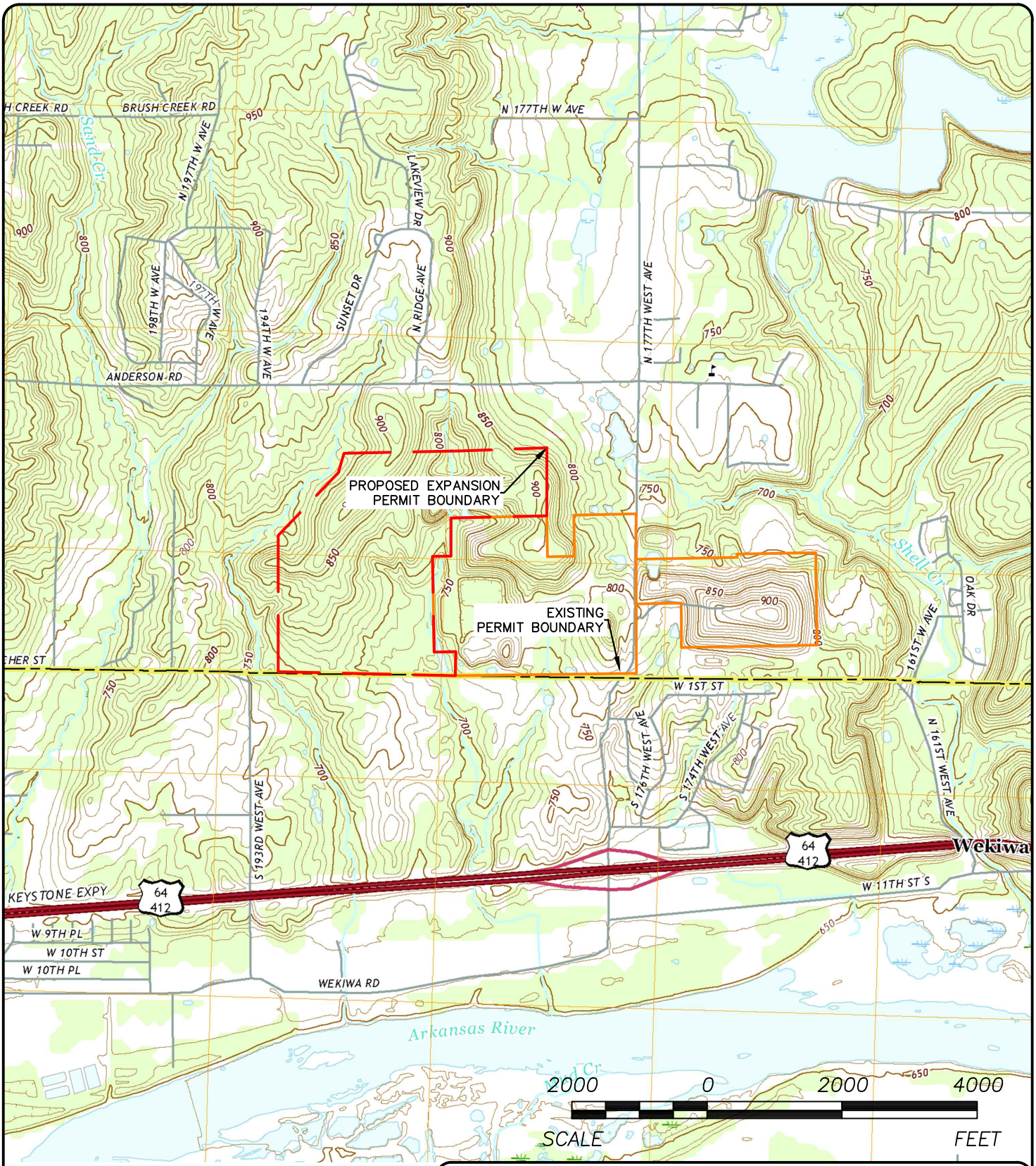
SCS ENGINEERS

Yukon, OK | May 2020

0 2,000 4,000 Feet

N

Document Path: K:\AEL\Projects\2019\27219016.00 - Landfill Expansion Eval\Figures\AEL Expansion - Airport Map.mxd



LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED EXPANSION PERMIT BOUNDARY

NOTE:
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N

SCS ENGINEERS

STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
1817 COMMONS CIRCLE, SUITE 1
YUKON, OKLAHOMA 73099
PH. (405) 265-3960

AMERICAN ENVIRONMENTAL LANDFILL, INC.
SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/26/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 2

Federal Aviation Administration

June 17, 2020
File No. 27219016.00

Mr. Glenn Boles
Oklahoma Airports District Office, ASW-630
Federal Aviation Administration - Southwest Region
10101 Hillwood Parkway
Fort Worth, TX 76177

Subject: American Environmental Landfill
Proposed Landfill Expansion Notification
ODEQ Permit No. 3557021

Dear Mr. Boles:

As required by Oklahoma Department of Environmental Quality (ODEQ) Oklahoma Administrative Code 252:515-5-52(e), SCS Engineers is requesting a determination for the proposed expansion of the American Environmental Landfill which is owned and operated by American Environmental Landfill, Inc. (AEL). The proposed landfill expansion consists of approximately 203 acres and is located at 207 North 177th West Avenue, Sand Springs, Oklahoma 74063. Two general site location maps are enclosed.

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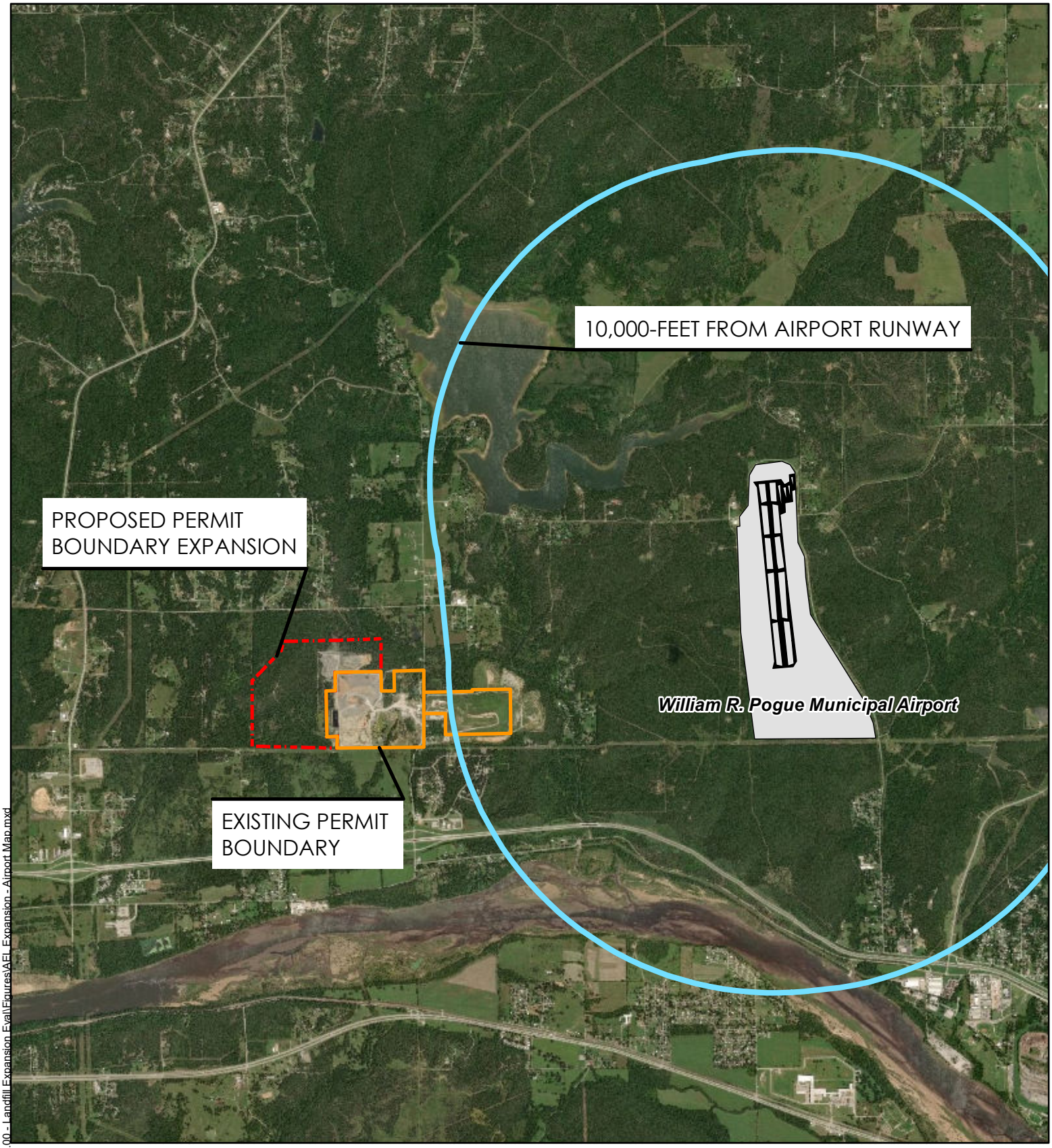
If any waste management or disposal areas of a new land disposal facility, or expansion of waste management or disposal areas of an active land disposal facility, will be located within a 5-mile radius of any airport runaway end used by turbojet or piston-type aircraft, the affected airport and the FAA must be notified and proof of such notification provided to the DEQ.

On behalf of our client, we request your review of the enclosed maps. Please advise us of any concerns the Federal Aviation Administration may have with the proposed landfill expansion location within 45 days of receipt of this letter. If you have any questions or comments or need additional information, please do not hesitate to contact the undersigned at (405) 246-3960. Thank you very much for your time and effort in this matter.

Sincerely,

Sarah Rafalowski, PE
Senior Project Professional
SCS Engineers

Wade Miller
Project Director
SCS Engineers



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- 10,000 feet from Airport Runway
- Airport Area
- Airport Runway
- Existing Permit Boundary
- Proposed Expanded Permit Boundary

FIGURE 1
AMERICAN ENVIRONMENTAL LANDFILL EXPANSION
DISTANCE FROM AIRPORT RUNWAY
OSAGE COUNTY, OKLAHOMA

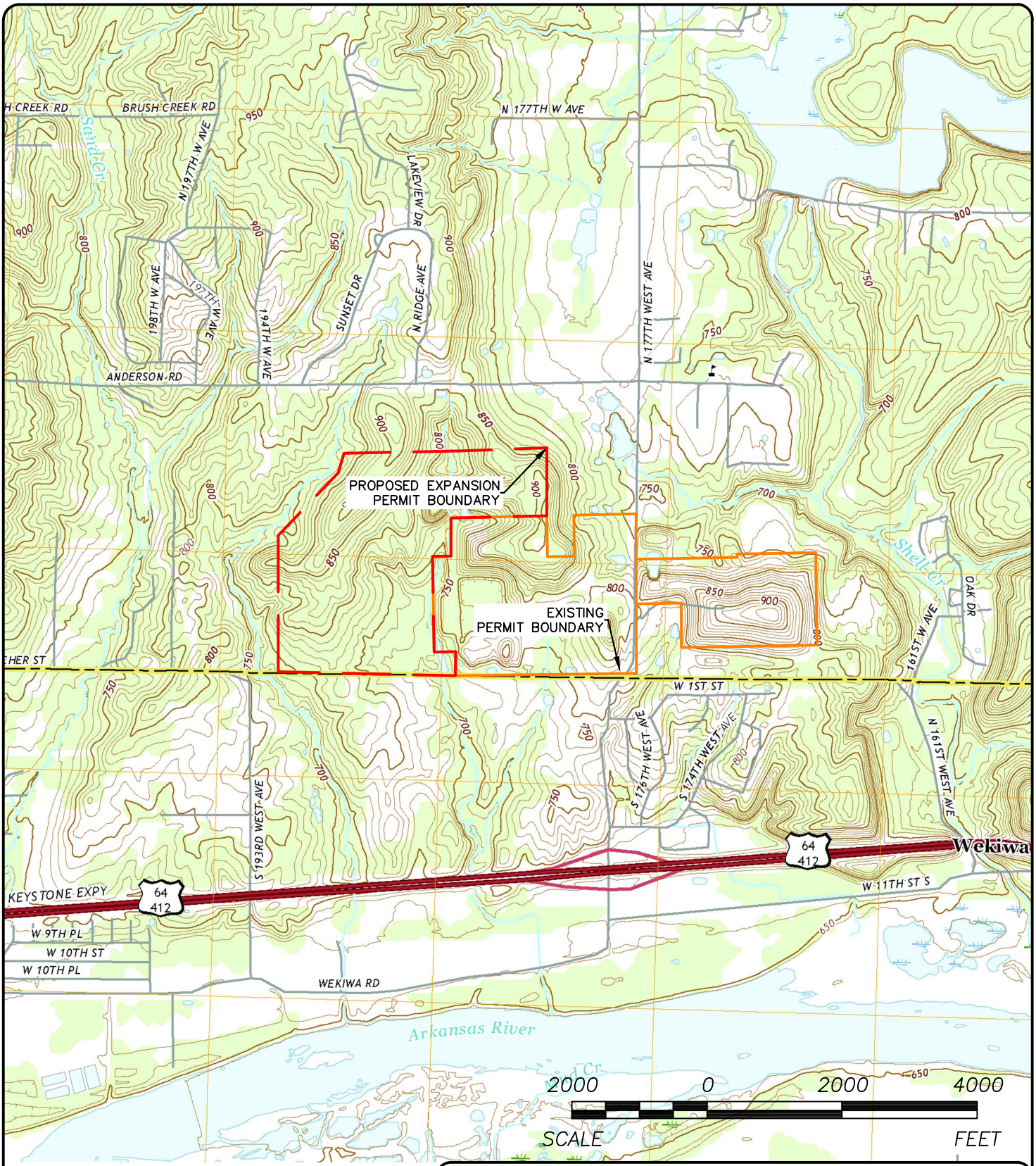
SCS ENGINEERS

Yukon, OK | May 2020

0 2,000 4,000 Feet

N

Document Path: K:\AEL\Projects\2019\27219016.00 - Landfill Expansion Eval\Figures\AEL Expansion - Airport Map.mxd



LEGEND

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N

SCS ENGINEERS

STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
1817 COMMONS CIRCLE, SUITE 1
YUKON, OKLAHOMA 73099
PH. (405) 265-3960

AMERICAN ENVIRONMENTAL LANDFILL, INC.
SAND SPRINGS, OKLAHOMA
OSAGE COUNTY

CHK. BY: WJM	DWN. BY: SAR	DSN. BY: SAR	PROJ. NO. 27219016.00
PROJ. MGR: WJM	DATE: 5/26/20	CADD FILE: SITE LOCATION MAP.DWG	DRAWING NO. 2

Certified Mail Receipts

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Matt Warren
Bureau of Reclamation
Oklahoma City Field Office
5924 NW 2nd Street, Suite 200
Oklahoma City, OK 73127

9590 9402 5425 9189 3448 73

2. Article Number *(Transfer from service label)*
7019 2970 0002 2447 7689

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Gary Bromley ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
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er $500)

☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

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- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Catharine Wood
State Historic Preservation Office
800 Nazih Zuhdi Drive
Oklahoma City, OK 73105

9590 9402 5425 9189 3448 11

2. Article Number *(Transfer from service label)*
7019 2970 0002 2447 7665

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Daniels ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery 6-5-20

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
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er $500)

☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

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SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Ken Madison
Pogue Airport
3200 N. Airport Rd
Sand Springs, OK 74063

9590 9402 5425 9189 3448 59

2. Article Number *(Transfer from service label)*
7019 2970 0002 2447 7719

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X K Madison ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* SS CIA | C. [illegible] Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☒ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Mail
☐ Mail Restricted Delivery
500)

☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

A. Signature
X RECEIVED By OESC ☐ Agent ☐ Addressee

B. Received by (Printed Name) | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes ☐ No
If YES, enter delivery address below:

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Mail
500)

☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restric
Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation
☐ Signature Confirmation Restricted Delivery

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Brandy Wreath
Oklahoma Corporation Commission
PO Box 52000
Oklahoma [illegible]

9590 9402 5425 9189 3448 28

2. Article Number *(Transfer from service label)*
7019 2970 0002 2447 7726

A. Signature
X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery 6-5-20

D. Is delivery address different from item 1? ☐ Yes ☐ No
If YES, enter delivery address below:

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Mail
500)

☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Eve Atkinson
Oklahoma Tourism and Recreation Dept
900 North Stiles
Oklahoma City, OK 73104

9590 9402 5425 9189 3448 66

2. Article Number *(Transfer from service label)*
7015 0640 0005 1068 4032

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Mike Lewis
Oklahoma Department of Mines
2915 N. Classen Blvd., Suite 213
Oklahoma City, OK 73106

9590 9402 5425 9189 3448 42

2. Article Number (Transfer from service label)
7019 2970 0002 2447 7672

PS Form 3811, July 2015 PSN 7530-02-000-9053

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A. Signature
X

☐ Agent
☐ Addressee

B. Received by (Printed Name)

C. Date of Delivery
06-5-20

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Mail
☐ Mail Restricted Delivery
500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
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☐ Signature Confirmation Restricted Delivery

Domestic Return Receipt

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U.S. Postal Service™
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Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

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Extra Services & Fees *(check box, add fee as appropriate)*
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
$

Total Postage and Fees
$ 6.90

Sent To Bureau of Reclamation

Street and Apt. No., or PO Box No.

City, State, ZIP+4® 3448 73

Postmark Here

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7015 0640 0005 1068 6032

U.S. Postal Service™
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Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

OFFICIAL USE

Certified Mail Fee
$

Extra Services & Fees *(check box, add fee as appropriate)*
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
$

Total Postage and Fees
$ 6.90

Sent To OTRD

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City, State, ZIP+4® 3448 66

Postmark Here

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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Certified Mail Fee
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Extra Services & Fees *(check box, add fee as appropriate)*
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
$

Total Postage and Fees
$ 6.90

Sent To FAA

Street and Apt. No., or PO Box No.

City, State, ZIP+4® 3448 04

Postmark Here

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 2970 0002 2447 7726

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
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Certified Mail Fee
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Extra Services & Fees *(check box, add fee as appropriate)*
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
$

Total Postage and Fees
$ 6.90

Sent To Oklahoma Corp Commission

Street and Apt. No., or PO Box No. 9590 9402 5125

City, State, ZIP+4® 9189 3448 28

Postmark Here

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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OFFICIAL USE

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Extra Services & Fees *(check box, add fee as appropriate)*
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- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
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Subsurface Investigation

Appendix C

Liner and Final Cover System Stability Analysis

Appendix D

Groundwater Monitoring Plan

Groundwater Monitoring Plan
American Environmental Landfill

American Environmental Landfill, Inc.
207 North 177th West Avenue
Sand Springs, Oklahoma 74063

SCS ENGINEERS

27220345.00 | May 2024
Revised February 2025

8575 W. 110th Street, Suite 100
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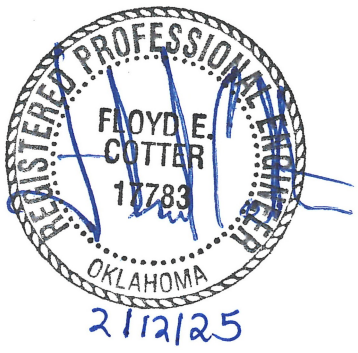
CERTIFICATION

This report has been prepared for exclusive use by American Environmental Landfill, Inc. for the American Environmental Landfill (AEL) for specific application to the project discussed, and it has been prepared in accordance with good engineering practices including consideration of industry standards and the requirements of the Oklahoma Department of Environmental Quality.

Prepared by:



Floyd Cotter, PE
SCS Engineers

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1.0 INTRODUCTION

This Groundwater Monitoring Plan is intended to assist the operators of American Environmental Landfill, Inc. in conducting the sampling and analysis of groundwater at the American Environmental Landfill (AEL). The AEL is located near Sand Springs, Oklahoma in Sections 35 and 36, Township 20 North, Range 10 East, in Osage County, Oklahoma. The project site is on the Wekiwa Oklahoma 7.5 Minute USGS Quadrangle map. AEL is bordered by the Arkansas River to the South (Figure 1). The AEL operates under the Oklahoma Department of Environmental Quality (ODEQ) Permit Number 3557021.

The objective of the groundwater monitoring system is to assess potential changes in groundwater quality and determine if these changes are the result of an impact from the landfill. Groundwater data is evaluated by establishing sample locations and developing an appropriate statistical background level for the comparison of compliance data. Background data is collected from locations where the groundwater has not been impacted by the landfill or during times when the groundwater has not been impacted by the landfill. Once appropriate background concentrations have been established, compliance data are statistically evaluated with respect to the background data.

This Groundwater Monitoring Plan describes the hydrogeological setting, the monitoring network, background and monitoring parameters, sampling frequency, sampling procedures, and statistical methods. The procedures in this Groundwater Monitoring Plan were developed following ODEQ regulations and the US EPA's guidance for statistical analysis of groundwater monitoring data.

2.0 GROUNDWATER MONITORING

This Section presents the existing and proposed monitoring well networks, sampling schedule, and monitoring parameters for AEL.

2.1 GROUNDWATER MONITORING NETWORK

The groundwater monitoring system shall be installed and yield groundwater samples from the uppermost aquifer that represent the quality of background groundwater that has not been affected by the AEL and that represents the quality of groundwater that has passed underneath the AEL. The current groundwater monitoring system for the American Environmental Landfill consists of twelve (12) monitoring wells. Seven of these monitoring wells in the groundwater monitoring network monitor the existing landfill area (Phases I, II, III, V, and VI) and are designated as MW-1, MW-3, MW-5, MW-6, MW-8R, MW-15A, and MW-21A. Five (5) monitoring wells in the groundwater monitoring network monitor the Phase IV Expansion area designated as MW-1_IV, MW-31B, MW-34, MW-36, and MW-38. The existing monitoring well coordinates and elevations are presented in Table 1, and the historical groundwater elevations are presented in Table 2.

Groundwater monitoring wells were installed on land owned by the AEL at a distance of no more than 150 meters from the permitted waste boundary of the disposal area. There are three upgradient monitoring wells (MW-1, MW-8R, and MW-21A) and four downgradient monitoring wells (MW-3, MW-5, MW-6, and MW-15A) located in the Existing Landfill Phases I, II, III, V, and VI. There is one upgradient monitoring well (MW-1_IV) and four downgradient monitoring wells (MW-31B, MW-34, MW-36, and MW-38) located in the Phase IV Landfill Expansion Area. Because the lateral expansion will be contiguous with the Phase IV Expansion Area, one upgradient monitoring well (MW-1_IV), and two downgradient monitoring wells (MW-36 and MW-38) are proposed to be removed from the groundwater monitoring network and will be plugged and abandoned in accordance with the OWRB requirements stated in OAC 785:35. There are two proposed downgradient groundwater monitoring wells (MW-39 and MW-40) to be added to the groundwater monitoring network. Piezometer 1 (P-1) is proposed to be converted to MW-40. There is one proposed upgradient groundwater monitoring well (MW-41) to be added to the groundwater monitoring network. Figure 2 shows the location of all abandoned, existing, and proposed borings, piezometers, and detection wells. The proposed monitoring well coordinates and elevations are presented in Table 3. Boring logs and a typical well construction diagram for existing and proposed monitoring wells are included in Appendix A.

2.1.1 Monitoring Well Installation

The AEL will provide the ODEQ two weeks' written notice prior to any drilling. The monitoring wells will be installed in accordance with OAC 785:35 and registered online or by mail with the OWRB within 60 days after installation by a licensed monitoring well installation contractor.

2.1.2 Monitoring Well Development

Monitoring wells will be developed through the use of a surge block and pump or bailer. The surge block will be moved vigorously through the screened interval or the saturated portion if the screen extends above the water table in order to suspend sediment in the well and remove fines from the filter pack. The pump or bailer will then be used to remove the water from the monitoring well. The use of the surge block may require several iterations until the water runs clear. Once one well volume has been removed from the monitoring well, the pH, specific conductance, and temperature of the water will be measured and recorded. The monitoring well will be purged until the groundwater quality measurements stabilize between purged well volumes or the purged water is clear.

2.1.3 Monitoring Well Redevelopment

Monitoring wells will be redeveloped when 15% or more of the well screen is occluded or the turbidity appears to be increasing. Monitoring well redevelopment will follow the procedures listed above.

2.1.4 Monitoring Well Sealing and Abandonment

If any monitoring well or piezometer requires abandonment, the sealing and abandonment will be conducted in accordance with the OWRB as stated in the OAC 785:35. The two monitoring wells (MW-36 and MW-38) and any observation well including piezometers will be abandoned by an Oklahoma certified well driller following these procedures.

2.2 GROUNDWATER MONITORING PARAMETERS AND SAMPLING SCHEDULE

2.2.1 Background Monitoring

Background groundwater quality is required to be established at each monitoring well in accordance with OAC 252:515-9-31. One full year of quarterly sampling consisting of statistically independent data is required to be collected for each parameter or constituents listed in 252:515-9-31(d)(1). Background groundwater data should contain the natural variations in groundwater chemistry. Ideally, the background data should contain enough data points to conduct the selected statistical analysis and exhibit any seasonal, temporal, or spatial variability. The background groundwater quality data should be representative of the groundwater quality near the landfill but not impacted by the landfill.

If new wells are installed near an existing well that monitors the same formation with a similar screen depth, it may be possible to use the existing well's background data for the newly installed monitoring well. A confirmation sample should be collected from the newly installed monitoring well and compared to the previous monitoring well's background data. If the confirmation sample results are statistically similar to the previous monitoring well's background data, the monitoring well may be placed into routine detection monitoring. The ODEQ's approval for waiving the background sampling requirements should be obtained before proceeding with any replacement monitoring well installations.

2.2.2 Detection Monitoring

Groundwater samples for detection monitoring should be collected following the same sampling procedures used to collect the background groundwater quality samples. Samples are to be collected from the monitoring wells semi-annually. A report of the sampling results and results of the statistical analysis will be submitted to the ODEQ within 60 days of the sampling date.

2.2.3 Monitoring Constituents

The constituents for background and detection monitoring are listed in OAC 252:515-9-31(d) and include pH and specific conductance at each groundwater monitoring point. The background and detection monitoring parameters are listed in Table 4. These constituents shall be used unless alternative constituents are approved in accordance with OAC 252:515-9-72.

3.0 SAMPLING PROCEDURES

The following subsections summarize specific tasks involved in sampling of the groundwater monitoring system. Samples will be obtained from the facility's groundwater monitoring system by a sampling technician fully trained in the required sampling procedures.

3.1 WELL INSPECTION

Prior to performing any purging or sampling, each monitoring well will be inspected to assess the integrity of the well components. The condition of each well will be evaluated for any physical damage that may have been caused by the operation of site equipment or other vehicular traffic. The security of each well will be assessed in order to confirm that no outside source contaminants have been introduced to the well. All inspection information, as well as the date and time, general weather conditions, and sampling personnel identification, will be documented on the Field Sampling Sheet presented in Appendix B. The actual form utilized may vary in format but the information indicated will be recorded.

3.2 SAMPLE COLLECTION PROCEDURES

For sample collection, each monitoring well in the groundwater monitoring system will be sampled utilizing equipment and methodologies that minimize the potential for alteration or contamination of the sample and that are capable of obtaining a sample representative of the formation groundwater. Care will be taken to avoid placing clean sampling equipment on the ground or on any contaminated surface. Additionally, personnel who contact sampling equipment that may contact the interior of the monitoring well or the groundwater shall wear powderless latex (or equivalent) gloves. If contamination is known to exist at certain locations, non-contaminated wells will be sampled prior to those wells that are known to be contaminated.

3.3 EQUIPMENT DECONTAMINATION

All equipment that may contact the interior of the well or groundwater will be decontaminated in the field immediately prior to use, or in the office/lab and protected using aluminum foil and/or plastic bags. Decontamination procedures will be documented for each sampling event. The decontamination procedure will consist of the following steps:

- Wash with laboratory-grade soap (such as Alconox or Liquinox);
- Triple rinse with distilled or deionized water; and
- Air dry prior to use.

Personnel who contact sampling equipment subsequent to decontamination shall wear powderless latex (or equivalent) gloves. Gloves will be replaced immediately if they become contaminated or torn.

3.4 WATER LEVEL MEASUREMENTS

Prior to groundwater purging and sampling, water level measurements will be taken at each well location utilizing a dedicated or portable water level indicator, tape, or other suitable measuring device capable of achieving an accuracy of 0.01 feet. The measuring device will be used in accordance with the manufacturer's recommendations and/or directions. Prior to measuring, all equipment that may contact the groundwater will be decontaminated with distilled water. All wells will be measured for depth to water immediately prior to purging. Measurements of the depth to

water from the top of the well casing will be to the nearest 0.01 foot, and the values will be recorded on the Field Sampling Sheets. Total well depths shall be obtained annually or if evidence of well tampering exists.

3.5 WELL PURGING

Immediately prior to sampling at each well location, the water within the well will be evacuated until measured water quality parameters indicate that formation water has entered the well or until a sufficient volume of water has been removed so that stagnant water has been purged from the well. The wells will be evacuated using the standard 3 to 5-well volume purging method or by low-flow (minimal drawdown) sampling methods. Low-flow sampling methods are preferred. If low-flow methods are used, all procedures will be in accordance with EPA/540/S-95/504, "Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures". This document has been included as Appendix C.

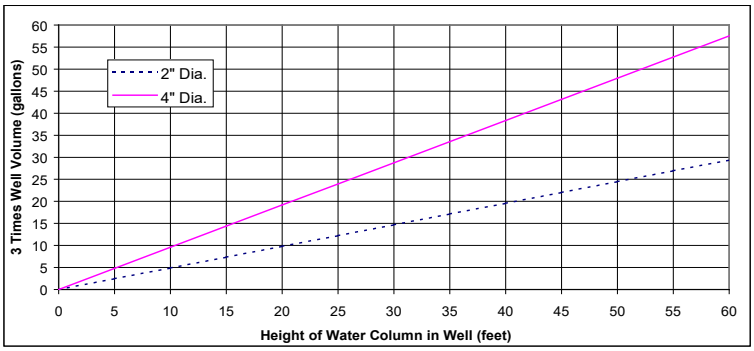
Procedures for low-flow sampling will include:

- Drawdown will be attempted to be kept to a minimum.
- Purging is complete when at least three parameters of the field-measured water quality parameters have stabilized for 3 successive readings.
- At least one volume of tubing & pump is purged before readings are counted. The volume of tubing & pump will be written on field datasheets along with cumulative volumes and times of parameter readings.
- At least 3 minutes minimum between parameter readings

During purging, representative samples of discharged water are to be periodically collected in clean containers or through a continuous flow cell and analyzed for field water quality parameters. Parameter results will be used to evaluate groundwater characteristics to aid in determining when the formation water is entering the well. At a minimum, the following parameters will be measured in the field: pH, specific conductance, turbidity, and temperature. Other field parameters such as dissolved oxygen (DO) and oxidation-reduction (redox) potential may be used to assist in evaluating purge effectiveness. Water quality parameters can be considered stable if three successive readings are within ±0.1 for pH, ±3% for conductivity, ±10 mv for redox potential, and ±10% for turbidity and DO. It should be noted that the turbidity reading is desired to stabilize at a value below 10 Nephelometric Turbidity Units (NTUs).

Purging may be considered complete when:

- Standard 3 to 5 well volume method - A minimum of three well volumes (based upon well construction records) have been evacuated from the well and two of the field measured parameters (pH, specific conductance and temperature) have stabilized, or to 5 well volumes, or until the well is pumped/bailed dry. If standard purge methods are used, then the well volume can be determined by using the inset chart. If three well volumes cannot be obtained due to the well being pumped or bailed dry, the well will be allowed to recover and then sampled. If sufficient water is not available for sampling within 24 hours of purging for slowly recovering wells, the well will be considered dry, and no sample will be collected.



- If low-flow (or minimal drawdown) techniques are used, purging activities will be accomplished using flow-control submersible bladder pumps. Purging rates will be monitored and depth-to-water measurements recorded so that evacuation rates do not induce a substantial lowering of the potentiometric head elevation within the well. Flow rates will vary for each well, but rates of approximately 0.1 to 0.5 L/min are typical. Purging of pump discharge lines is necessary prior to the collection of field parameter samples for field analysis using appropriate meters.

3.6 SAMPLE COLLECTION

Samples will be collected from each well using either a dedicated or disposable Teflon or polyethylene bailer or through the discharge of pumps used to evacuate the well. Samples will be collected at a rate that minimizes potential alteration of the sample due to agitation or oxidation. Pumping rates for the collection of samples for volatiles analysis (VOAs, etc.) will be approximately 0.1 L/min or less, to the extent practical based on the sampling equipment used. Pumping rates for the collection of other analyses may be increased but will be adjusted to a rate that also prevents chemical alteration.

If low-flow sampling methods are employed, the sampling rate is not to exceed the purging rate, with flow rates of approximately 0.1 to 0.5 L/min recommended (EPA/540/S-95/504). Sampling pumps are to be operated in a continuous manner so that they do not produce samples that are aerated in the return tube or upon discharge. Groundwater samples will be collected as soon as possible after well evacuation.

Samples will be collected and containerized in the order of the volatilization sensitivity of the parameter (i.e., volatile organics, organic compounds, inorganic species, and major cations and anions). The samples will be collected in appropriate containers with the appropriate sample preservative as described in subsequent sections.

3.7 SAMPLE PRESERVATION

Sample containers, preservation, handling, and analysis will meet the specifications described by "Test Methods for Evaluating Solid Waste Physical/Chemical Methods, third edition, Final Update IV, February 2007" or an equivalent substitute as approved by ODEQ. Sample containers will be supplied by the laboratory for each sampling event. The sample containers will be labeled to indicate the test parameters required. The appropriate preservatives will be added to each sample container based on the required analytical method.

3.8 CHAIN OF CUSTODY

Chain-of-custody procedures will allow for the possession and handling of samples to be traced from the time of collection through laboratory analysis. All sample containers will be labeled to avoid misidentification, have proper seals, and indicate the test parameters required. Chain-of-custody procedures will prevent potential tampering with samples collected. At the time each sample is collected, Chain-of-Custody will be completed and placed in the sample shipping container.

3.9 SAMPLE SHIPMENT

After collection and sample preservation, the labeled sample containers will be placed in an insulated shipping container using frozen ice packs or other suitable frozen material for temperature control. All samples included in the sample container will be packed in a manner that will minimize the potential for container breakage. An original Chain of Custody Form will be sealed in a water-resistant bag and placed with the appropriate sample bottle set. A copy will be maintained by the sampling personnel. Actual forms utilized may vary in format, but the information indicated is considered typical. The sample container will then be sealed with a custody seal for detection of unauthorized opening or potential tampering with sample containers and sent to the designated analytical laboratory. All shipments will be scheduled for next-day delivery. The temperature of the samples will be recorded when the sample container arrives at the analytical laboratory to assess that the appropriate sample temperature was maintained during shipment.

4.0 SAMPLE QUALITY CONTROL/QUALITY ASSURANCE

Quality control and quality assurance (QA/QC) samples will be collected to assist in maintaining the integrity of the data. The QA/QC samples are an integral part of maintaining the validity of the data and, therefore, are subject to the same handling and chain of custody protocols as the groundwater samples.

Groundwater samples will be collected in a manner so that chemical testing and evaluation of the samples will provide an accurate representation of the quality of the in-situ groundwater at the depth and location screened in the aquifer. This will require that all field equipment be calibrated prior to use and re-calibrated in the field before use, as necessary. Additionally, a number of factors must be considered that can affect the quality of the groundwater samples. These include the preparation of sample containers, sample collection, sample packaging and shipping, and laboratory analysis. As an aid in the detection and identification of errors, several types of field samples have been devised for quality assurance and quality control.

4.1 FIELD, TRIP, AND EQUIPMENT BLANKS

Trip and field blanks will be utilized during each round of sampling at the site. The trip blank will be provided by the analytical laboratory supplying the sample container. The trip blank, containing laboratory-grade deionized water will remain unopened and sent from and to the laboratory in the same manner as the site well samples. A field blank will be prepared in the field by pouring laboratory-grade deionized water into one of the clean sample containers opened in the field. The field blank will then be sealed and shipped in the same manner as the environmental samples. In the event that non-dedicated sampling equipment is utilized, a field equipment (rinsate) blank will be prepared by rinsing laboratory-grade deionized water over the sampling equipment immediately subsequent to decontamination and prior to sampling and capturing the rinse water in a sample container.

4.2 DUPLICATE SAMPLE

A duplicate sample will be collected from one well during each round of sampling at the site. The duplicate sample will be collected in the field using a matching set of sampling bottles and preservatives as the regular sample. Each duplicate sample will be collected by alternating filling between the regular sample bottles and the duplicate sample bottles, proceeding in the designated sampling order (i.e. VOAs first). Duplicate samples should not be physically different from regular samples in color, turbidity, or other physical characteristics.

5.0 LABORATORY QUALITY CONTROL

5.1 ANALYTICAL BLANKS AND SPIKES

The selected laboratory will use method quality control procedures that are equivalent to those described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Final Update IV, February 2007" or an equivalent substitute as approved by ODEQ. Duplicate samples, method blanks, instrument/reagent blanks, matrix spikes, blank/water reagent spikes and surrogate spikes are typical quality control checks performed throughout the analytical process. With the exception of instrument/reagent blanks and surrogate spikes, these checks are performed at a frequency of 5% or 10% (i.e., 1 in 20 samples, 1 in 10 samples). Instrument/reagent blanks and surrogate spikes are performed on a daily or per sample (where required by method) frequency. Each of the above applied Quality Control checks will be compared against the Acceptance Criterion for each QC check to maintain analytical quality.

The method blank is a blank solution that is treated as a sample for the parameter being measured, including all pretreatment/preparation procedures and is analyzed in the same manner as the well samples to assess analytical accuracy and the potential for sample contamination. Instrument/reagent blanks are prepared on a daily basis (where used) to detect contamination or interferences in the sample treatment solvents and chemicals to demonstrate that none of these applied chemicals systematically bias sample results.

Matrix spikes are well-samples fortified with known concentrations of analytes expected to be in the sample. The percent recovery of any spiked analyte is taken as a measure of the bias of the analytical method caused by the sample matrix. Blank/reagent water spikes are blank solutions fortified with known concentrations of analytes expected to be in samples. These spikes may (reagent water spikes) or may not (blank spike) be taken through the full analytical procedure prior to analysis. The percent recovery of any spiked analyte is taken as a measure of control on the analytical procedure. Surrogate spikes are utilized where a compound of a known amount that is not expected to be in the environmental sample is added to the sample. Volatile Organic Compound analysis uses this type of spike to measure method extraction efficiency. This spike is performed on every sample and QC sample where the analytical method requires it.

5.2 INSTRUMENT CALIBRATION

Applicable instruments are calibrated using calibration standards and method-specified calibration criteria. A solution containing various compounds of known concentrations is diluted and analyzed to establish calibration curves and is performed daily or per the method to monitor the accuracy and precision of the instrument. Instrument calibration is verified by analyzing a solution containing a known concentration of the pure compound(s) of interest and comparing it against the calibration curve. This standard compound is taken from the same stock as that used to develop the calibration curve. Calibration verification is done at a 5% frequency, or as the method requires, to check the stability of the calibration curve as well as the accuracy and precision of the system or analyst.

All standards and reagents used in laboratory procedures will be inventoried, labeled, logged and documented in accordance with Inorganics, Inorganics/Chemical Methods and Robotics, Semi-volatiles and Volatiles documentation procedures. All stock standards shall be purchased as certified primary solutions from reputable, commercial lab suppliers, and prepared from neat chemicals with certified purity. Stock standards shall be combined and/or diluted into secondary dilution standards, which are then diluted into working standards.

5.3 INSTRUMENT MAINTENANCE

Routine maintenance is performed and documented for all major instruments. In addition, any service agreements for laboratory equipment are renewed annually. The EPA's "Good Automated Laboratory Practices" (GALPs) shall be followed in the laboratory.

5.4 METHOD DETECTION LIMITS

Method Detection Limits (MDLs) will be updated annually per method and matrix. The MDL findings are produced annually.

6.0 DATA EVALUATION

This section outlines the proposed evaluation methodology that will be used for the detection of a release from the facility, utilizing PQLs (EQLS) as the reporting concentration limits for VOCs, and the Shewart-CUSUM control chart and/or Prediction Limits statistical comparisons. Data evaluation will be performed in accordance with the March 2009 Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance EPA 530/R-09-007 (Unified Guidance)

Background

During background sample collection it will be necessary to examine the data for outliers, anomalies, and trends that might be an indication of a release. Outliers and anomalies are inconsistently large or small values that can occur due to sampling, laboratory, transportation or transcription errors, or even by chance alone. Significant trends indicate a source of systematic error or an actual contamination occurrence that must be evaluated and corrected before the detection monitoring program can be implemented. The inclusion of such values in the historical database used for statistical evaluation could cause misinterpretation of the data set and result in an artificial increase in the magnitude of statistical limits, which could result in an increase in the false negative rate (i.e., a decrease in the sensitivity of the statistical procedure).

To remove the possibility of historical outliers and trends creating false statistical limits, the data for each well and each constituent will be tested for the existence of outliers in accordance with Chapter 12 of the Unified Guidance.

Outlier Analysis

A statistical outlier is a value that is discrepant from the other values in the data set. The outlier tests identify data points that do not appear to fit the distribution of the rest of the data set and determine if they differ significantly from the rest of the data. A value is considered to be suspect if it is an order of magnitude larger or smaller than the rest of the data. Sanitas employs the use of Dixon's, Rosner's and Tukey's Outlier Tests based on the number of values (n) in the dataset and number of non-detect values. The Outlier Test criteria is as follows:

- Parametric data with n > 20 analyzed using Dixon's Outlier Test.
- Parametric data with n < 20 analyzed using Rosner's Outlier Test.
- Non-parametric data analyzed using Tukey's Outlier Test.

Once a value is identified as a statistical outlier, it is checked for possible lab instrument failure, field collection problems, or data entry errors. However, outliers may exist naturally if there is an extremely wide inherent or temporal variability in the data. The Unified Guidance states that unless a likely error can be identified, the outlier should not be removed (Unified Guidance Section 5.2.3).

Sen's Slope/Mann-Kendall Statistical Analysis

A trend is a general increase or decrease in observed values of a variable over time. A trend analysis can be used to evaluate the significance of an apparent trend and to estimate the magnitude of that trend. Statistically significant trends may indicate a potential source of systemic error or contamination occurrence.

The statistical outlier and trend detection procedure will be performed for those wells that have had at least five (5) measurements for a given constituent. Once the background database is established, the outlier procedure described above may be applied and appropriate statistical limits set in accordance with the Unified Guidance.

6.1 STATISTICAL METHODOLOGY

For Detection Monitoring, this program will involve intra-well and inter-well analysis based on a comparison of well constituent concentrations to background data. Data evaluation will be performed in accordance with the Unified Guidance.

Interwell Statistical Analysis

The interwell comparison utilizes control charts or non-parametric prediction limits for statistical comparison of inorganic parameters. An interwell control chart analysis compares data collected from compliance (downgradient) monitoring wells with data collected from background (upgradient) monitoring wells. If a data point exceeds the calculated interwell prediction limit, then a statistically significant exceedance is noted. The distribution of the data was calculated by applying the Shapiro-Wilk test for normality, or the Ladder of Powers (Helsel & Hirsh, 1992) for transformed data. A parametric prediction limit was constructed for data determined to have a normal or transformed normal distribution. A non-parametric prediction limit was calculated for data not transformed normal or containing 51 percent to 90 percent non-detect results. A Poisson based prediction limit was calculated for data with greater than 90 percent non-detect results. This analysis is used for wells in detection monitoring to compare the current compliance data collected from the downgradient wells to the pooled historical background data from the upgradient wells.

Intrawell Analysis

The intrawell statistical method compares the most recent measurement at an individual monitoring well to its own historical background data set for a given parameter. The resulting statistical analysis produces a limit from the background data set to which the most recent measurements are compared.

The intrawell comparison utilizes control charts or non-parametric prediction intervals for statistical comparison of inorganic parameters. Intrawell control chart statistics compare each new measurement of an individual monitoring well to its own historical background data set for a given parameter. The resulting statistical analysis produces a control limit to which each new measurement is compared. Additionally, the cumulative sum (CUSUM) of each successive monitoring result is incorporated into the statistical analysis, which provides for detection of gradual and immediate trends. Trends are identified even if the actual results are below the control limit. For those parameters that are detected at least once, but less than 25 percent of the time, or are non-normal in distribution, a nonparametric prediction interval statistic is used. The Shewhart-CUSUM control chart statistical procedure requires a minimum of 8 background samples for computation of the statistical limit.

6.2 VOLATILE ORGANIC COMPOUNDS

PQLs asses if the quantitative value of the analyte is close to the measured value. Conversely, method detection limits (MDLs) indicate that the analyte is present in the sample with a specified degree of confidence. For analytes with estimated concentrations greater than the MDL but not the

PQL, it can only be concluded that the true concentration is greater than zero; the actual concentration cannot be determined.

The use of laboratory-specific PQLs (or EQLs) already incorporates a measure of the statistical uncertainty that is associated with the measurement process. Any VOC detected and verified at a concentration above the PQL (or EQL) would be statistically significant, and therefore trigger assessment monitoring. These decision rules apply only in cases where the constituent has rarely, or never, been detected in the background. VOCs detected at concentrations between the MDL and PQL will be reported but will not be considered statistically significant unless a verified concentration above the PQL is detected.

6.3 INORGANIC PARAMETERS

The statistical methodology for inorganic parameters in Detection Monitoring will include an intra-well and inter-well comparison of the detected constituent to the background data population for that constituent. The statistical limits for the background data set will be calculated using normal, lognormal, and nonparametric prediction limits depending on the distribution of the data set. A statistical program using combined Shewhart-CUSUM control charts and/or Prediction Interval Limits will be utilized in accordance with Unified Guidance Chapters 18-20.

For new monitoring wells, once four (4) rounds of background samples and one (1) detection event have been collected, an appropriate statistical method will be proposed to evaluate the data from these wells. Data evaluation will be performed in accordance with the Unified Guidance.

6.4 Detection Verification Procedure

Verification re-sampling is an integral part of the statistical methodology described by the Unified Guidance. Without verification re-sampling, much larger statistical limits would be required to achieve site-wide false positive rates of 5% or less. Furthermore, the resulting false negative rate would be greatly increased. The following procedure will be performed for each constituent determined to be initially above its statistical limit. Only constituents that initially exceed their statistical limit will be sampled for verification purposes. The use of a “pass 1 of 2” verification option will be implemented to manage the site-wide false positive and false negative rates in accordance with the Unified Guidance. The initial verification sampling event will be conducted no more than 30 days after the determination of the initial exceedance.

7.0 STATISTICALLY SIGNIFICANT INCREASE

If there is a verified statistically significant increase (SSI) over background levels for one or more constituents at any monitoring well, the AEL:

- Must notify the ODEQ in writing within 14 days of the determination and place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels; and

- Must establish an assessment monitoring program as discussed in Section 7.1 within 90 days of the determination and have the assessment monitoring program approved by the ODEQ; or

- May, during the 90-day development of an assessment monitoring program, demonstrate that a source other than the facility caused the contamination or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. A report documenting this demonstration shall be submitted to the ODEQ for approval.

If a successful demonstration is approved by the ODEQ, detection monitoring shall continue. If, at the end of the 90-day period, a successful demonstration is not made, the assessment monitoring program must be initiated.

7.1 ASSESSMENT MONITORING

Assessment monitoring shall be conducted at a frequency specified by the ODEQ. Groundwater shall be sampled and analyzed for the groundwater quality constituents in Table 4 as well as the constituents listed in Appendix C of OAC 252:515. The list of monitored constituents may be reduced with approval from the ODEQ. A minimum of one sample from each downgradient well and a minimum of four independent samples from each well shall be collected and analyzed to establish the background for any detected constituents that are listed in Appendix C of OAC 252:515. The ODEQ may specify a subset of wells to be sampled and analyzed during assessment monitoring.

After obtaining the results from the initial assessment monitoring sampling event, the AEL must notify the ODEQ in writing within 14 days and place a notice in the operating record identifying the constituents that have been detected. Within 90 days and on at least a semi-annual basis thereafter, the AEL shall:

- Resample all wells;

- Conduct analyses for all constituents in the detection monitoring program and any other constituents specified by the ODEQ;

- Notify the ODEQ in writing and record the concentrations in the operation record; and

- Establish background concentrations for any constituents detected that are listed in Appendix C of OAC 252:515.

If the concentration of all assessment monitoring constituents is at or below background values for two consecutive sampling events using the approved statistical procedure, the AEL shall notify the ODEQ in writing and may return to detection monitoring upon approval by the ODEQ. If one or more

assessment monitoring constituents are detected at statistically significant levels above the groundwater protection standard of OAC 252:515-9-96 in any sampling event, the AEL shall within 14 days of the finding:

- Notify the ODEQ in writing and place a notice in the operating record identifying the constituents that have exceeded the background levels;
- By certified mail with return receipt requested notify all persons who own the land or minerals or who reside on the land that directly overlies any part of the plume of contamination within one year time of travel if contaminants have migrated off-site;
- Submit for ODEQ a proposed plan and schedule for analyzing the environmental release from the facility and for developing appropriate corrective action;
- Submit to the ODEQ a copy of the notice sent to adjacent property owners along with a list of who was notified;
- Characterize the nature and extent of the release by installing additional monitoring wells as necessary; and
- Initiate an assessment of corrective action within 90 days.

7.2 CORRECTIVE MEASURES

If the assessment monitoring does not eliminate the landfill as the source of the SSI, then a corrective action program will be implemented following the described methods in OAC 252:515-9 Part 11 and Part 15.

8.0 MONITORING REPORTS

Groundwater monitoring reports will be submitted for newly installed monitoring wells, background sampling, and routine monitoring.

8.1 MONITORING WELL INSTALLATION

A report summarizing monitoring well installation activities with a location map, boring log, and monitoring well completion diagram will be submitted to the OWRB and ODEQ on forms prescribed by the OWRB. The report will include the well development details and survey coordinates and elevations. The monitoring well installation report will be submitted within 60 days of installation of the monitoring well or the last monitoring well of a group and may be submitted as part of the routine monitoring report.

8.2 BACKGROUND SAMPLING REPORT

A report summarizing the background sampling, statistical analysis, and results will be submitted to the ODEQ within 60 days of the last background sampling event. The report will include field data, monitoring well location maps, laboratory results, and statistical evaluations and summaries.

8.3 ROUTINE GROUNDWATER MONITORING REPORTS

A report summarizing the semi-annual sampling event will be submitted to the ODEQ within 60 days of the sampling date. The report will include field data, monitoring well location maps, groundwater flow summaries, laboratory results, and statistical evaluations and summaries.

9.0 REFERENCES

SCS Engineers, 2018, Hydrogeologic and Geotechnical Investigation.

U.S. EPA, 1989, Interim Final Guidance Document - Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities.

U.S. EPA, 1992, Addendum to Interim Final Guidance Document - Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities.

U.S. EPA, 1992, RCRA Ground-Water Monitoring, Draft Technical Guidance.

U.S. EPA, 2002, RCRA Waste Sampling, Draft Technical Guidance. Planning, Implementation, and Assessment. EPA530-D-02-002.

U.S. EPA, 2005, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846.

Tables and Figures

Table 1. Existing Groundwater Monitoring System Summary

Monitoring Point	Hydraulic Location	Monitoring Status	Northing	Easting	Surface Elevation (MSL)	Top of Casing Elevation (MSL)	Total Depth (ft)
Existing Landfill							
MW-1	Up Gradient	Active/Detection	428081.39	2504346.62	800.8	802.6	54.27
MW-3	Down Gradient	Active/Detection	429375.11	2503946.83	765.3	764.8	34.52
MW-5	Down Gradient	Active/Detection	429388.42	2505535.40	777.2	779.8	51.68
MW-6	Down Gradient	Active/Detection	429382.24	2504611.52	776.7	777.3	46.15
MW-8R	Up Gradient	Active/Detection	427977.14	2505669.03	805.8	N/A	53.73
MW-15A	Down Gradient	Active/Detection	429406.63	2505330.21	766.7	770.3	N/A
MW-21A	Up Gradient	Active/Detection	429087.75	2503006.88	788.4	791.5	43.01
Phase IV Expansion Area	**Hydraulic Location**	**Monitoring Status**	**Northing**	**Easting**	**Surface Elevation (MSL)**	**Top of Casing Elevation (MSL)**	**Total Depth (ft)**
MW-1_IV	Up Gradient	Active/Detection	430004.48	2502704.30	768.0	770.6	54.27
MW-31B	Down Gradient	Active/Detection	427682.56	2501501.90	737.0	739.9	66
MW-34	Down Gradient	Active/Detection	427724.68	2502710.33	777.0	779.9	95.55
MW-36	Down Gradient	Active/Detection	427948.70	2500404.97	729.4	731.1	59.23
MW-38	Down Gradient	Active/Detection	428689.42	2500077.29	727.7	729.5	47.35

Table 2. Historical Groundwater Elevations

Monitoring Well	TOC (MSL)	Date													Highest Elevation (MSL)
		07-21	08-21	09-21	10-21	11-21	12-21	1-22	03-05-22	03-31-22	04-22	05-22	06-21	08-22	
MW-36	731.10	34.54	35.13	34.61	33.32	33.07	33.24	31.96	31.95	32.00	32.04	32.05	31.94	31.97	699.16
MW-38	729.50	10.47	11.02	11.86	12.44	12.21	11.76	11.49	11.35	11.32	11.47	11.20	10.48	11.58	719.03
P-1	744.53	33.76	34.19	34.60	34.50	34.42	33.97	34.22	34.10	34.17	34.30	34.30	33.85	34.65	710.77
P-4	760.73	48.75	48.57	48.75	48.54	48.43	48.28	48.71	48.78	49.16	49.10	48.43	49.61	50.12	712.45
P-6	721.01	19.44	20.36	20.69	20.11	19.86	19.56	19.80	19.57	19.45	19.37	19.02	18.60	19.33	702.41
P-9	781.88	56.53	56.34	56.50	56.43	56.40	56.41	56.48	56.64	56.65	56.67	56.71	56.72	56.85	725.54
P-12	789.16	45.61	104.7	102.9	101.0	98.99	96.29	94.85	92.95	90.63	89.05	86.56	83.00	79.80	743.55
P-15	776.55	86.49	85.55	85.22	84.93	84.70	84.50	84.32	84.00	83.89	83.75	83.60	83.34	83.10	693.45
P-19	791.87	79.82	66.28	66.22	65.92	65.97	65.87	65.98	65.77	65.77	65.70	65.58	65.48	65.92	726.39
P-23	817.77	95.53	94.43	93.83	93.17	91.59	92.12	89.95	87.90	87.06	86.40	85.32	84.08	82.17	735.60
P-27	809.37	79.91	34.71	32.18	31.00	30.51	30.22	29.67	28.65	27.40	26.25	24.68	23.35	26.59	786.02
P-30	824.13	89.53	90.21	90.52	90.69	90.85	90.78	91.04	90.95	91.05	90.95	90.98	90.81	91.03	734.60
P-37	849.01	84.79	85.63	85.97	86.11	88.95	86.16	86.28	86.20	86.38	86.31	86.10	85.28	85.86	764.22
P-39	825.52	55.37	54.71	54.41	55.06	54.58	53.43	55.93	55.51	55.16	55.66	56.05	55.24	56.19	772.09
P-42	844.46	93.06	95.60	96.42	96.67	96.69	96.47	96.43	96.30	96.34	96.29	96.22	96.18	96.77	751.40

Table 3. Proposed Groundwater Monitoring Network

Monitoring Well		MW-39	MW-40	MW-41
Boring Number		-	P-1	-
Hydraulic Location		Downgradient	Downgradient	Upgradient
Northing		427657.60'	427676.72'	430988.35'
Easting		2500732.38'	2497783.12'	2500961.83'
Surface Elevation (MSL)		726.00 ft	741.91 ft	872.03 ft
Total Depth (FT BGS)		45	70	138
Screen Elevation (MSL)	Top	691.0	700.9	744.0
	Bottom	681.0	690.9	734.0

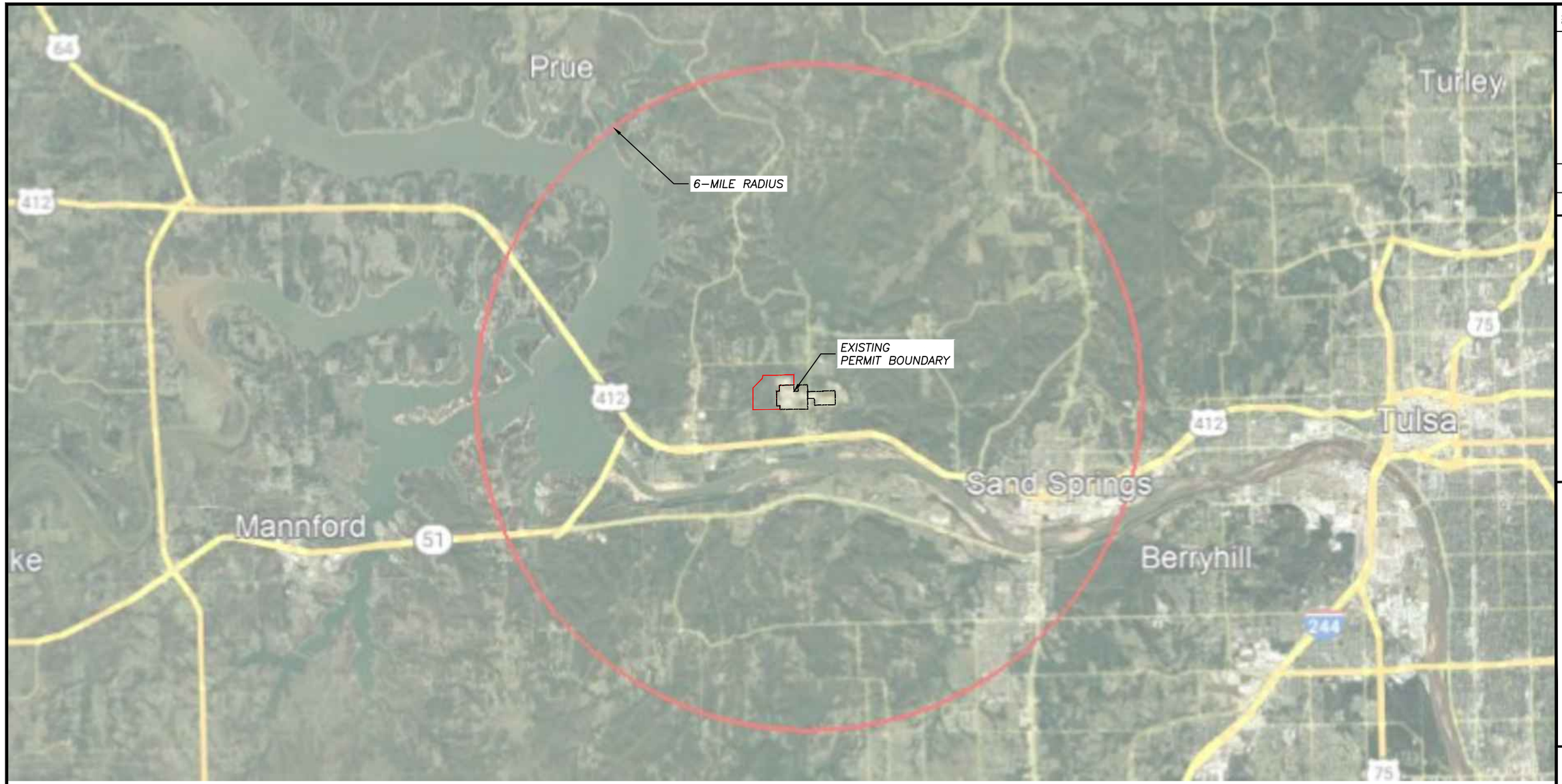
Notes:
1. Existing Piezometer 1 (P-1) is proposed to be converted to MW-40. Location and elevation was provided by Professional Surveyors, Inc.
2. MW-39 and MW-41 locations and elevations are proposed.

Table 4. Background and Routine Monitoring Parameters

Constituent	Units	Constituent	Units
Oklahoma Groundwater Quality Constituents		**Oklahoma Appendix A Constituents**	
Calcium	mg/L	cis-1,2-Dichloroethene	ug/L
Carbonates	mg/L	trans-1,2-Dichloroethene	ug/L
Chemical Oxygen Demand	mg/L	1,2-Dichloropropane	ug/L
Chloride	mg/L	cis 1,3-Dichloropropene	ug/L
Magnesium	mg/L	trans 1,3-Dichloropropene	ug/L
Nitrate/Nitrite	mg/L	Ethylbenzene	ug/L
pH	S.U.	2-Hexanone	ug/L
Potassium	mg/L	Lead	ug/L
Sodium	mg/L	Bromomethane	mg/L
Specific Conductivity	umhos/cm	Chloromethane	ug/L
Sulfate	mg/L	Dibromomethane	ug/L
Oklahoma Appendix A Constituents	**Units**	Methylene chloride	ug/L
Acetone	ug/L	Methyl ethyl ketone	ug/L
Acrylonitrile	ug/L	Methyl iodide	ug/L
Antimony	mg/L	4-Methyl-2-pentanone	ug/L
Arsenic	mg/L	Nickel	mg/L
Barium	mg/L	Selenium	mg/L
Benzene	ug/L	Silver	mg/L
Beryllium	mg/L	Styrene	ug/L
Bromochloromethane	ug/L	1,1,1,2-Tetrachloroethane	ug/L

Bromodichloromethane	ug/L	1,1,2,2-Tetrachloroethane	ug/L
Bromoform; Tribromomethane	ug/L	Tetrachloroethene	ug/L
Cadmium	mg/L	Perchloroethylene	ug/L
Carbon disulfide	ug/L	Thallium	mg/L
Carbon tetrachloride	ug/L	Toluene	ug/L
Chlorobenzene	ug/L	1,1,1-Trichloroethane	ug/L
Chloroethane	ug/L	1,1,2-Trichloroethane	ug/L
Chloroform	ug/L	Trichloroethene	ug/L
Chromium	mg/L	Trichlorofluoromethane	ug/L
Cobalt	mg/L	1,2,3-Trichloropropane	ug/L
Copper	mg/L	Vanadium	mg/L
Dibromochloromethane	ug/L	Vinyl acetate	ug/L
1,2-Dibromo-3-chloropropane	ug/L	Vinyl chloride	ug/L
1,2-Dibromoethane	ug/L	Xylenes	ug/L
1,2-Dichlorobenzene	ug/L	Zinc	mg/L
1,4-Dichlorobenzene	ug/L	**Field Parameters**	**Units**
trans-1,4-Dichloro-2-butene	ug/L	Depth to water	ug/L
1,1-Dichloroethane	ug/L	Total well depth	feet
1,2-Dichloroethane	ug/L	Temperature	feet
1,1-Dichloroethene	ug/L	Specific conductivity	umhos/cm
		pH	S.U.

Figure 1. Site Location



LEGEND:

SOLID WASTE PERMIT BOUNDARY

PROPOSED EXPANSION AREA PERMIT BOUNDARY

6-MILE RADIUS

NOTE:

1. APPROXIMATE 6-MILE RADIUS TAKEN FROM GOOGLE EARTH

N

10000 0 10000 20000

SCALE FEET

REV.	DATE	DESCRIPTION	CK. BY
1			
2			
3			
4			
5			
6			

SHEET TITLE: SITE LOCATION

PROJECT TITLE: GROUNDWATER MONITORING PLAN

CLIENT: AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OK

SCS ENGINEERS
8575 West 110th Street, Suite 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DSN. BY:	DWN. BY:	CHK. BY:	QA RVW BY:	PROJ. MGR
27220345.00	TWL	TWL	CF	WJM	WJM

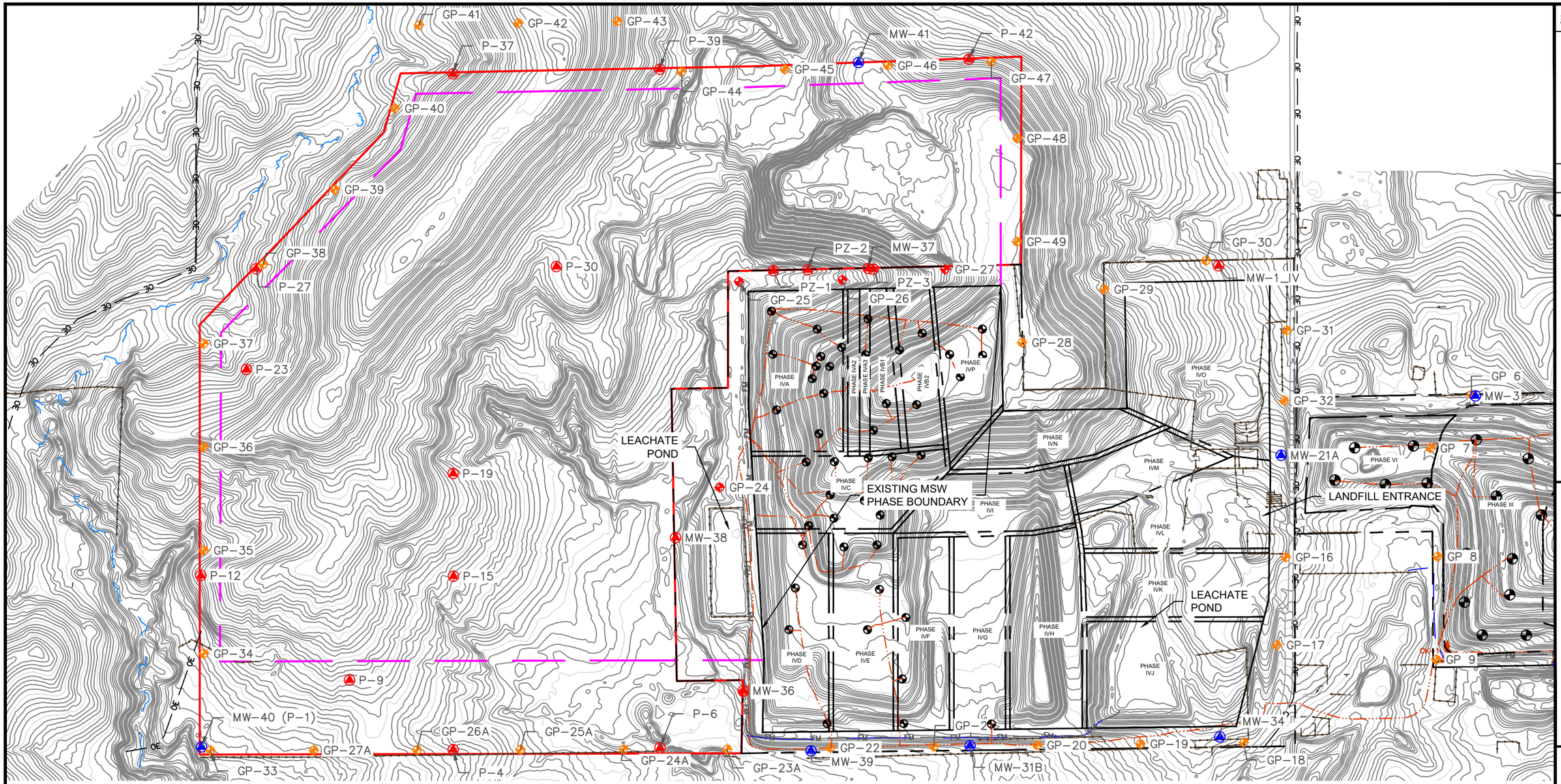
CADD FILE: GROUNDWATER MONITORING NETWORK.DWG

DATE: 12/8/23

SCALE: 1"=10,000'

DRAWING NO. 1 of 2

Figure 2. Proposed Groundwater Monitoring System



LEGEND:

- EXISTING 2' MINOR CONTOUR
- 1570 EXISTING 10' MAJOR CONTOUR
- EXISTING FENCE
- OE OE EXISTING OVERHEAD ELECTRIC
- EXISTING UNPAVED ROAD
- EXISTING PAVED ROAD
- EXISTING BODY OF WATER
- SOLID WASTE PHASE BOUNDARY
- SOLID WASTE PERMIT BOUNDARY
- ELECTRICAL CONDUIT
- FM FM LEACHATE FORCEMAIN
- LANDFILL GAS COLLECTION SYSTEM PIPING
- EXTRACTION WELL
- GAS PROBE
- MONITORING WELL
- MONITORING WELL ABANDONMENT
- GAS PROBE ABANDONMENT
- PROPOSED EXPANSION AREA PERMIT BOUNDARY
- PROPOSED LIMITS OF WASTE
- EXISTING STREAM

N

500 0 500 1000

SCALE FEET

REV:	DATE	DESCRIPTION	OK. BY
1			
2			
3			
4			
5			
6			

SHEET TITLE: PROPOSED EXPLOSIVE GAS MONITORING SYSTEM

PROJECT TITLE: GROUNDWATER MONITORING PLAN

CLIENT: AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OK

SCS ENGINEERS
8575 West 110th Street, Suite 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	27220345.00
DSN. BY:	TWL
DWN. BY:	TWL
CHK. BY:	CF
QA/QC BY:	WJM
PROJ. MGR	WJM

CADD FILE: GROUNDWATER MONITORING NETWORK.DWG

DATE: 12/8/23

SCALE: 1"=500'

DRAWING NO. 2 of 2

Appendix A

Boring Logs and Well Construction Diagram

(NOT TO SCALE)

SURFACE SEAL: CONCRETE OR CEMENT GROUT PLACED ABOVE THE ANNULAR SEAL FROM A DEPTH OF 2–FT TO GROUND SURFACE.

ANNULAR SEAL: BENTONITE CHIPS, CEMENT/BENTONITE GROUT, OR BENTONITE GROUT (SEE NOTE 1) PLACED FROM FILTER PACK SEAL TO WITHIN 2–FT OF GROUND SURFACE

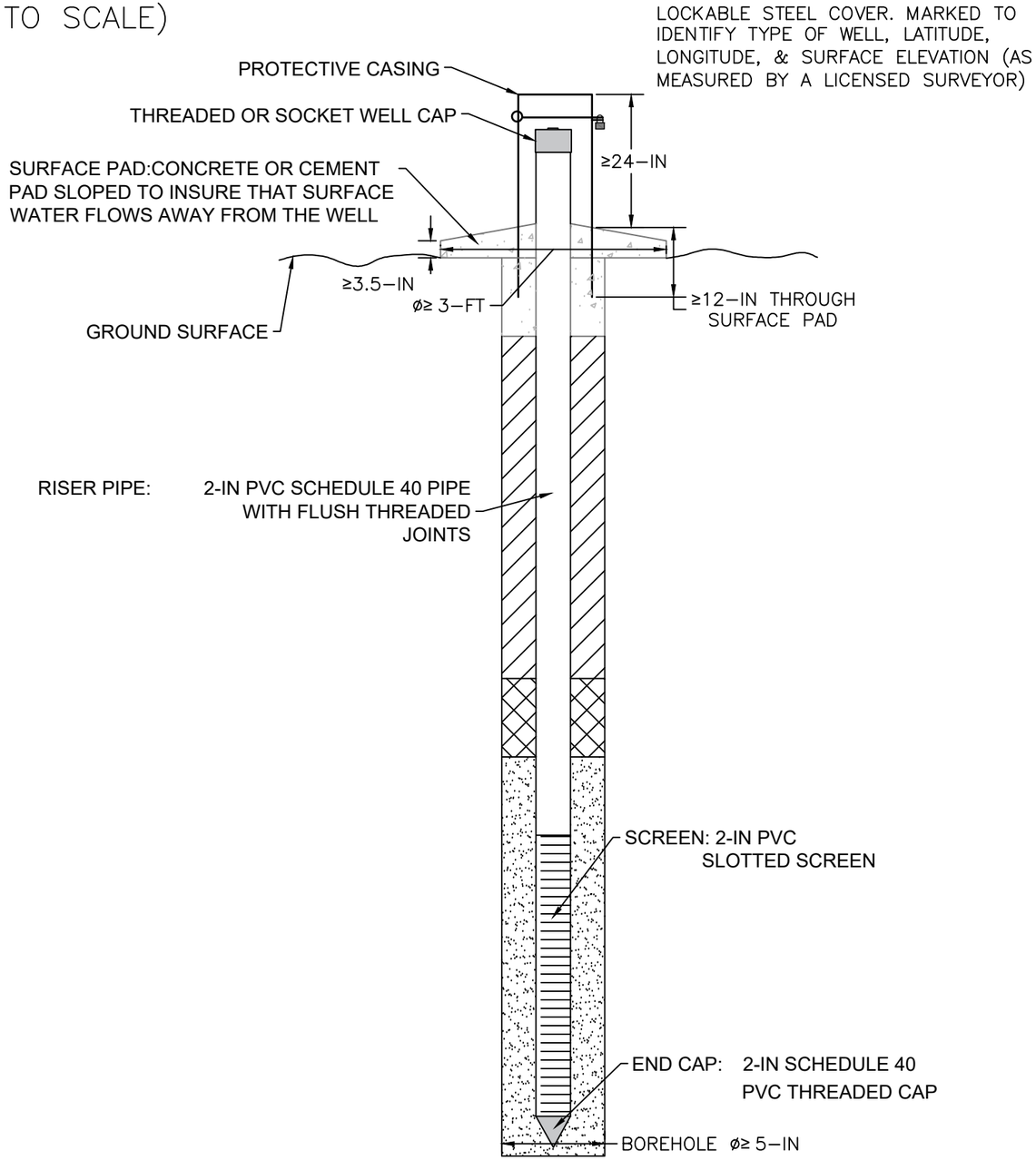
FILTER PACK SEAL: AT LEAST 2–FT OF HYDRATED BENTONITE (0.25"–0.75" IN SIZE) PLACED ABOVE FILTER PACK.

FILTER PACK: SILICA SAND; PLACED FROM BOTTOM OF BOREHOLE TO 2–FT ABOVE THE TOP OF SCREEN.

NOTES:

1. ANNULAR SEAL: CEMENT GROUT MIX RATIO OF 94–LBS CEMENT TO A MAXIMUM OF 6–GAL WATER IS USED, AND MIXED TO THE CONSISTENCY RECOMMENDED BY THE CEMENT MANUFACTURER. MAXIMUM OF TWENTY PERCENT (20%) BENTONITE BY DRY WEIGHT MAY BE ADDED TO THE CEMENT GROUT TO FORM THE CEMENT/BENTONITE GROUT MIXTURE. THE BENTONITE IS PREHYDRATED TO THE MANUFACTURER'S RECOMMENDED CONSISTENCY. THE BENTONITE GROUT HAS AT LEAST TWENTY PERCENT (20%) BENTONITE BY DRY WEIGHT, AND IS MIXED ACCORDING TO THE MANUFACTURER'S RECOMMENDED CONSISTENCY.

2. WHEN THE PLACEMENT OF GROUT WILL EXCEED 20–FT, THE GROUT IS PLACED THROUGH A TREMIE PIPE AND FILLED OR PUMPED FROM THE BOTTOM UPWARD.



REV.	DATE	CK. BY
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1	-	-
2	-	-
3	-	-
4	-	-
5	-	-

SHEET TITLE
TYPICAL MONITORING WELL CONSTRUCTION

PROJECT TITLE
GROUNDWATER MONITORING PLAN

CLIENT
AMERICAN ENVIRONMENTAL LANDFILL, INC
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OKLAHOMA

SCS ENGINEERS
8575 West 110th Street, Suite 100
Overland Park, Kansas 66210
PH: (913) 681-0030 FAX: (913) 681-0012

PROJ. NO.	DSN. BY:	Q/A REW BY:
27219016.00	TWL	W.J.M
DSN. BY:	CHK. BY:	PROJ. MGR
TWL	W.J.M	W.J.M

CADD FILE:
TYPICAL MONITORING WELL CONSTRUCTION.DWG

DATE:
3/14/23

DRAWING NO.
A-1

K:\AEL\Projects\2020\27220345.00 - Lateral Expansion Permitting\Task 8 - Application Submittal to ODEQ\App D GW Monitoring Plan\Typical Monitoring Well Construction.dwg Mar 14, 2023 - 4:02pm Layout Name: Typical Monitoring Well Construction By: 4810twl

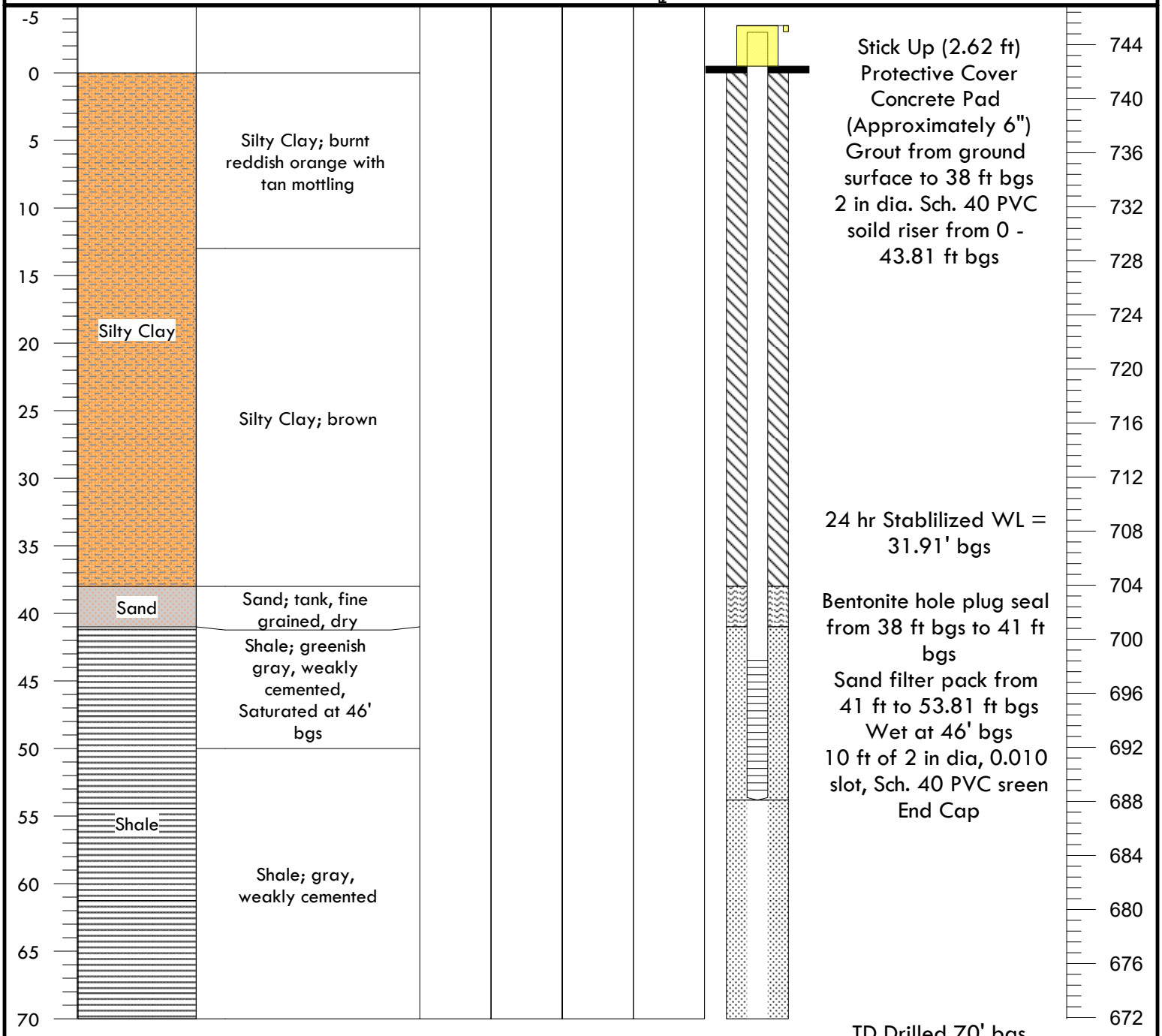
SCS ENGINEERS

LOG OF BORING NO.: **P-1**

SHEET NUMBER: 1 of 1

11219 Richardson Drive
North Little Rock, AR

CLIENT: AEL Landfill	DRILLER: Timothy Swyden	SURFACE ELEVATION: 741.91 ft
PROJECT NAME: 203-Acre Expansion	DRILLING RIG: Dedrick 50 Turbo	TOC ELEVATION: 744.53 ft
PROJECT NUMBER: 27220345.00	DRILLING METHOD: Split Spoon/Core	WELL DEPTH COMPLETION: 70 fbgs
PROJECT LOCATION: Sand Springs, Oklahoma	DRILLING CONTRACTOR: Mohawk Drilling, Inc.	LOCATION: EASTING: 2497783.12 NORTHING: 427676.72
GEOLOGIST: Joe Wrath	SAMPLING METHOD: Split Spoon/Core	WATER LEVEL: 31.91 fbgs
START DATE: 12/16/2020	BORING DIAMETER: 8.25"	STBLZD WATER ELEVATION: 710 ft
FINISH DATE:	WELL DIAMETER: 2"	WATER LEVEL DATE: 7/19/2021



THE STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: ACTUAL TRANSITIONS MAY BE GRADUAL

Appendix B

Example Form

Field Sampling Sheet

Project Name: _____ **Monitoring Point:** _____
Project Location: _____
Project Number: _____ **Date (s):** _____

Field Team Members
Name: _____ Affiliation: _____
Name: _____ Affiliation: _____

Weather Conditions
Temp: _____ °F Wind Direction: N S E W (circle two if needed)
Precipitation: None Light Heavy Sky: Cloudy Sunny Partly

Well Observations
Well Pad _____
Casing _____
Protective Casing _____
Reference Mark/Identification _____

Locks	Yes	No
Protective Casing		
Well		

Groundwater Level Measurements
Static Water Level: _____ feet below TOC
Date/Time Measured: _____ Total Depth: _____ feet below TOC

Purging Activities
Purged By: _____ Purge Date: _____
Purge Method: Bailer Dedicated Pump Non-Dedicated Pump (circle one)
Well Diameter: 1-inch 2-inch 3-inch 4-inch Other _____ (circle one)
Purge Volume Calculation: _____ Total Purge Volume: _____ gallons
Initial Parameter Readings: _____ pH _____ Spec. Cond. _____ Temp
Physical appearance of purge water: _____

Purge Time	Cumulative Purge Vol. (gallons)	Purge Rate (ml/m)	pH	Specific Conductivity (µS)	Temp (°C)	Other	Other

Sampling Activities
Sampled By: _____ Sample Date/Time: _____
Sample Method: Bailer Dedicated Pump Non-Dedicated Pump (circle one)
Sample Parameters: _____ pH _____ Spec. Cond. _____ Temp
Water Level: _____ feet below TOC

Observations/Comments: (i.e., equipment malfunctions, contamination sources, sampling difficulties; duplicate sample)

Form Completed By: _____ **Date:** _____

Appendix C

Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures

United States Environmental Protection Agency | Office of Research and Development | Office of Solid Waste and Emergency Response | EPA/540/S-95/504 April 1996

Ground Water Issue

LOW-FLOW (MINIMAL DRAWDOWN) GROUND-WATER SAMPLING PROCEDURES

by Robert W. Puls[1] and Michael J. Barcelona[2]

Background

The Regional Superfund Ground Water Forum is a group of ground-water scientists, representing EPA's Regional Superfund Offices, organized to exchange information related to ground-water remediation at Superfund sites. One of the major concerns of the Forum is the sampling of ground water to support site assessment and remedial performance monitoring objectives. This paper is intended to provide background information on the development of low-flow sampling procedures and its application under a variety of hydrogeologic settings. It is hoped that the paper will support the production of standard operating procedures for use by EPA Regional personnel and other environmental professionals engaged in ground-water sampling.

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I. Introduction

The methods and objectives of ground-water sampling to assess water quality have evolved over time. Initially the emphasis was on the assessment of water quality of aquifers as sources of drinking water. Large water-bearing units were identified and sampled in keeping with that objective. These were highly productive aquifers that supplied drinking water via private wells or through public water supply systems. Gradually, with the increasing awareness of subsurface pollution of these water resources, the understanding of complex hydrogeochemical processes which govern the fate and transport of contaminants in the subsurface increased. This increase in understanding was also due to advances in a number of scientific disciplines and improvements in tools used for site characterization and ground-water sampling. Ground-water quality investigations where pollution was detected initially borrowed ideas, methods, and materials for site characterization from the water supply field and water analysis from public health practices. This included the materials and manner in which monitoring wells were installed and the way in which water was brought to the surface, treated, preserved and analyzed. The prevailing conceptual ideas included convenient generalizations of ground-water resources in terms of large and relatively homogeneous hydrologic *units*. With time it became apparent that conventional water supply generalizations of *homogeneity* did not adequately represent field data regarding pollution of these subsurface resources. The important role of *heterogeneity* became increasingly clear not only in geologic terms, but also in terms of complex physical,

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chemical and biological subsurface processes. With greater appreciation of the role of heterogeneity, it became evident that subsurface pollution was ubiquitous and encompassed the unsaturated zone to the deep subsurface and included unconsolidated sediments, fractured rock, and *aquitards* or low-yielding or impermeable formations. Small-scale processes and heterogeneities were shown to be important in identifying contaminant distributions and in controlling water and contaminant flow paths.

It is beyond the scope of this paper to summarize all the advances in the field of ground-water quality investigations and remediation, but two particular issues have bearing on ground-water sampling today: aquifer heterogeneity and colloidal transport. Aquifer heterogeneities affect contaminant flow paths and include variations in geology, geochemistry, hydrology and microbiology. As methods and the tools available for subsurface investigations have become increasingly sophisticated and understanding of the subsurface environment has advanced, there is an awareness that in most cases a primary concern for site investigations is characterization of contaminant flow paths rather than entire aquifers. In fact, in many cases, plume thickness can be less than well screen lengths (e.g., 3-6 m) typically installed at hazardous waste sites to detect and monitor plume movement over time. Small-scale differences have increasingly been shown to be important and there is a general trend toward smaller diameter wells and shorter screens.

The hydrogeochemical significance of colloidal-size particles in subsurface systems has been realized during the past several years (Gschwend and Reynolds, 1987; McCarthy and Zachara, 1989; Puls, 1990; Ryan and Gschwend, 1990). This realization resulted from both field and laboratory studies that showed faster contaminant migration over greater distances and at higher concentrations than flow and transport model predictions would suggest (Buddemeier and Hunt, 1988; Enfield and Bengtsson, 1988; Penrose et al., 1990). Such models typically account for interaction between the mobile aqueous and immobile solid phases, but do not allow for a mobile, reactive solid phase. It is recognition of this third *phase* as a possible means of contaminant transport that has brought increasing attention to the manner in which samples are collected and processed for analysis (Puls et al., 1990; McCarthy and Degueldre, 1993; Backhus et al., 1993; U. S. EPA, 1995). If such a phase is present in sufficient mass, possesses high sorption reactivity, large surface area, and remains stable in suspension, it can serve as an important mechanism to facilitate contaminant transport in many types of subsurface systems.

Colloids are particles that are sufficiently small so that the surface free energy of the particle dominates the bulk free energy. Typically, in ground water, this includes particles with diameters between 1 and 1000 nm. The most commonly observed mobile particles include: secondary clay minerals; hydrous iron, aluminum, and manganese oxides; dissolved and particulate organic materials, and viruses and bacteria. These reactive particles have been shown to be mobile under a variety of conditions in both field studies and laboratory column experiments, and as such need to be included in monitoring programs where identification of the *total* mobile contaminant loading (dissolved + naturally suspended particles) at a site is an objective. To that end, sampling methodologies must be used which do not artificially bias *naturally* suspended particle concentrations.

Currently the most common ground-water purging and sampling methodology is to purge a well using bailers or high speed pumps to remove 3 to 5 casing volumes followed by sample collection. This method can cause adverse impacts on sample quality through collection of samples with high levels of turbidity. This results in the inclusion of otherwise immobile artifactual particles which produce an overestimation of certain analytes of interest (e.g., metals or hydrophobic organic compounds). Numerous documented problems associated with filtration (Danielsson, 1982; Laxen and Chandler, 1982; Horowitz et al., 1992) make this an undesirable method of rectifying the turbidity problem, and include the removal of potentially mobile (contaminant-associated) particles during filtration, thus artificially biasing contaminant concentrations low. Sampling-induced turbidity problems can often be mitigated by using low-flow purging and sampling techniques.

Current subsurface conceptual models have undergone considerable refinement due to the recent development and increased use of field screening tools. So-called hydraulic *push* technologies (e.g., cone penetrometer, Geoprobe®, QED HydroPunch®) enable relatively fast screening site characterization which can then be used to design and install a monitoring well network. Indeed, alternatives to conventional monitoring wells are now being considered for some hydrogeologic settings. The ultimate design of any monitoring system should however be based upon adequate site characterization and be consistent with established monitoring objectives.

If the sampling program objectives include accurate assessment of the magnitude and extent of subsurface contamination over time and/or accurate assessment of subsequent remedial performance, then some information regarding plume delineation in three-dimensional space is necessary prior to monitoring well network design and installation. This can be accomplished with a variety of different tools and equipment ranging from hand-operated augers to screening tools mentioned above and large drilling rigs. Detailed information on ground-water flow velocity, direction, and horizontal and vertical variability are essential baseline data requirements. Detailed soil and geologic data are required prior to and during the installation of sampling points. This includes historical as well as detailed soil and geologic logs which accumulate during the site investigation. The use of borehole geophysical techniques is also recommended. With this information (together with other site characterization data) and a clear understanding of sampling

objectives, then appropriate location, screen length, well diameter, slot size, etc. for the monitoring well network can be decided. This is especially critical for new in situ remedial approaches or natural attenuation assessments at hazardous waste sites.

In general, the overall goal of any ground-water sampling program is to collect water samples with no alteration in water chemistry; analytical data thus obtained may be used for a variety of specific monitoring programs depending on the regulatory requirements. The sampling methodology described in this paper assumes that the monitoring goal is to sample monitoring wells for the presence of contaminants and it is applicable whether mobile colloids are a concern or not and whether the analytes of concern are metals (and metalloids) or organic compounds.

II. Monitoring Objectives and Design Considerations

The following issues are important to consider prior to the design and implementation of any ground-water monitoring program, including those which anticipate using low-flow purging and sampling procedures.

A. Data Quality Objectives (DQOs)

Monitoring objectives include four main types: detection, assessment, corrective-action evaluation and resource evaluation, along with *hybrid* variations such as site-assessments for property transfers and water availability investigations. Monitoring objectives may change as contamination or water quality problems are discovered. However, there are a number of common components of monitoring programs which should be recognized as important regardless of initial objectives. These components include:

1) Development of a conceptual model that incorporates elements of the regional geology to the local geologic framework. The conceptual model development also includes initial site characterization efforts to identify hydrostratigraphic units and likely flow-paths using a minimum number of borings and well completions;

2) Cost-effective and well documented collection of high quality data utilizing simple, accurate, and reproducible techniques; and

3) Refinement of the conceptual model based on supplementary data collection and analysis.

These fundamental components serve many types of monitoring programs and provide a basis for future efforts that evolve in complexity and level of spatial detail as purposes and objectives expand. High quality, reproducible data collection is a common goal regardless of program objectives.

High quality data collection implies data of sufficient accuracy, precision, and completeness (i.e., ratio of valid analytical results to the minimum sample number called for by the program design) to meet the program objectives. Accuracy depends on the correct choice of monitoring tools and procedures to minimize sample and subsurface disturbance from collection to analysis. Precision depends on the repeatability of sampling and analytical protocols. It can be assured or improved by replication of sample analyses including blanks, field/lab standards and reference standards.

B. Sample Representativeness

An important goal of any monitoring program is collection of data that is truly representative of conditions at the site. The term *representativeness* applies to chemical and hydrogeologic data collected via wells, borings, piezometers, geophysical and soil gas measurements, lysimeters, and temporary sampling points. It involves a recognition of the statistical variability of individual subsurface physical properties, and contaminant or major ion concentration levels, while explaining extreme values. Subsurface temporal and spatial variability are facts. Good professional practice seeks to maximize representativeness by using proven accurate and reproducible techniques to define limits on the distribution of measurements collected at a site. However, measures of representativeness are dynamic and are controlled by evolving site characterization and monitoring objectives. An evolutionary site characterization model, as shown in Figure 1, provides a systematic approach to the goal of consistent data collection.

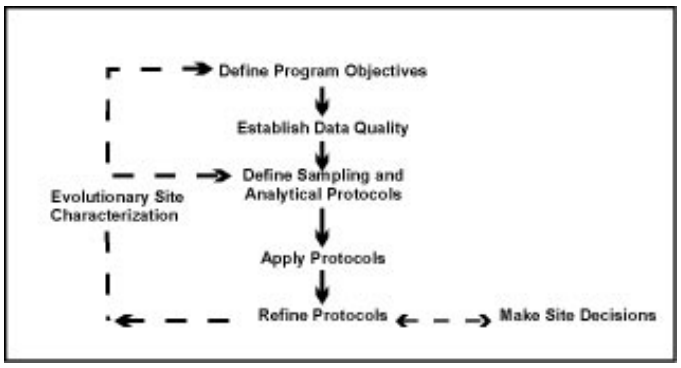

Figure 1. Evolutionary Site Characterization Model

The model emphasizes a recognition of the causes of the variability (e.g., use of inappropriate technology such as using bailers to purge wells; imprecise or operator-dependent methods) and the need to control avoidable errors.

1) Questions of Scale

A sampling plan designed to collect representative samples must take into account the potential scale of changes in site conditions through space and time as well as the chemical associations and behavior of the parameters that are targeted for investigation. In subsurface systems, physical (i.e., aquifer) and chemical properties over time or space are not statistically independent. In fact, samples taken in close proximity (i.e., within distances of a few meters) or within short time periods (i.e., more frequently than monthly) are highly auto-correlated. This means that designs employing high-sampling frequency (e.g., monthly) or dense spatial monitoring designs run the risk of redundant data collection and misleading inferences regarding trends in values that aren't statistically valid. In practice, contaminant detection and assessment monitoring programs rarely suffer these *over-sampling* concerns. In corrective-action evaluation programs, it is also possible that too little data may be collected over space or time. In these cases, false interpretation of the spatial extent of contamination or underestimation of temporal concentration variability may result.

2) Target Parameters

Parameter selection in monitoring program design is most often dictated by the regulatory status of the site. However, background water quality constituents, purging indicator parameters, and contaminants, all represent targets for data collection programs. The tools and procedures used in these programs should be equally rigorous and applicable to all categories of data, since all may be needed to determine or support regulatory action.

C. Sampling Point Design and Construction

Detailed site characterization is central to all decision-making purposes and the basis for this characterization resides in identification of the geologic framework and major hydro-stratigraphic units. Fundamental data for sample point location include: subsurface lithology, head-differences and background geochemical conditions. Each sampling point has a proper use or uses which should be documented at a level which is appropriate for the program's data quality objectives. Individual sampling points may not always be able to fulfill multiple monitoring objectives (e.g., detection, assessment, corrective action).

1) Compatibility with Monitoring Program and Data Quality Objectives

Specifics of sampling point location and design will be dictated by the complexity of subsurface lithology and variability in contaminant and/or geochemical conditions. It should be noted that, regardless of the ground-water sampling approach, few sampling points (e.g., wells, drive-points, screened augers) have zones of influence in excess of a few feet. Therefore, the spatial frequency of sampling points should be carefully selected and designed.

2) Flexibility of Sampling Point Design

In most cases *well-point* diameters in excess of 1 7/8 inches will permit the use of most types of submersible pumping devices for low-flow (minimal drawdown) sampling. It is suggested that *short* (e.g., less than 1.6 m) screens be incorporated into the monitoring design where possible so that comparable results from one device to another might be expected. *Short*, of course, is relative to the degree of vertical water quality variability expected at a site.

3) Equilibration of Sampling Point

Time should be allowed for equilibration of the well or sampling point with the formation after installation. Placement of well or sampling points in the subsurface produces some disturbance of ambient conditions. Drilling techniques (e.g., auger, rotary, etc.) are generally considered to cause more disturbance than *direct-push* technologies. In either case, there may be a period (i.e., days to months) during which water quality near the point may be distinctly different from that in the formation. Proper development of the sampling point and adjacent formation to remove fines created during emplacement will shorten this water quality *recovery* period.

III. Definition of Low-Flow Purging and Sampling

It is generally accepted that water in the well casing is non-representative of the formation water and needs to be purged prior to collection of ground-water samples. However, the water in the screened interval may indeed be representative of the formation, depending upon well construction and site hydrogeology. Wells are purged to some extent for the following reasons: the presence of the air interface at the top of the water column resulting in an oxygen concentration gradient with depth, loss of volatiles up the water column, leaching from or sorption to the casing or filter pack, chemical changes due to clay seals or backfill, and surface infiltration.

Low-flow purging, whether using portable or dedicated systems, should be done using pump-intake located in the middle or slightly above the middle of the screened interval. Placement of the pump too close to the bottom of the well will cause increased entrainment of solids which have collected in the well over time. These particles are present as a result of well development, prior purging and sampling events, and natural colloidal transport and deposition. Therefore, placement of the pump in the middle or toward the top of the screened interval is suggested. Placement of the pump at the top of the water column for sampling is only recommended in unconfined aquifers, screened across the water table, where this is the desired sampling point. Low-

flow purging has the advantage of minimizing mixing between the overlying stagnant casing water and water within the screened interval.

A. Low-Flow Purging and Sampling

Low-flow refers to the velocity with which water enters the pump intake and that is imparted to the formation pore water in the immediate vicinity of the well screen. It does not necessarily refer to the flow rate of water discharged at the surface which can be affected by flow regulators or restrictions. Water level drawdown provides the best indication of the stress imparted by a given flow-rate for a given hydrological situation. The objective is to pump in a manner that minimizes stress (drawdown) to the system to the extent practical taking into account established site sampling objectives. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology. Some extremely coarse-textured formations have been successfully sampled in this manner at flow rates to 1 L/min. The effectiveness of using low-flow purging is intimately linked with proper screen location, screen length, and well construction and development techniques. The reestablishment of natural flow paths in both the vertical and horizontal directions is important for correct interpretation of the data. For high resolution sampling needs, screens less than 1 m should be used. Most of the need for purging has been found to be due to passing the sampling device through the overlying casing water which causes mixing of these stagnant waters and the dynamic waters within the screened interval. Additionally, there is disturbance to suspended sediment collected in the bottom of the casing and the displacement of water out into the formation immediately adjacent to the well screen. These disturbances and impacts can be avoided using dedicated sampling equipment, which precludes the need to insert the sampling device prior to purging and sampling.

Isolation of the screened interval water from the overlying stagnant casing water may be accomplished using low-flow minimal drawdown techniques. If the pump intake is located within the screened interval, most of the water pumped will be drawn in directly from the formation with little mixing of casing water or disturbance to the sampling zone. However, if the wells are not constructed and developed properly, zones other than those intended may be sampled. At some sites where geologic heterogeneities are sufficiently different within the screened interval, higher conductivity zones may be preferentially sampled. This is another reason to use shorter screened intervals, especially where high spatial resolution is a sampling objective.

B. Water Quality Indicator Parameters

It is recommended that water quality indicator parameters be used to determine purging needs prior to sample collection in each well. Stabilization of parameters such as pH, specific conductance, dissolved oxygen, oxidation-reduction potential, temperature and turbidity should be used to determine when formation water is accessed during purging. In general, the order of stabilization is pH, temperature, and specific conductance, followed by oxidation-reduction potential, dissolved oxygen and turbidity. Temperature and pH, while commonly used as purging indicators, are actually quite insensitive in distinguishing between formation water and stagnant casing water; nevertheless, these are important parameters for data interpretation purposes and should also be measured. Performance criteria for determination of stabilization should be based on water-level drawdown, pumping rate and equipment specifications for measuring indicator parameters. Instruments are available which utilize in-line flow cells to continuously measure the above parameters.

It is important to establish specific well stabilization criteria and then consistently follow the same methods thereafter, particularly with respect to drawdown, flow rate and sampling device. Generally, the time or purge volume required for parameter stabilization is independent of well depth or well volumes. Dependent variables are well diameter, sampling device, hydrogeochemistry, pump flow rate, and whether the devices are used in a portable or dedicated manner. If the sampling device is already in place (i.e., dedicated sampling systems), then the time and purge volume needed for stabilization is much shorter. Other advantages of dedicated equipment include less purge water for waste disposal, much less decontamination of equipment, less time spent in preparation of sampling as well as time in the field, and more consistency in the sampling approach which probably will translate into less variability in sampling results. The use of dedicated equipment is strongly recommended at wells which will undergo routine sampling over time.

If parameter stabilization criteria are too stringent, then minor oscillations in indicator parameters may cause purging operations to become unnecessarily protracted. It should also be noted that turbidity is a very conservative parameter in terms of stabilization. Turbidity is always the last parameter to stabilize. Excessive purge times are invariably related to the establishment of too stringent turbidity stabilization criteria. It should be noted that natural turbidity levels in ground water may exceed 10 nephelometric turbidity units (NTU).

C. Advantages and Disadvantages of Low-Flow (Minimum Drawdown) Purging

In general, the advantages of low-flow purging include:

- samples which are representative of the *mobile* load of contaminants present (dissolved and colloid-associated);
- minimal disturbance of the sampling point thereby minimizing sampling artifacts;
- less operator variability, greater operator control;

- reduced stress on the formation (minimal drawdown);
- less mixing of stagnant casing water with formation water;
- reduced need for filtration and, therefore, less time required for sampling;
- smaller purging volume which decreases waste disposal costs and sampling time;
- better sample consistency; reduced artificial sample variability.

Some disadvantages of low-flow purging are:

- higher initial capital costs,
- greater set-up time in the field,
- need to transport additional equipment to and from the site,
- increased training needs,
- resistance to change on the part of sampling practitioners,
- concern that new data will indicate a *change in conditions* and trigger an *action*.

IV. Low-Flow (Minimal Drawdown) Sampling Protocols

The following ground-water sampling procedure has evolved over many years of experience in ground-water sampling for organic and inorganic compound determinations and as such summarizes the authors' (and others) experiences to date (Barcelona et al., 1984, 1994; Barcelona and Helfrich, 1986; Puls and Barcelona, 1989; Puls et. al. 1990, 1992; Puls and Powell, 1992; Puls and Paul, 1995). High-quality chemical data collection is essential in ground-water monitoring and site characterization. The primary limitations to the collection of *representative* ground-water samples include: mixing of the stagnant casing and *fresh* screen waters during insertion of the sampling device or ground-water level measurement device; disturbance and resuspension of settled solids at the bottom of the well when using high pumping rates or raising and lowering a pump or bailer; introduction of atmospheric gases or degassing from the water during sample handling and transfer, or inappropriate use of vacuum sampling device, etc.

A. Sampling Recommendations

Water samples should not be taken immediately following well development. Sufficient time should be allowed for the ground-water flow regime in the vicinity of the monitoring well to stabilize and to approach chemical equilibrium with the well construction materials. This lag time will depend on site conditions and methods of installation but often exceeds one week.

Well purging is nearly always necessary to obtain samples of water flowing through the geologic formations in the screened interval. Rather than using a general but arbitrary guideline of purging three casing volumes prior to sampling, it is recommended that an in-line water quality measurement device (e.g., flow-through cell) be used to establish the stabilization time for several parameters (e.g. , pH, specific conductance, redox, dissolved oxygen, turbidity) on a well-specific basis. Data on pumping rate, drawdown, and volume required for parameter stabilization can be used as a guide for conducting subsequent sampling activities.

The following are recommendations to be considered before, during and after sampling:

- use low-flow rates (<0.5 L/min), during both purging and sampling to maintain minimal drawdown in the well;
- maximize tubing wall thickness, minimize tubing length;
- place the sampling device intake at the desired sampling point;
- minimize disturbances of the stagnant water column above the screened interval during water level measurement and sampling device insertion;
- make proper adjustments to stabilize the flow rate as soon as possible;
- monitor water quality indicators during purging;
- collect unfiltered samples to estimate contaminant loading and transport potential in the subsurface system.

B. Equipment Calibration

Prior to sampling, all sampling device and monitoring equipment should be calibrated according to manufacturer's recommendations and the site Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP). Calibration of pH should be performed with at least two buffers which bracket the expected range. Dissolved oxygen calibration must be corrected for local barometric pressure readings and elevation.

C. Water Level Measurement and Monitoring

It is recommended that a device be used which will least disturb the water surface in the casing. Well depth should be obtained from the well logs. Measuring to the bottom of the well casing will only cause resuspension of settled solids from the formation and require longer purging times for turbidity equilibration. Measure well depth after sampling is completed. The water level measurement should be taken from a permanent reference point which is surveyed relative to ground elevation.

D. Pump Type

The use of low-flow (e.g., 0.1-0.5 L/min) pumps is suggested for purging and sampling all types of analytes. All pumps have some limitation and these should be investigated with respect to application at a particular site. Bailers are inappropriate devices for low-flow sampling.

1) General Considerations

There are no unusual requirements for ground-water sampling devices when using low-flow, minimal drawdown techniques. The major concern is that the device give consistent results and minimal disturbance of the sample across a range of *low* flow rates (i.e., < 0.5 L/min). Clearly, pumping rates that cause minimal to no drawdown in one well could easily cause *significant* drawdown in another well finished in a less transmissive formation. In this sense, the pump should not cause undue pressure or temperature changes or physical disturbance on the water sample over a reasonable sampling range. Consistency in operation is critical to meet accuracy and precision goals.

2) Advantages and Disadvantages of Sampling Devices

A variety of sampling devices are available for low-flow (minimal drawdown) purging and sampling and include peristaltic pumps, bladder pumps, electrical submersible pumps, and gas-driven pumps. Devices which lend themselves to both dedication and consistent operation at definable low-flow rates are preferred. It is desirable that the pump be easily adjustable and operate reliably at these lower flow rates. The peristaltic pump is limited to shallow applications and can cause degassing resulting in alteration of pH, alkalinity, and some volatiles loss. Gas-driven pumps should be of a type that does not allow the gas to be in direct contact with the sampled fluid.

Clearly, bailers and other *grab* type samplers are ill-suited for low-flow sampling since they will cause repeated disturbance and mixing of *stagnant* water in the casing and the *dynamic* water in the screened interval. Similarly, the use of inertial lift foot-valve type samplers may cause too much disturbance at the point of sampling. Use of these devices also tends to introduce uncontrolled and unacceptable operator variability.

Summaries of advantages and disadvantages of various sampling devices are listed in Herzog et al. (1991), U. S. EPA (1992), Parker (1994) and Thurnblad (1994).

E. Pump Installation

Dedicated sampling devices (left in the well) capable of pumping and sampling are preferred over <u>any</u> other type of device. Any portable sampling device should be slowly and carefully lowered to the middle of the screened interval or slightly above the middle (e.g., 1-1.5 m below the top of a 3 m screen). This is to minimize excessive mixing of the stagnant water in the casing above the screen with the screened interval zone water, and to minimize resuspension of solids which will have collected at the bottom of the well. These two disturbance effects have been shown to directly affect the time required for purging. There also appears to be a direct correlation between size of portable sampling devices relative to the well bore and resulting purge volumes and times. The key is to minimize disturbance of water and solids in the well casing.

F. Filtration

Decisions to filter samples should be dictated by sampling objectives rather than as a *fix* for poor sampling practices, and field-filtering of certain constituents should not be the default. Consideration should be given as to what the application of field-filtration is trying to accomplish. For assessment of truly dissolved (as opposed to operationally *dissolved* [i.e., samples filtered with 0.45 µm filters]) concentrations of major ions and trace metals, 0.1 µm filters are recommended although 0.45 µm filters are normally used for most regulatory programs. Alkalinity samples must also be filtered if significant particulate calcium carbonate is suspected, since this material is likely to impact alkalinity titration results (although filtration itself may alter the CO_2 composition of the sample and, therefore, affect the results).

Although filtration may be appropriate, filtration of a sample may cause a number of unintended changes to occur (e.g. oxidation, aeration) possibly leading to filtration-induced artifacts during sample analysis and uncertainty in the results. Some of these unintended changes may be unavoidable but the factors leading to them must be recognized. Deleterious effects can be minimized by consistent application of certain filtration guidelines. Guidelines should address selection of filter type, media, pore size, etc. in order to identify and minimize potential sources of uncertainty when filtering samples.

In-line filtration is recommended because it provides better consistency through less sample handling, and minimizes sample exposure to the atmosphere. In-line filters are available in both disposable (barrel filters) and non-disposable (in-line filter holder, flat membrane filters) formats and various filter pore sizes (0.1-5.0 µm). Disposable filter cartridges have the advantage of greater sediment handling capacity when compared to traditional membrane filters. Filters must be pre-rinsed following manufacturer's recommendations. If there are no recommendations for rinsing, pass through a minimum of 1 L of ground water following purging and prior to sampling. Once filtration has begun, a filter cake may develop as particles larger than the pore size accumulate on the filter membrane. The result is that the effective pore diameter of the membrane is reduced and particles smaller than the stated pore size are excluded from the filtrate. Possible corrective measures include prefiltering (with larger pore size filters), minimizing particle loads to begin with, and reducing sample volume.

G. Monitoring of Water Level and Water Quality Indicator Parameters

Check water level periodically to monitor drawdown in the well as a guide to flow rate adjustment. The goal is minimal drawdown (<0.1 m) during purging. This goal may be difficult to achieve under some circumstances due to geologic heterogeneities within the screened interval, and may require adjustment based on site-specific conditions and personal experience. In-line water quality indicator parameters should be continuously monitored during purging. The water quality

indicator parameters monitored can include pH, redox potential, conductivity, dissolved oxygen (DO) and turbidity. The last three parameters are often most sensitive. Pumping rate, drawdown, and the time or volume required to obtain stabilization of parameter readings can be used as a future guide to purge the well. Measurements should be taken every three to five minutes if the above suggested rates are used. Stabilization is achieved after all parameters have stabilized for three successive readings. In lieu of measuring all five parameters, a minimum subset would include pH, conductivity, and turbidity or DO. Three successive readings should be within ± 0.1 for pH, ± 3% for conductivity, ± 10 mv for redox potential, and ± 10% for turbidity and DO. Stabilized purge indicator parameter trends are generally obvious and follow either an exponential or asymptotic change to stable values during purging. Dissolved oxygen and turbidity usually require the longest time for stabilization. The above stabilization guidelines are provided for rough estimates based on experience.

H. Sampling, Sample Containers, Preservation and Decontamination

Upon parameter stabilization, sampling can be initiated. If an in-line device is used to monitor water quality parameters, it should be disconnected or bypassed during sample collection. Sampling flow rate may remain at established purge rate or may be adjusted slightly to minimize aeration, bubble formation, turbulent filling of sample bottles, or loss of volatiles due to extended residence time in tubing. Typically, flow rates less than 0.5 L/min are appropriate. The same device should be used for sampling as was used for purging. Sampling should occur in a progression from least to most contaminated well, if this is known. Generally, volatile (e.g., solvents and fuel constituents) and gas sensitive (e.g., Fe^{2+}, CH_4, H_2S/HS^-, alkalinity) parameters should be sampled first. The sequence in which samples for most inorganic parameters are collected is immaterial unless filtered (dissolved) samples are desired. Filtering should be done last and in-line filters should be used as discussed above. During both well purging and sampling, proper protective clothing and equipment must be used based upon the type and level of contaminants present.

The appropriate sample container will be prepared in advance of actual sample collection for the analytes of interest and include sample preservative where necessary. Water samples should be collected directly into this container from the pump tubing.

Immediately after a sample bottle has been filled, it must be preserved as specified in the site (QAPP). Sample preservation requirements are based on the analyses being performed (use site QAPP, FSP, RCRA guidance document [U. S. EPA, 1992] or EPA SW-846 [U. S. EPA, 1982]). It may be advisable to add preservatives to sample bottles in a controlled setting prior to entering the field in order to reduce the chances of improperly preserving sample bottles or introducing field contaminants into a sample bottle while adding the preservatives.

The preservatives should be transferred from the chemical bottle to the sample container using a disposable polyethylene pipet and the disposable pipet should be used only once and then discarded.

After a sample container has been filled with ground water, a Teflon™ (or tin)-lined cap is screwed on tightly to prevent the container from leaking. A sample label is filled out as specified in the FSP. The samples should be stored inverted at 4°C.

Specific decontamination protocols for sampling devices are dependent to some extent on the type of device used and the type of contaminants encountered. Refer to the site QAPP and FSP for specific requirements.

I. Blanks

The following blanks should be collected:

(1) field blank: one field blank should be collected from each source water (distilled/deionized water) used for sampling equipment decontamination or for assisting well development procedures.

(2) equipment blank: one equipment blank should be taken prior to the commencement of field work, from each set of sampling equipment to be used for that day. Refer to site QAPP or FSP for specific requirements.

(3) trip blank: a trip blank is required to accompany each volatile sample shipment. These blanks are prepared in the laboratory by filling a 40-mL volatile organic analysis (VOA) bottle with distilled/deionized water.

V. Low-Permeability Formations and Fractured Rock

The overall sampling program goals or sampling objectives will drive how the sampling points are located, installed, and choice of sampling device. Likewise, site-specific hydrogeologic factors will affect these decisions. Sites with very low permeability formations or fractures causing discrete flow channels may require a unique monitoring approach. Unlike water supply wells, wells installed for ground-water quality assessment and restoration programs are often installed in low water-yielding settings (e.g., clays, silts). Alternative types of sampling points and sampling methods are often needed in these types of environments, because low-permeability settings may require extremely low-flow purging (<0.1 L/min) and may be technology-limited. Where devices are not readily available to pump at such low flow rates, the primary consideration is to avoid dewatering of

the well screen. This may require repeated recovery of the water during purging while leaving the pump in place within the well screen.

Use of low-flow techniques may be impractical in these settings, depending upon the water recharge rates. The sampler and the end-user of data collected from such wells need to understand the limitations of the data collected; i.e., a strong potential for underestimation of actual contaminant concentrations for volatile organics, potential false negatives for filtered metals and potential false positives for unfiltered metals. It is suggested that comparisons be made between samples recovered using low-flow purging techniques and samples recovered using passive sampling techniques (i.e., two sets of samples). Passive sample collection would essentially entail acquisition of the sample with no or very little purging using a dedicated sampling system installed within the screened interval or a passive sample collection device.

A. Low-Permeability Formations (<0.1 L/min recharge)

1. Low-Flow Purging and Sampling with Pumps

a. "portable or non-dedicated mode" - Lower the pump (one capable of pumping at <0.1 L/min) to mid-screen or slightly above and set in place for minimum of 48 hours (to lessen purge volume requirements). After 48 hours, use procedures listed in Part IV above regarding monitoring water quality parameters for stabilization, etc., but do not dewater the screen. If excessive drawdown and slow recovery is a problem, then alternate approaches such as those listed below may be better.

b. "dedicated mode" - Set the pump as above at least a week prior to sampling; that is, operate in a dedicated pump mode. With this approach significant reductions in purge volume should be realized. Water quality parameters should stabilize quite rapidly due to less disturbance of the sampling zone.

2. Passive Sample Collection

Passive sampling collection requires insertion of the device into the screened interval for a sufficient time period to allow flow and sample equilibration before extraction for analysis. Conceptually, the extraction of water from low yielding formations seems more akin to the collection of water from the unsaturated zone and passive sampling techniques may be more appropriate in terms of obtaining "representative" samples. Satisfying usual sample volume requirements is typically a problem with this approach and some latitude will be needed on the part of regulatory entities to achieve sampling objectives.

B. Fractured Rock

In fractured rock formations, a low-flow to zero purging approach using pumps in conjunction with packers to isolate the sampling zone in the borehole is suggested. Passive multi-layer sampling devices may also provide the most "representative" samples. It is imperative in these settings to identify flow paths or water-producing fractures prior to sampling using tools such as borehole flowmeters and/or other geophysical tools.

After identification of water-bearing fractures, install packer(s) and pump assembly for sample collection using low-flow sampling in "dedicated mode" or use a passive sampling device which can isolate the identified water-bearing fractures.

VI. Documentation

The usual practices for documenting the sampling event should be used for low-flow purging and sampling techniques. This should include, at a minimum: information on the conduct of purging operations (flow-rate, drawdown, water-quality parameter values, volumes extracted and times for measurements), field instrument calibration data, water sampling forms and chain of custody forms. See Figures 2 and 3 and "Ground Water Sampling Workshop -- A Workshop Summary" (U. S. EPA, 1995) for example forms and other documentation suggestions and information. This information coupled with laboratory analytical data and validation data are needed to judge the "useability" of the sampling data.

VII. Notice

The U.S. Environmental Protection Agency through its Office of Research and Development funded and managed the research described herein as part of its in-house research program and under Contract No. 68-C4-0031 to Dynamac Corporation. It has been subjected to the Agency's peer and administrative review and has been approved for publication as an EPA document. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

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Figure 2. **Ground Water Sampling Log**

Project _____ **Site** _____ **Well No.** _____ **Date** _____
Well Depth _____ **Screen Length** _____ **Well Diameter** _____ **Casing Type** _____
Sampling Device _____ **Tubing type** _____ **Water Level** _____
Measuring Point _____ **Other Infor** _____

_____

Sampling Personnel _____

Time	pH	Temp	Cond.	Dis.O_2	Turb.	[ ]Conc			Notes

Type of Samples Collected

_____

Information: 2 in = 617 ml/ft, 4 in = 2470 ml/ft: $Vol_{cyl} = \pi r^2 h$, $Vol_{sphere} = 4/3\pi r^3$

Figure 3. **Ground Water Sampling Log** (with automatic data logging for most water quality parameters)

Project _____ **Site** _____ **Well No.** _____ **Date** _____
Well Depth _____ **Screen Length** _____ **Well Diameter** _____ **Casing Type** _____
Sampling Device _____ **Tubing type** _____ **Water Level** _____
Measuring Point _____ **Other Infor** _____

_____

Sampling Personnel _____

Time	Pump Rate	Turbidity	Alkalinity	[ ] Conc	Notes

Type of Samples Collected

_____

Information: 2 in = 617 ml/ft, 4 in = 2470 ml/ft: $Vol_{cyl} = \pi r^2 h$, $Vol_{sphere} = 4/3\pi r^3$

Appendix E

Explosive Gas Monitoring Plan

Appendix F

Surface Water System Design Report

Appendix G

Quality Assurance/Quality Control Plan for Liner and Leachate Collection System Installation and Testing

Appendix H

Leachate Collection System Design Report

Appendix I

Operations Plan

Operations Plan
American Environmental Landfill

American Environmental Landfill, Inc.
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Sand Springs, Oklahoma 74063

SCS ENGINEERS

27220345.00 | May 2024
Revised February 2025

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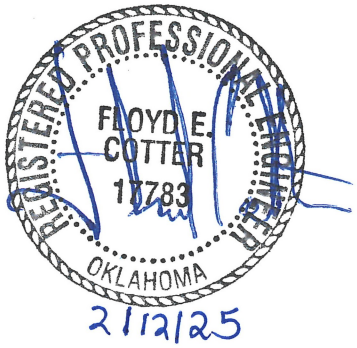
CERTIFICATION

This report has been prepared for exclusive use by American Environmental Landfill, Inc. for the American Environmental Landfill (AEL) for specific application to the project discussed, and it has been prepared in accordance with good engineering practices including consideration of industry standards and the requirements of the Oklahoma Department of Environmental Quality.

Prepared by:



Floyd Cotter, PE
SCS Engineers

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Appendix C Paint Filter Liquids Test Procedure
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1.0 INTRODUCTION

This Operations Plan (Plan) is intended to assist the operators of the American Environmental Landfill (AEL) in operating the facility in accordance with the solid waste permit documents and Oklahoma Administrative Code (OAC) Rules and Regulations as promulgated by the Oklahoma Department of Environmental Quality (ODEQ). The AEL is located near Sand Springs, Oklahoma in Sections 35 and 36, Township 20 North, Range 10 East, in Osage County, Oklahoma. The project site is on the Wekiwa Oklahoma 7.5 Minute USGS Quadrangle map. AEL is bordered by the Arkansas River to the South. The AEL operates under the Oklahoma Department of Environmental Quality (ODEQ) Permit Number 3557021.

Any reference to "operator" in this Plan shall mean the individual responsible for the facility on any given day or shift. The individual in responsible charge may assign operational tasks to various personnel. In addition, this Operations Plan shall be available to employees for reference to the operations of the facility. It is the responsibility of AEL to keep this information current. If changes to this Plan are to be made affecting the operations of the facility, then AEL shall notify the DEQ within 5 working days before the change implementation.

1.1 OPERATING HOURS

It is anticipated that the AEL will be open from 7:00 a.m. to 5:00 p.m. Monday through Friday and Saturday from 7:00 a.m. to 3:00 p.m. The daily operation of equipment necessary for compaction and covering waste will normally cease within one hour after the daily closing time.

1.2 PERSONNEL

The operation of the AEL will be under the direction of a certified solid waste operator. The typical staffing level is listed below:

- Landfill Manager/Operator
- Equipment Operator
- Scale House Attendant
- General Maintenance Person
- Truck Drivers

Staff will be modified as necessary to accommodate changes to operations or to meet increased waste flows. A properly trained equipment operator or other landfill employee will be present at the working face of the landfill to observe the unloading of waste and to perform and document random inspections of the waste.

1.3 ACCESS CONTROL

The AEL is located approximately 5.5 miles west of Sand Springs, Oklahoma on State Highway 412. The site is accessed from N. 177th West Ave. The entrance to the landfill is near the center of the property. Per OAC 252:515-19-32, artificial and/or natural barriers shall be used to discourage unauthorized traffic and uncontrolled dumping. Access to the landfill is controlled by a lockable entrance gate. The AEL is also surrounded by dense vegetation, rocky outcrops, and an iron fence.

This provides a natural and artificial barrier around the site that discourages access to unauthorized traffic. Landfill personnel have appropriately placed signs directing waste-hauling vehicles to the working face of the landfill. Scale house and operating personnel shall prohibit any unauthorized access and shall record all incidences of unauthorized access. At the conclusion of each operating day, the entrance gate shall be locked to prohibit vehicle access.

2.0 SOLID WASTE ACCEPTED/EXCLUDED

This section outlines accepted and excluded wastes, waste screening procedures, waste measuring requirements, and quantity limitation requirements which are applicable to the AEL under OAC 252:515.

2.1 WASTE ACCEPTANCE AND EXCLUSION

Under solid waste disposal permit number 3557021, the AEL is permitted to accept and manage solid waste, non-hazardous industrial waste (both liquid and solid), and contaminated soil with no TPH restrictions. AEL also accepts municipal and industrial sludge, both friable and non-friable asbestos, and other non-hazardous industrial waste (NHIW). Municipal sewage sludge treated to Class B requirements, as described in 40 CFR 503.32(b), may be disposed at the AEL if the sludge passes the Paint Filter Liquids Test (PFLT). A procedure for the PFLT is included in Appendix C of this Plan. In addition, the AEL has received approval from the EPA to accept CERCLA waste in Subtitle D areas of the permit waste footprint. The disposal of any quantity of hazardous, radioactive, regulated untreated infectious biomedical waste, or regulated polychlorinated biphenyl (PCB) waste is prohibited at the AEL.

Waste should be visually screened at the scale house to determine if the shipment contains acceptable waste. Shipments received at the facility shall be rejected if the waste is not deemed acceptable. Shipments of waste entering the State of Oklahoma that are subsequently rejected shall be removed from the State by those persons who transported the waste into the State.

Additional information such as sources of waste, amount received, transporters used, and any special handling or management practices to be employed shall be recorded at the scale house and filed within the site's operating record. Detailed information on acceptable and unacceptable wastes; screening procedures; recordkeeping and reporting requirements; and training requirements associated with waste acceptance at the site is detailed in the facility's approved Waste Exclusion Plan, which is maintained in the site's operating record and included as Appendix J of the permit application.

2.2 NHIW MANAGEMENT

Records shall be maintained in the operating record, itemizing the type, quantity, and source of NHIW received from persons disposing greater than 10 cubic yards of NHIW in a calendar month. Such records shall be submitted to the ODEQ no later than the last day of the month following the reporting month.

2.3 WASTE SCREENING

The scale house attendant will be responsible for screening incoming waste so that prohibited wastes are identified and handled properly. If the scale house attendant or other landfill staff refuses such wastes, they will inform customers of the proper disposal alternatives, such as directing them to local facilities that would accept those wastes. This practice is intended to avoid illegal dumping of refused wastes.

Personnel at the site shall conduct routine procedures for the screening and removal of wastes that are not acceptable for receipt at the landfill for disposal. These procedures consist of both routine load screening procedures and random load inspections. Routine load screening procedures include:

- Identifying incoming vehicles by company and vehicle number (Any placards will be noted)
- Review of paperwork included with incoming wastes by the scale house attendant
- Visually inspecting each load as it is pushed into the working face by operators trained to recognize excluded waste
- Notifying the ODEQ if unacceptable waste is discovered at the site by the end of the next working day. (The site's current Waste Exclusion Plan should be referenced for information to include with the notification)

Random load inspections will consist of:

- Conducting random inspections of incoming loads for unacceptable wastes
- Inspection of vehicles that contain uncompacted or open-top loads will primarily occur at the scale house
- Enclosed vehicles, such as commercial refuse vehicles, will be inspected at the working face
- Loads will be visually observed for unacceptable waste when deposited at the toe of the working face by a landfill employee
- Maintained records should include, at a minimum, the company or person delivering the waste, type of vehicle, rate and time, type of waste delivered, and person performing the inspection. These records shall be maintained in the operating record of the facility

Should a particular hauler or refuse from a particular waste generator be suspected of being a source of prohibited waste, routine or planned inspections will be made of the suspected waste at a pull-off area near the truck scale. The facility's current Waste Exclusion Plan should be referenced for waste screening training requirements as well as additional information regarding the waste screening procedures at the AEL.

2.4 WASTE MEASURING

The scale house at the AEL is located on the site's access road east of the active disposal area. All waste delivered to and disposed of at the AEL is weighed on a certified scale. The scale is tested and certified annually in accordance with the requirements of the Oklahoma Department of Agriculture, Food, and Forestry (ODAFF) per OAC 252:515-19-33(a)(2). The AEL should request the ODAFF to test the weighing and measuring of the scale on an annual basis.

If the scale is inoperative, tonnage shall be estimated on a volume basis where one cubic yard of waste shall be calculated to weigh one-third (1/3) ton. Solid waste disposal fees shall be collected and remitted to the ODEQ, except for solid waste received from emergencies or other special events, with prior approval from the ODEQ. Monthly reports shall be filed in the operating record and submitted to the ODEQ no later than the 15th of the month following the reporting period using the online reporting tool. A link to the online reporting tool is located *here*. A copy of the monthly and quarterly reporting forms are included in Appendix A of this Plan. Copies of submitted forms should be maintained in the site's operating record.

2.5 LIMITATIONS ON WASTE RECEIVED

The AEL accepts approximately 2,215 tons per day of waste. Therefore, the facility is required to prepare a Vegetative Cover Plan under OAC 252:515-19-54. Section 8.4 outlines how vegetative cover will be established and sets forth the timeline in which to do so.

As set forth by OAC 252:515-19-34 (c)(3), because the AEL will be constructed of an approved composite liner and leachate collection system, the AEL does not need to prepare a Disposal Plan as required under OAC 252-515-19-34(d).

2.6 RECYCLING OPERATIONS

The site proposes to salvage/recycle landfilled material that is deemed to be salvageable or recyclable. The recycling/salvage operations will be conducted as outlined in the AEL Salvage and Recycling Plan, included in Appendix D.

3.0 SURVEY CONTROL

Horizontal and vertical control must be maintained at the landfill in order to construct the landfill according to the approved permit documents. All boundary markers, benchmarks, horizontal control stations, and construction stakes will be clearly marked and identified. Permanent monuments designating horizontal and vertical control are already in place at the landfill in the form of monuments with surveyed, permanently stamped information. Evidence of permanent monuments and boundary markers placed by a registered land surveyor are shown on the approved Permit Documents maintained in the facility's operating record.

Permanent vertical control has been established by a registered surveyor on the property. In the event a control monument is damaged or destroyed, a registered land surveyor shall re-establish the monument. The permanent monuments at the property corners are established with markers embedded in concrete or other similar-type permanent structures. Boundary markers have been established designating the entire permitted acreage.

Construction staking will be used to mark individual cells where waste is to be placed. Staking will be utilized during landfilling operations to maintain slopes and check filling elevations, as necessary. Stakes will generally be made of wood or some other suitable material for use in a landfill. Construction stakes and temporary benchmarks will be replaced during the landfill operations, as needed.

If established benchmark or horizontal control monuments are disturbed over the life of the facility, these monuments shall be replaced or re-established by or under the supervision of a registered land surveyor.

4.0 WET WEATHER MANAGEMENT

Wet weather should not adversely impact landfill operations due to all-weather access roads. Throughout the landfill operation, adequate temporary landfill roads will be constructed to allow access to the working face of the landfill during all weather conditions. Soil material from the borrow area will be utilized to meet daily cover requirements during wet weather.

5.0 LINER SYSTEM

The liner system at the AEL will be constructed in accordance with the approved Quality Assurance/Quality Control (QA/QC) Plan for Liner and Leachate Collection System Installation and Testing. Liner system material conformance testing, general construction procedures, and testing requirements are presented in the QA/QC Plan. Each portion of the liner must be constructed under the supervision of a professional engineer licensed in the state of Oklahoma. Before waste can be placed in any newly constructed cell, approval of a Liner Installation and Testing Report must be obtained from the ODEQ.

6.0 LEACHATE COLLECTION AND STORAGE

The slope of the bottom of the landfill will allow leachate to be directed to leachate sumps located at the perimeter of the landfill. To facilitate leachate drainage toward the leachate sumps, the geomembrane liner will be covered with an 8-oz/sq yd non-woven geotextile cushion and a 24-inch thick leachate collection/protective cover. Leachate collection pipes will be placed in each drainage area to intercept leachate and transport it to a collection sump. The leachate collection system will be equipped with a pressure transducer, leachate level readout, and high-level alarm to monitor leachate levels. The sump pump will be manually engaged on a daily basis, if needed, to keep leachate levels below one foot above the top of the sump. As-builts for the sumps will be included in the Liner Installation and Testing (LIT) report, which will be submitted to the ODEQ upon construction.

Per OAC 252:515-13-34, the leachate collection pipes shall be cleaned out after the placement of the protective cover layer, again after the placement of the first lift of waste, and once per year thereafter.

Removal of leachate by a leachate collection system will eliminate the pressure head that would be necessary to force leachate through the composite liner. Prior to the placement of waste, traffic will be routed to minimize its detrimental impact on the constructed liner. Additionally, care will be taken when the initial lift of waste is placed in the landfill to avoid large or sharp objects that might damage the liner.

During the active life of the landfill, leachate collected in the sumps within the expansion area will be pumped up the side slope to the dual-contained force main and transported via the dual-contained force main to the proposed leachate storage impoundment. Leachate stored in the leachate storage impoundments will be evaporated, recirculated, and/or hauled offsite for disposal. Leachate recirculation will occur in accordance with the Leachate Recirculation Plan.

7.0 LANDFILLING PROCEDURES

7.1 LANDFILL PROGRESSION AND SEQUENCE OF FILL

Refuse trucks will deposit waste in the area identified as the working face. The working face is a sloped surface upon which the waste is compacted in layers. The waste is compacted by the landfill compactor as it is spread. The slope of the working face will vary based on the location of the slope. For sloped areas located at the limits of the permitted boundary or adjoining an area not proposed to accept waste, the slope will be no more than four feet horizontal to one foot vertical (4:1). For sloped areas located at adjoining areas within the permitted boundary proposed to accept waste, the slope will be no more than three-feet horizontal to one-foot vertical (3:1). The compactor will make multiple passes over the waste layer until the waste rebounds the same amount that it was depressed by the compactor. The height of waste will generally not exceed fifteen feet in height and is referred to as a lift. The width of the working face will be kept as small as practical. The waste will be spread and compacted as it is received.

Under the area fill method, waste is placed next to the previous day's waste until an established row length is reached. Another row is then started parallel to the previously constructed row. As the rows form lifts over each area, the top of each landfill lift should slope in such a manner as to allow surface runoff to drain away from the working face. After a number of rows have been constructed (creating a lift), a second lift is constructed over the first lift. Waste placement will alternate between various lifts of waste and will allow landfill traffic to discharge waste at various levels. This method will allow the earthmoving equipment to stockpile daily cover at the top of the day's waste, if necessary.

When the last load of refuse for the day has been spread and compacted, the application of 6 inches of daily cover soil or an alternative daily cover (ADC) will begin (see Section 8.1). Waste will not be placed in areas where the presence of water would prohibit proper spreading of the waste or promote a mosquito problem.

7.1.1 Placement of Initial Layer of Waste

Upon completion of cell construction and receipt of approval from the ODEQ, the landfill may begin placing waste in a new disposal cell. Filling should begin at the lowest elevations of each cell and work toward higher elevations to prevent excess leachate generation. The initial lift of waste placed in a cell should be comprised of "select" waste that will not damage the composite liner system and will provide an additional protective layer against freeze/thaw effects. This lift of select waste should be comprised of waste that does not contain long, sharp objects, or bulky material. When placing this select waste lift, a compactor should not be used until a minimum of five feet of waste has been placed over the drainage/protective cover layer. A track dozer can be used to spread waste into the cell while operating on already-placed waste.

7.1.2 Placement of Bulky Solid Wastes

Bulky waste should be crushed on the ground surface and then pushed onto the working face near the bottom of the fill area. Bulky waste that cannot be crushed should be placed near the bottom of the cell, though not in the first lift of waste.

7.1.3 Proper Disposal of Dead Animals

Dead animals accepted for disposal should be covered with solid waste or cover soil immediately upon placement at the active face.

7.1.4 Stormwater Management

Per OAC 252:515-19-38(a), solid waste shall not be placed or allowed to enter, accidentally or otherwise, waters that communicate with waters of the state located outside the permit boundary. Stormwater that accumulates in or near the active landfill area will be managed to minimize contact with the working face or other exposed waste. Temporary berms will be constructed along the perimeter of each disposal cell to direct potential stormwater run-on to the appropriate stormwater ditches or structures and to prevent stormwater run-off from the working face of the landfill from intermingling with "clean" stormwater. In addition, temporary stormwater diversion berms or "rain flaps" may be constructed to minimize stormwater that enters the leachate collection system. The construction of such berms or "rain flaps" will be dependent on the rate and location of waste placement within each cell.

7.2 EQUIPMENT

The equipment to be used on the site will include but not necessarily be limited to the following (or equivalent):

- Dozer
- Backhoe
- Haul truck
- Compactor
- Water truck

Available equipment will be modified as necessary to accommodate changes in operations or waste flows. All equipment will receive mechanical service on a routine basis. Fire extinguishers will be provided on all landfill equipment.

The manufacturer's recommendations on equipment maintenance will be followed for each piece of landfill equipment. Regularly scheduled equipment maintenance is essential if the landfill equipment is to be dependable. In addition, at the end of each operating day, the equipment operator will remove the trash that may be lodged in the operating portion of the equipment tracks or the compaction equipment.

8.0 COVER AND BORROW SOIL

8.1 DAILY COVER

Daily soil cover will be applied at the end of each operating day, regardless of weather, as required by ODEQ, to deter disease vectors, fires, odors, and blowing litter. The daily soil cover material should consist of nominally compacted earthen material free of garbage, trash, or other unsuitable material. The minimum thickness of the daily soil cover will be six inches. The frequency of daily cover application may need to be increased in order to provide adequate control of disease vectors, fires, odors, blowing litter, or scavenging.

8.2 INTERMEDIATE COVER

Intermediate cover shall be applied to inactive areas of the landfill that are not protected by the final cover. The intermediate cover shall consist of 12 inches of nominally compacted earthen material free of garbage, trash, or other unsuitable materials.

The AEL may submit a permit modification to the ODEQ to approve the use of an alternative intermediate cover, demonstrating the alternative is capable of controlling disease vectors, fires, odors, and blowing litter without presenting a threat to human health or the environment. If an alternative intermediate cover is approved by the ODEQ for use at the AEL, this Plan should be revised to discuss the use of the approved alternate intermediate cover.

8.3 FINAL COVER

When the landfill has been filled to final waste elevations, the final landfill cap will be constructed. Terraces and stormwater management structures will be constructed at the same time that the landfill cap is installed. The final cover at AEL will be constructed in accordance with the approved Closure and Post-Closure Plan and QA/QC Plan. Cover system material conformance testing, general construction procedures, and testing requirements are presented in the QA/QC Plan.

The final cover will be an evapotranspiration cover system. The cover system will consist of a 12-inch thickness of intermediate cover, a 24-inch vegetation support layer, and a 12-inch vegetation layer (topsoil). Each layer will be constructed to support vegetative growth.

8.4 VEGETATIVE COVER

The vegetative cover must be effective, long-lasting, and capable of self-regeneration and plant succession. Vegetation shall consist of species that are equal or superior to native vegetation during each season of the year. Permanent or interim vegetation shall be established in areas that have been undisturbed for 90 days or more.

Table 1. Typical Seeding Mixtures

Spring/Summer Planting Season (Optimal Time for Planting – April 1 through May 30)

Seed Mixture	Minimum Percent Pure Live Seed Required	Pounds Per Live Seeds Required Per Acre
Common Bermuda Grass	85	12
Blue Stem	65	4
Side Oats Grama	65	6
Rye	85	4
	Total:	**26**

Fall/Winter Planting Season (Optimal Time for Planting – September 1 through February 15)

Seed Mixture	Minimum Percent Pure Live Seed Required	Pounds Per Live Seeds Required Per Acre
Winter Wheat	75	40
Fescue or Rye	85	15
	Total:	**55**

The Typical Seeding Mixtures table shown above lists typical seeding mixtures that will be used for the site during each season and is only provided as a reference. It is understood that a variety of application rates and types of seed mixtures will produce adequate vegetative cover. The seed may be applied to the landfill slopes by various typical application methods such as hydro-mulch or seed drilling.

Fertilizer will be applied to the seeded area as needed. The following typical application method should be used:

- Additional soil will be added to the side slopes, as needed, and the soil will be processed using a disk to prepare the soil for seeding.
- Fertilizer will be applied using a commercial spreader at a rate of approximately 150 pounds per acre (lb/acre), and the soil will be simultaneously disked using a disk harrow. The fertilizer rate may vary. However, an initial rate of 10 (nitrogen) - 20 (phosphate) -10 (potassium) may be used.
- The seed mixture will then be applied using a commercial spreader and the area simultaneously disked using a disk harrow.
- After disking the seeded area, hay will be mulched at a rate of approximately 3 bales (700 to 1,000 lbs each) per acre. To further minimize erosion potential and facilitate moisture retention, the hay will then be "crimped" using a roller to integrate the hay into the soil.

For future areas that will receive final cover, the initial seeding event will occur as follows:

- For the final cover that is constructed in the winter, the initial seeding event will consist of a Fall/Winter seed mix, followed by permanent vegetation using a Spring/Summer seeding mixture.

- For the final cover that is constructed in the spring, the initial seeding event will consist of a Spring/Summer seed mix, followed by permanent vegetation using a Fall/Winter seeding mixture.

Vegetation will be established during the first possible growing season. Maintenance of the permanent vegetation will typically consist of protection, replanting, maintaining existing grades, repair of erosion damage, and mowing. After the seeds have sprouted, the site will inspect the slopes for areas with no grass or with thin grass. These areas will be reseeded, watered, and fertilized to establish an acceptable permanent vegetation layer. If there are areas where establishing vegetation is unsuccessful, an alternative plan will be developed.

To prevent ponding, the final cover gradient on top of the fill (as measured from the center of the fill area to the break in slope between the top and sides of the fill) shall be four (4) percent, unless otherwise approved by the ODEQ. The final side slope gradient shall not exceed twenty-five (25) percent. Final cover surface contours shall prevent ponding water and erosion of fill areas.

The ODEQ shall be notified in writing prior to the beginning of the final closure of the facility or closure of a disposal cell. Closure activities shall begin no later than 90 days after the final receipt of wastes at the facility or final receipt of wastes into a disposal cell, as applicable. Closure activities shall be completed within 180 days after closure activities are initiated. Extensions of the closure period may be granted by the ODEQ if the AEL demonstrates that closure will, of necessity, take longer than 180 days and that all steps have been taken, and will continue to be taken, to prevent threats to human health or the environment from the cell or facility.

Upon closing the facility, the AEL shall have a licensed surveyor's plat of the site prepared. The survey plat and detailed description will show, at a minimum, the final contours of the entire site; the permit boundary and boundaries of the disposal areas; the location of gas monitoring wells and extraction systems; the location of groundwater monitoring wells; the location of leachate management systems or surface impoundments; the location of permanent surface drainage structures; aesthetic enhancements; and other relevant information. The site's approved Closure and Post-Closure Plan should be referenced for additional information required for a Certification of Final Closure submittal.

8.5 BORROW SOURCE

Borrow areas for the AEL are located in the expansion area and south of the permitted waste boundary on property owned by American Environmental Landfill, Inc. Borrow areas that are no longer active shall be reshaped and re-vegetated or otherwise reclaimed to blend with surrounding terrain within 180 days of the date the area ceased being used. Borrow areas shall be maintained as outlined in the site's current Stormwater Pollution Prevention Plan (SWP3).

9.0 VECTORS AND AESTHETICS

9.1 VECTORS

In general, vectors will not find suitable harborage in the landfill due to the compaction and covering of the waste. However, if a vector problem should arise, an assessment of the operating conditions will be made and necessary corrective actions will be taken. If the vector problem persists after initial corrective action, a professional exterminator will be hired to mitigate the problem.

9.2 LITTER CONTROL

The AEL is surrounded by dense vegetation consisting of tall trees that minimize wind speeds and air-blown litter from leaving the site. A street sweeper is available to keep the site and approach roadways clean of litter. Additionally, temporary labor is used to pick up litter as needed.

9.3 SPECIAL COVERING

Waste that is received at the site that may cause a nuisance with blowing litter, dust, or odors will be covered immediately rather than waiting for cover at the end of the day.

10.0 ENVIRONMENTAL MONITORING

10.1 SURFACE WATER MONITORING

Surface water will be monitored in accordance with the site's current SWP3. A copy of the SWP3 should be maintained within the site's operating record.

10.2 STORMWATER STRUCTURE MAINTENANCE

Numerous stormwater drainage control structures will be constructed at the landfill. These structures include perimeter channels, letdown channels, and terraces. Routine maintenance must be conducted on these structures for continued proper operation. These drainage structures will be inspected in accordance with the facility's SWP3. If erosion damage has occurred to a drainage structure, it will be repaired as soon as possible.

Temporary surface run-on and run-off control will be implemented as operationally necessary to reduce the amount of run-on and run-off coming into contact with the active refuse face of the landfill or to reduce erosion from disturbed areas of the site.

10.3 GROUNDWATER MONITORING

Groundwater will be monitored in accordance with the approved Groundwater Monitoring Plan for the site, which is maintained in the facility's operating record.

10.4 GAS MONITORING

Landfill gas will be monitored in accordance with the approved Explosive Gas Monitoring Plan for the site, which is maintained in the facility's operating record.

10.5 LEACHATE MONITORING

Leachate monitoring will be conducted as required for recirculation or by the receiving facility when leachate is hauled offsite for disposal. Results of leachate monitoring will be retained in the operating records of the facility.

11.0 AIR QUALITY

11.1 EMISSION CONTROL

The AEL operates under Operating Permit No. 2018-1562-TVR2 and is subject to 40 CFR Part 60, Subpart XXX regulation. A Gas Collection and Control System is used to capture the gas generated within the landfill footprint.

11.2 DUST CONTROL

The AEL shall be operated to prevent the discharge of visible fugitive dust emissions beyond the property boundaries. Fugitive dust emissions shall not damage or interfere with the use of adjacent properties or cause air quality standards to be exceeded. The AEL should spray haul roads using a water truck, as needed when the facility is in operation. Additionally, open burning of solid waste at the AEL is prohibited.

12.0 SAFETY

12.1 FIRES

Protection against fires shall include providing fire extinguishers on all landfill equipment and proper maintenance and cleaning of the equipment to remove trash that may be ignited by equipment exhaust.

Landfill personnel will be on alert for indications that an arriving load of solid waste may be smoldering or have the potential to ignite. If a smoking or smoldering load is observed, the solid waste will immediately be pushed or directed away from the active working face and spread out as much as possible. A thick layer of soil will then be spread over the solid waste and compacted to effectively smother the fire. The sealed solid waste will be observed for several days, and if signs of smoke appear, more soil will be spread and compacted over the solid waste. It may be necessary to leave the "hot" solid waste sealed for an extended period of time before incorporating it into the active working face.

If an area of the daily cell should ignite or show signs of smoldering, the area will be excavated to remove all of the hot material is segregated from the active face. The excavated solid waste will be pushed as far as possible from the working face and sealed as described above.

12.2 EMERGENCY CONTACTS

In the event of an emergency at the AEL, personnel will dial 911 in order to direct the appropriate assistance to the site. Fire, police, and ambulance assistance is available to the site by dialing 911.

12.3 COMMUNICATION EQUIPMENT

All vehicles, including the compactor, will have a two-way radio capable of communicating with the landfill office. Telephone service is available at the landfill office and can be used for calling emergency equipment (fire, police, or ambulance) in the event of an accident or other emergency. Additional emergency telephone numbers will be clearly posted near the telephone.

12.4 TRAFFIC SIGNS

In addition to the entrance sign described in Section 1.3 of this report, additional signs will be posted as necessary. These signs may include:

- Directions to the active face of the landfill
- Speed limits
- Cautionary signs

13.0 RECORDKEEPING AND REPORTING

The AEL shall maintain operating records at the facility containing records concerning the planning, construction, operation, monitoring, closing, and post-closure monitoring of the facility. Such records shall be maintained until the post-closure monitoring period is terminated. A list of recordkeeping and reporting that should be completed by the AEL is included in the ODEQ Guidance on Recordkeeping and Reporting attached in Appendix B of this plan.

Appendix A

Monthly and Quarterly Reporting Forms

MONTHLY REPORT FOR SOLID WASTE DISPOSAL FACILITIES

(Please see instructions prior to completing this form)

Please Remit Original Report to:
Solid Waste Compliance and Enforcement
Land Protection Division
P. O. Box 1677
Oklahoma City, OK 73101-1677
Solidwastereports@deq.ok.gov

And

Please Remit Copy of Report to:
Revenue Management Section
Administrative Services Division
P.O. Box 2036
Oklahoma City, OK 73101-2036
Bernice.Green@deq.ok.gov

Facility Physical Address: _____

Report month/year: _____
Permit No.: _____

Facility Name: _____

Mailing Address: _____ Phone No.:( )_____

_____ Number of Operating days: _____

Day	(1) Total weight accepted (tons)	(2) Weight which is reused or recycled in accordance with facility permit (tons)	(3) Weight accepted from a DEQ approved emergency or special event (tons)	(4) Weight accepted from large industrial waste generators with DEQ exemption certificate (tons)	(5) Time scales placed out-of-service	(6) Time scales placed into service	(7) Total volume accepted (yd^3)	(8) Volume which is reused or recycled in accordance with facility permit (yd^3)	(9) Volume accepted from a DEQ approved emergency or special event (yd^3)	(10) Volume accepted from large industrial waste generators with DEQ exemption certificate (yd^3)
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
Total	0	0	0	0	0	0	0	0	0	0

I hereby certify that the information reported above is accurate and correct to the best of my knowledge and includes all solid waste received at this facility.

Signature of authorized agent: _____ Date: _____

INSTRUCTIONS FOR COMPLETING THE MONTHLY REPORT FOR SOLID WASTE DISPOSAL FACILITIES

The monthly report for solid waste disposal facilities should be submitted to DEQ no later than the 15th of the month following the reporting month and should include all solid waste received during the month. **If no solid waste is received in a given month, a monthly report is still required. Please include a notation that no solid waste was received during the month. If submitting report electronically, please send to solidwastereports@deq.ok.gov and bernice.green@deq.ok.gov.**

1. In the spaces provided, enter the month and year covered by the report, the facility name, permit number, mailing address, and phone number.

2. For each operating day of the month, provide the following and identify which days during the month the facility was closed.

Column 1: **Total weight accepted:** Enter the total weight, **in tons,** of all waste accepted at the facility for each day. The total must include weights to be reported in columns 2, 3, and 4.

Column 2: (Only applicable to landfill disposal facilities) **Weight which is reused or recycled in accordance with facility permit:** Enter the weight, **in tons,** of waste accepted at the facility which was productively reused at the facility in accordance with the facility's permit OR was recovered and sold in accordance with the facility's permit.

Column 3: (Only applicable to landfill disposal facilities) **Weight accepted from a DEQ approved emergency or special event:** Enter the weight, **in tons,** of waste accepted at the facility from an emergency or special event for which the facility received prior approval from the DEQ to waive the state disposal fee.

Column 4: (Only applicable to landfill disposal facilities) **Weight accepted from large industrial waste generators with DEQ exemption certificate:** Enter the weight, **in tons**, of waste received from large industrial waste generators **which was accompanied by a large industrial waste generator fee exemption certificate issued by the DEQ.**

Column 5: (Only applicable to landfill disposal facilities) **Time scales placed out-of-service:** Enter the approximate time (hour:minute) the scales became inoperative.

Column 6: (Only applicable to landfill disposal facilities) **Time scales placed into service:** Enter the approximate time (hour:minute) the scales were placed into service.

Note: Section 2-10-802 of the Oklahoma Solid Waste Management Act requires operators of certain landfill disposal facilities to weigh all solid waste received at the landfill. ***Only when the scales are inoperative may a landfill record the volume of waste received****.*

Column 7: **Total volume accepted:** Enter the total volume **in cubic yards** of all waste accepted at the facility. The total must include volumes to be reported in columns 8, 9, and 10.

Column 8: (Only applicable to landfill disposal facilities) **Volume which is reused or recycled in accordance with facility permit:** Enter the volume, **in cubic yards,** of waste accepted at the facility which was productively reused at the facility in accordance with the facility's permit OR was recovered and sold in accordance with the facility's permit.

Column 9: (Only applicable to landfill disposal facilities) **Volume accepted from a DEQ approved emergency or special event:** Enter the volume, **in cubic yards,** of waste accepted at the facility from an emergency or special event for which the facility received prior approval from the DEQ to waive the state disposal fee.

Column 10: (Only applicable to landfill disposal facilities) **Volume accepted from large industrial waste generators with DEQ exemption certificate:** Enter the volume, **in cubic yards**, of waste received from large industrial waste generators **which was accompanied by a large industrial waste generator fee exemption certificate issued by the DEQ.**

3. At the end of the month, calculate the total down time for the scales (hours:minutes) and include in the space provided. Sum each column and include in the appropriate column.

QUARTERLY RETURN FOR SOLID WASTE LANDFILLS

Due no later than 30 days after the end of each calendar quarter

Permit Number	Quarter	Year	DEQ Invoice Number

Facilty Name: _____

Mailing Address: _____

_____

_____

1.	Number of operating days this quarter (see instructions)		days
2.	Total weight, in tons, of waste received during this quarter		tons
2a.	Weight received, in tons, which was productively reused or recovered and sold (see instructions)		tons
2b.	Weight received, in tons, from a DEQ approved emergency or special event (see instructions)		tons
2c.	Weight received, in tons, from large industrial waste generators under the large industrial waste generator exemption (see instructions)		tons
3.	Weight subject to state disposal fees (line 2 minus sum of lines 2a, 2b, and 2c)		tons
4.	Total volume, in cubic yards, of waste received during this quarter		yd3
4a.	Weight received, in cubic yards, which was productively reused or recovered and sold (see instructions)		yd3
4b.	Weight received, in cubic yards, from a DEQ approved emergency or special event (see instructions)		yd3
4c.	Weight received, in cubic yards, from large industrial waste generators under the large industrial waste generator exemption (see instructions)		yd3
5.	Volume subject to state disposal fee (line 4 minus sum of lines 4a, 4b, and 4c)		yd3
6.	Volume weight subject to state disposal fee (multiply line 5 by 0.33)		tons
7.	Determine volume weight from total volume (multiply line 4 by 0.33)		tons
8.	Total weight received (add line 2 and line 7)		tons
9.	Average weight received per operating day (divide line 8 by line 1)		tons/day
10.	Weight received subject to state disposal fee (add line 3 and line 6)		tons
10a.	Line 13 from previous quarter		
11.	Enter state disposal fee (If line 10a < $40,000, line 10 x $1.50, otherwise, line 10 x $1.25)		
12.	Enter capital investment waiver (see instructions)		
13.	Determine total capital investment waiver to date (see instructions)		
14.	Enter handling waiver (see instructions)		
15.	Enter total allowable waivers (add line 12 and line 14)		
16.	Penalties (see instructions)		
17.	**TOTAL STATE DISPOSAL FEE DUE** (line 11 plus line 16 minus line 15)		

Typed/Printed Name of Authorized Agent: _____ Date: _____

Signature of Authorized agent: _____ Phone No.: _____

Email Address: _____

Remit report with payment to:

Oklahoma Department of Environmental Quality
Administrative Service - Accounts Receivable
P.O. Box 2036
Oklahoma City, OK 73101-2036

Remit copy of report to:

Oklahoma Department of Environmental Quality
Land Protection Division
P.O. Box 1677
Oklahoma City, OK 73101-1677

Electronic submissions should be submitted to: solidwastereports@deq.ok.gov bernice.green@deq.ok.gov

INSTRUCTIONS FOR COMPLETING THE QUARTERLY RETURN FOR SOLID WASTE LANDFILLS

GENERAL INSTRUCTIONS

All solid waste landfills, except generator owned and operated non-hazardous industrial waste monofills, are required by 27A O.S. §2-10-802 to collect fees on solid waste received at the landfill.

This return should be completed and returned to the Financial and Human Resources Division of the Department of Environmental Quality no later than 30 days after the end of each calendar quarter. Calendar quarters are: 1st quarter--January 1 through March 31, 2nd quarter--April 1 through June 30, 3rd quarter--July 1 through September 30, 4th quarter--October 1 through December 31.

If the return and fees cannot be submitted within 30 days of the end of the quarter, an extension for up to 30 days may be granted by the Department. A request for an extension must be submitted no later than the due date of the return and must include a detailed description of why the extension is needed. The Department will notify you if the extension is granted or not. Please note that extensions cannot be granted which will result in a due date of more than 60 days after the end of the quarter.

SPECIFIC LINE INSTRUCTIONS

Line 1: Enter the number of days during the quarter the landfill was open to receive waste.

Line 2a & 4a: The activities must be included in, and conducted in accordance with, the landfill's permit. Records pertaining to this fee exemption must be included with the quarterly return. Exemption documentation is to include: 1) waste types and 2) weight/volume recycled and method of recycling for each waste type. **If this information is not included, the claim may be disallowed.**

Line 2b & 4b: A copy of the DEQ's written approval waiving the fee must be included with the quarterly return. **If a copy is not included, the claim may be disallowed.**

Line 2c & 4c: Enter the amount of waste received from large industrial waste generators **which was accompanied by a large industrial waste generator fee exemption certificate issued by the DEQ.**

Line 12: If line 13 of last quarter's return is $40,000, enter $0.00, otherwise:
If line 9 is less than 100 tons/day, multiply line 8 by $0.50.
If line 9 is equal to or more than 100 tons/day, multiply line 8 by $0.25.

NOTE: Records documenting the capital investment and the use of the funds must be included with the quarterly return.

Line 13: If line 13 of last quarter's return is less than $40,000, add line 13 of last quarter's return and line 12 of this quarter's return.
If line 13 of last quarter's return is $40,000, enter $40,000.00.

Line 14: If line 13 of last quarter's return is less than $40,000.00, enter $0.00.
If line 13 of last quarter's return is $40,000 AND this return in filed on time, multiply line 11 by 0.10. Otherwise, enter $0.00.

PENALTIES

There is a 5% penalty for returns postmarked more than 30 days after the due date (or filed after the extension date). Your penalty is determined by multiplying line 11 of the return by 0.05 and including this figure on line 16.

There is a 15% penalty per month for returns postmarked more than 60 days after the due date of the return. Your penalty is determined by multiplying line 11 of the return by 0.15, then by the number of months which have elapsed after the due date (or the extension date if applicable) and including this figure on line 16.

If you have any questions, please contact Amber Edwards, Land Protection Division Solid Waste Unit (405) 702-5133.

Appendix B

ODEQ Guidance on Recordkeeping and Reporting

DEQ Guidance on Recordkeeping and Reporting

Regulatory Reference: OAC 252:515-19-40

Applicability. All solid waste disposal facilities.

Purpose. To provide guidance on the records to be maintained in the facility operating record and submitted to the DEQ.

Technical Discussion. All solid waste disposal facilities are required to maintain an operating record containing all records concerning the planning, construction, operation, closing and, if applicable, post-closure monitoring of the facility.[1] Preferably, the operating record should be maintained at the disposal facility; however, an off-site location near the facility which is under the direct control of the owner/operator and accessible during DEQ inspections can be used. For the purposes of this rule, facility records maintained by consultants cannot be considered part of the operating record.

Various Subchapters of OAC 252:515 identify records that must be maintained and/or submitted to the DEQ. This guidance will identify those records so that owner/operators can ensure all required records are being maintained and submitted in a timely manner.

Subchapters 3 through 31 - Permit Applications and Related Documents

- All applications for new and modified permits must be submitted to the DEQ and maintained in the operating record. The permit application includes all text related to the application as well as all maps, drawings, construction plans, QA/QC reports, legal access documents, public notices, etc. required by other Subchapters.
- All correspondence to/from the DEQ related to the permit application must be maintained in the operating record.
- A copy of the approved permit and all associated modifications must be maintained in the operating record.

Subchapter 9 - Groundwater Monitoring and Corrective Action

- Within 60 days of groundwater sampling, a copy of groundwater monitoring results and associated statistical analysis (or cumulative analysis data for C/D landfills) must be placed in the operating record and submitted to the DEQ.
- Within 14 days of determining there is a statistically significant increase (SSI) in one or more monitoring constituents, the DEQ must be notified of the SSI in writing and a copy of the notice placed in the operating record.
- Within 90 days of determining there is a statistically significant increase, either an assessment monitoring program, or a demonstration that the increase was not caused by the facility, must be submitted to the DEQ and placed in the operating record.

[1] This includes all correspondence to/from the DEQ.

- Within 14 days of receiving the results from an assessment monitoring event, the DEQ must be notified of the constituents that were detected.
- Prior to a public meeting to discuss an assessment of corrective measures, the DEQ must be provided with:
  - an affidavit (with a copy of the published notice) showing that public notice of the meeting was published in a local newspaper;
  - copies of certified mail receipts showing that the entities identified in OAC 252:515-9-113(b) were notified of the public meeting; and
  - property and mineral ownership maps covering the area within a 2 mile radius of the facility.
- Within 60 days of the public meeting to discuss an assessment of corrective measures, a proposed remedy must be submitted to DEQ for approval and a copy placed in the operating record.
- When the remedy is complete, a certification signed by the owner/operator and a qualified groundwater scientist must be submitted to the DEQ for approval and the approved certification placed in the operating record.

Subchapter 13 - Leachate Collection and Management

- Documentation must be submitted to the DEQ and maintained in the operating record showing any underground storage tanks used to store leachate meet the requirements of the Oklahoma Corporation Commission at OAC 165:25, Subchapter 1, Part 8.
- Plans for leachate recirculation and/or irrigation must be submitted to the DEQ and maintained in the operating record, as well as all correspondence to/from DEQ related to those plans.
- Any testing results required by leachate recirculation/irrigation plans must be submitted to DEQ and maintained in the operating record.
- If leachate is discharged to a POTW, a copy of a letter from the POTW stating it will accept the leachate must be placed in the operating record and submitted to the DEQ.
- The results of any testing required by the POTW must be maintained in the operating record.
- If leachate is discharged under an OPDES permit, a copy of the permit must be maintained in the operating record.
- Any testing required by the OPDES permit must be submitted to DEQ and maintained in the operating record.

NOTE: Quarterly leachate reports are no longer required to be maintained or submitted.

Subchapter 15 - Methane Gas Monitoring and Control

- Within 30 days of monitoring, gas-monitoring results should be submitted to the DEQ and placed in the operating record.[2]

[2] While the rules don't give a specific time to submit the gas monitoring results, the rules require a remediation plan to be submitted within 30 days of detecting an exceedance. Therefore, it would make sense that the gas monitoring results would be submitted at the same time.

- Within 7 days of detection of an exceedance, submit a written notice to the DEQ of the exceedance and the steps taken to protect human health. A copy of this notice must also be placed in the operating record.
- Within 30 days of detection of an exceedance, a remediation plan must be submitted to the DEQ and a copy placed in the operating record.
- Written notification must be provided to the DEQ when the remediation plan is implemented, and a copy of that notice placed in the operating record.

Subchapter 17 - Stormwater Management

- A copy of the Stormwater Pollution Prevention Plan and OPDES Sector L permit must be maintained in the operating record.
- A copy of the OPDES stormwater permit for construction sites must be maintained in the operating record for any on- or off-site soil borrow areas of 5 acres or more in size.
- OPDES Sector L visual monitoring and Numeric Effluent Limitation Monitoring results must be maintained in the operating record.
- The Annual Comprehensive Site Compliance Evaluation Report must be submitted to the DEQ's WQD no later than December 1st of each year.
- All NELM monitoring results must be submitted to the DEQ no later than October 29th of each year for the period October 2nd of the previous year to October 1st of the current year.

Subchapter 19 - Operational Requirements

- Copies of random waste screening inspections must be maintained in the operating record.[3]
- Monthly waste receipt reports must be submitted to the DEQ and a copy placed in the operating record no later than the 15th of the month following the reporting month.[4]
- To avoid penalties, quarterly returns and fees for landfills must be submitted to the DEQ within 30 days of the end of the quarter.[5] A copy of the quarterly return must be maintained in the operating record.
- Copies of approved out-of-state waste disposal plans must be on file with the DEQ and maintained in the operating record, as well as all correspondence to/from DEQ related to the development of the approved plan.
- The DEQ must be notified at least 5 working days in advance of any proposed changes to an approved out-of-state waste disposal plan.
- Copies of initial design capacity reports required by the New Source Performance Standards (NSPS), as well as required updates to the design capacity, must be submitted to the DEQ and placed in the operating record.
- Copies of all test results required by NSPS must be submitted to DEQ and maintained in the operating record.

[3] An example of a waste screening checklist is included with this guidance.
[4] Monthly reports are not required to be submitted to the DEQ for large NHIW generator landfills, generator owned and operated NHIW monofills, transfer stations, and processing facilities (including incinerators and regulated medical waste facilities). However, records identifying the amount of waste received must be maintained in the operating record and made available to DEQ upon request.
[5] Returns and fees submitted later than this are subject to penalties and are not eligible for the handling waiver.

- Landfills accepting asbestos must maintain the records identified in the Management of Friable Asbestos guidance document.
- Composting facilities must maintain records documenting when windrows were turned, windrow temperatures, and the amount of waste received, processed, and distributed.

Subchapter 21 - Waste Tire Processing, Certification, Permits, and Compensation

Waste tire facilities

- Records of gross and tare weights of each vehicle must be maintained in the operating record.
- A daily log for each load of tires received must be maintained in the operating record. The daily log must include the name and address of the hauler, the number of tires from each tire source, the name and address of each tire source, the number of tires processed each day, and the use and destination of each daily outbound load of processed tire material.
- No later than the 10th of each month, a monthly report must be submitted to the DEQ identifying the following for the previous month: the number of tires received, the number of tires from community-wide clean up events, the number of tires from PCL dumps, a summary of destinations and intended uses of processed tire material, the number of tons of processed tire material provided for each market category, and the number of tires provided to waste tire incinerators that were not useable by the incinerator. The monthly report must also be maintained in the operating record.
- No later than the 10th of the month following the end of each calendar quarter, a quarterly report must be submitted to the DEQ identifying the following for the previous quarter: statewide collection efforts and documentation the scales were certified in accordance with Department of Agriculture requirements. The quarterly report must also be maintained in the operating record.
- All copies of waste tire manifests must be maintained in the operating record.
- All records required by the Oklahoma Tax Commission for reimbursement purposes must be maintained in the operating record.

Entities installing river bank stabilization or other conservation projects[6]

- A copy of the permit or other authorization for the project must be maintained.
- A copy of the project completion report must be submitted to the DEQ and retained by the installer.
- Copies of any letters to/from the DEQ related to the project must be retained by the installer.

Waste tire baling entities[7]

- A copy of a waste tire baling plan must be submitted to the DEQ and maintained in the operating record.
- A copy of the project completion report must be submitted to the DEQ and retained by the entity.
- Copies of any letters to/from the DEQ related to the plan must be maintained in the operating record.

[6] Records must be maintained by the entity for at least 3 years after completion of the project.
[7] Records must be maintained by the entity for at least 3 years after completion of the project.

Subchapter 23 - Regulated Medical Waste Facilities

- A copy of the approved certificate of need must be in the operating record.
- Copies of emergency response agreements must be maintained in the operating record.
- The operating record must include records of when waste was placed into and removed from storage.
- Records of any tests done on a regulated medical waste incinerator must be maintained in the operating record.
- Incinerator monitoring data must be maintained for at least 2 years. Such data includes waste feed rates, fuel and combustion gas flows, oxygen and carbon monoxide, and temperature.
- Testing and disposal records for incinerator ash must be maintained in the operating record.
- For regulated medical waste incinerators, an NHIW notification/certification form and associated documentation showing the ash is non-hazardous must be submitted to the DEQ.

Subchapter 25 - Closure and Post-Closure Care

- Copies of closure and post-closure plans, all amendments, maps, drawings, construction plans, QA/QC reports, legal access documents, etc. required by the plans must be submitted to the DEQ and maintained in the operating record. All correspondence to/from the DEQ related to the permit application must also be maintained in the operating record.
- Documentation of all activities performed for closure must be submitted to the DEQ with the final closure report and placed in the operating record.
- A copy of the land records notice as recorded must be submitted to the DEQ at the conclusion of closure activities.
- All correspondence to/from the DEQ related to closure and/or post-closure activities must be maintained in the operating record.
- No later than April 1st of each year, a post-closure maintenance and monitoring report must be submitted to the DEQ, and a copy placed in the operating record.
- At the conclusion of post-closure, a Certification of Post-closure Performance must be submitted to the DEQ.

Subchapter 27 - Cost Estimates and Financial Assurance

- Copies of all cost estimates and financial assurance documents must be submitted to the DEQ and maintained in the operating record. This includes all correspondence to/from DEQ related to these documents.
- When a surety bond, letter of credit, certificate of deposit, or insurance[8] is used as the financial assurance mechanism, an original and one copy of the instrument must be submitted to the DEQ.
- No later than April 1st of each year, life of site calculations must be submitted to the DEQ, identifying the life of the site as of December 31st of the previous year. The calculations must also be placed in the operating record. This includes all correspondence to/from DEQ related to this calculation.

[8] The actual policy, not a certificate, must be submitted to DEQ.

- No later than April 1st of each year, cost estimates must be recalculated or adjusted for inflation, and the new figures submitted to the DEQ. The calculations must also be placed in the operating record. This includes all correspondence to/from DEQ related to this calculation.
- For all financial assurance mechanisms except the corporate test/guarantee and local government test/guarantee, no later than April 9th of each year, documentation must be submitted to the DEQ to demonstrate financial assurance mechanisms were updated and/or payments made based on the revised cost estimates. The documentation must also be placed in the operating record.
- If the corporate test/guarantee is used as a financial assurance mechanism, no later than 90 days after the end of the corporate fiscal year, the records identified in OAC 252:515-27-81(c) must be submitted to the DEQ and placed in the operating record.
- If the local government test/guarantee is used as a financial assurance mechanism, no later than 180 days after the end of the local government fiscal year, the records identified in OAC 252:515-27-82(h) must be submitted to the DEQ and placed in the operating record.

Subchapter 29 - Exclusion of Prohibited Wastes

- A copy of the Waste Exclusion Plan must be maintained in the operating record and submitted to the DEQ. This includes all correspondence to/from the DEQ related to the plan.
- Copies of all random inspections must be maintained in the operating record. Such records must include the date and time of the inspection, the name of the person conducting the inspection, and the results of the inspection.[9]
- No later than the next working day, the DEQ must be notified of any rejected loads.[10] The notification must include: (1) the date of rejection; (2) the name, address, and phone number of the waste generator; (3) the name of the driver; (4) transporter tag number and (5) transporter name, address, contact name, and phone number. This information must also be maintained in the operating record.
- When necessary, documentation to verify proper disposal of rejected wastes must be maintained in the operating record.
- Copies of personnel training must be maintained in the operating record.[11]

Subchapter 31 - NHIW Management

- Generators disposing of more than 10 cubic yards of NHIW per calendar month off site in an Oklahoma landfill must submit an NHIW Notification/Certification to the DEQ for each NHIW to be disposed.
- No later than the last day of the month, commercial landfills accepting NHIW must submit a report to the DEQ itemizing the type, quantity, and source of NHIW received from persons disposing of more than 10 cubic yards of NHIW the previous month. This report must also be maintained in the operating record.

[9] Attachment 1 is an example of a random inspection sheet that will meet the requirements of the rule.
[10] Telephone notification will suffice.
[11] This includes the training dates, curriculum, and attendees.

XYZ LANDFILL
RANDOM WEP INSPECTION CHECKLIST [EXAMPLE]

Use checklist for all suspicious loads and for 5% of all incoming loads of solid waste.

Date: _____ **Time:** _____ **am/pm**

Customer Name: _____

Vehicle License Plate # and State:_____

Type of Waste (check all that apply):

- ☐ **Household**
- ☐ **Commercial**
- ☐ **Construction / Demolition**
- ☐ **Industrial**
- ☐ **Other** _____

Identify All Unauthorized Wastes Present

- ☐ **Hazardous (corrosive, ignitable, reactive, TCLP toxic, or listed hazardous waste)**
- ☐ **Radioactive**
- ☐ **Untreated Regulated Medical**
- ☐ **PCB**
- ☐ **Automobile Batteries**
- ☐ **Unauthorized Liquid**
- ☐ **Non-conforming NHIW**
- ☐ **Other** _____

Waste accepted?

- ☐ **Yes**
- ☐ **No**

If no, what was done with the waste?

Additional Comments

_____ **Inspector's Name (Print)**

_____ **Driver's Name (Print)**

_____ **Inspector's Signature**

_____ **Driver's Signature**

Notification of unauthorized waste:

- ☐ **DEQ Land Protection Division (405.702.5100)**
  Name / Date
- ☐ **Waste Hauler**
  Name / Date
- ☐ **Waste Generator**
  Name / Date

Appendix C

Paint Filter Liquids Test Procedure

METHOD 9095B

PAINT FILTER LIQUIDS TEST

1.0 SCOPE AND APPLICATION

1.1 This method is used to determine the presence of free liquids in a representative sample of waste.

1.2 The method is used to determine compliance with 40 CFR 264.314 and 265.314.

2.0 SUMMARY OF METHOD

2.1 A predetermined amount of material is placed in a paint filter. If any portion of the material passes through and drops from the filter within the 5-min test period, the material is deemed to contain free liquids.

3.0 INTERFERENCES

3.1 Filter media were observed to separate from the filter cone on exposure to alkaline materials. This development causes no problem if the sample is not disturbed.

3.2 Temperature can affect the test results if the test is performed below the freezing point of any liquid in the sample. Tests must be performed above the freezing point and can, but are not required to, exceed room temperature of 25 ^{o}C.

4.0 APPARATUS AND MATERIALS

4.1 Conical paint filter -- Mesh number 60 +/- 5% (fine meshed size). Available at local paint stores such as Sherwin-Williams and Glidden.

4.2 Glass funnel -- If the paint filter, with the waste, cannot sustain its weight on the ring stand, then a fluted glass funnel or glass funnel with a mouth large enough to allow at least 1 in. of the filter mesh to protrude should be used to support the filter. The funnel should be fluted or have a large open mouth in order to support the paint filter yet not interfere with the movement, to the graduated cylinder, of the liquid that passes through the filter mesh.

4.3 Ring stand and ring, or tripod.

4.4 Graduated cylinder or beaker -- 100-mL.

5.0 REAGENTS

5.1 None.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

A 100-mL or 100-g representative sample is required for the test. If it is not possible to obtain a sample of 100 mL or 100 g that is sufficiently representative of the waste, the analyst may use larger size samples in multiples of 100 mL or 100 g, i.e., 200, 300, 400 mL or g. However, when larger samples are used, analysts shall divide the sample into 100-mL or 100-g portions and test each portion separately. If any portion contains free liquids, the entire sample is considered to have free liquids. If the sample is measured volumetrically, then it should lack major air spaces or voids.

7.0 PROCEDURE

7.1 Assemble test apparatus as shown in Figure 1.

7.2 Place sample in the filter. A funnel may be used to provide support for the paint filter. If the sample is of such light bulk density that it overflows the filter, then the sides of the filter can be extended upward by taping filter paper to the inside of the filter and above the mesh. Settling the sample into the paint filter may be facilitated by lightly tapping the side of the filter as it is being filled.

7.3 In order to assure uniformity and standardization of the test, material such as sorbent pads or pillows which do not conform to the shape of the paint filter should be cut into small pieces and poured into the filter. Sample size reduction may be accomplished by cutting the sorbent material with scissors, shears, a knife, or other such device so as to preserve as much of the original integrity of the sorbent fabric as possible. Sorbents enclosed in a fabric should be mixed with the resultant fabric pieces. The particles to be tested should be reduced smaller than 1 cm (i.e., should be capable of passing through a 9.5 mm (0.375 inch) standard sieve). Grinding sorbent materials should be avoided as this may destroy the integrity of the sorbent and produce many "fine particles" which would normally not be present.

7.4 For brittle materials larger than 1 cm that do not conform to the filter, light crushing to reduce oversize particles is acceptable if it is not practical to cut the material. Materials such as clay, silica gel, and some polymers may fall into this category.

7.5 Allow sample to drain for 5 min into the graduated cylinder.

7.6 If any portion of the test material collects in the graduated cylinder in the 5-min period, then the material is deemed to contain free liquids for purposes of 40 CFR 264.314 and 265.314.

8.0 QUALITY CONTROL

8.1 Duplicate samples should be analyzed on a routine basis.

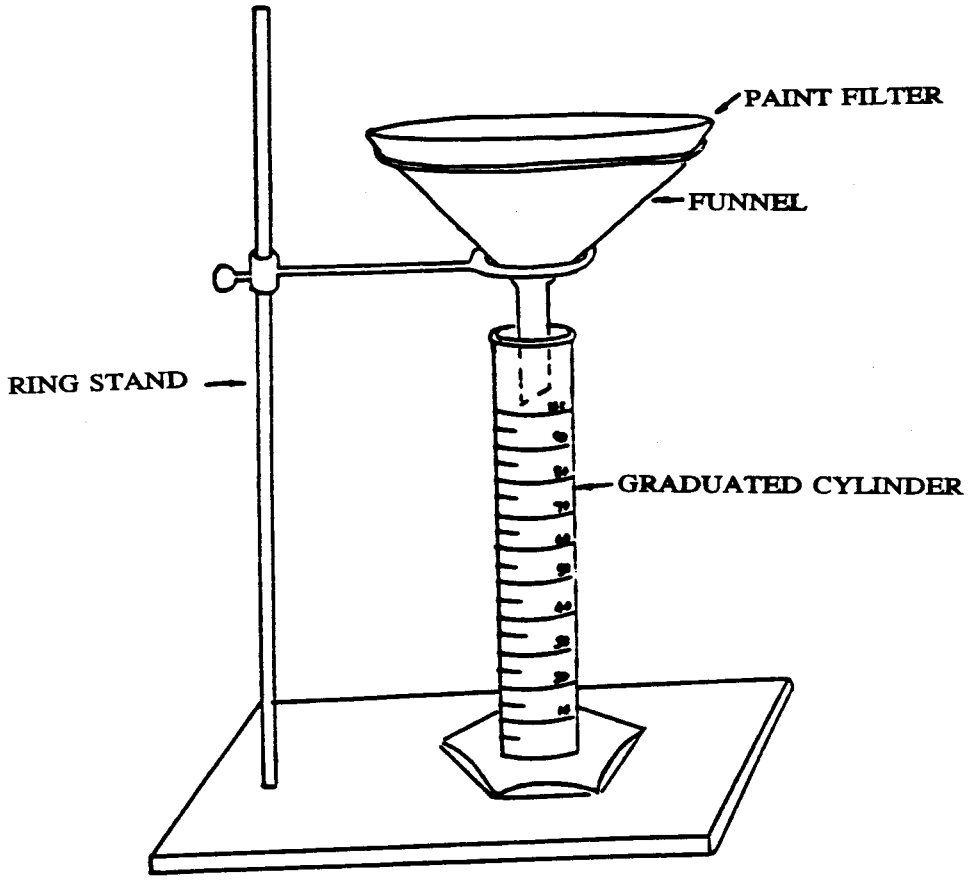
9.0 METHOD PERFORMANCE

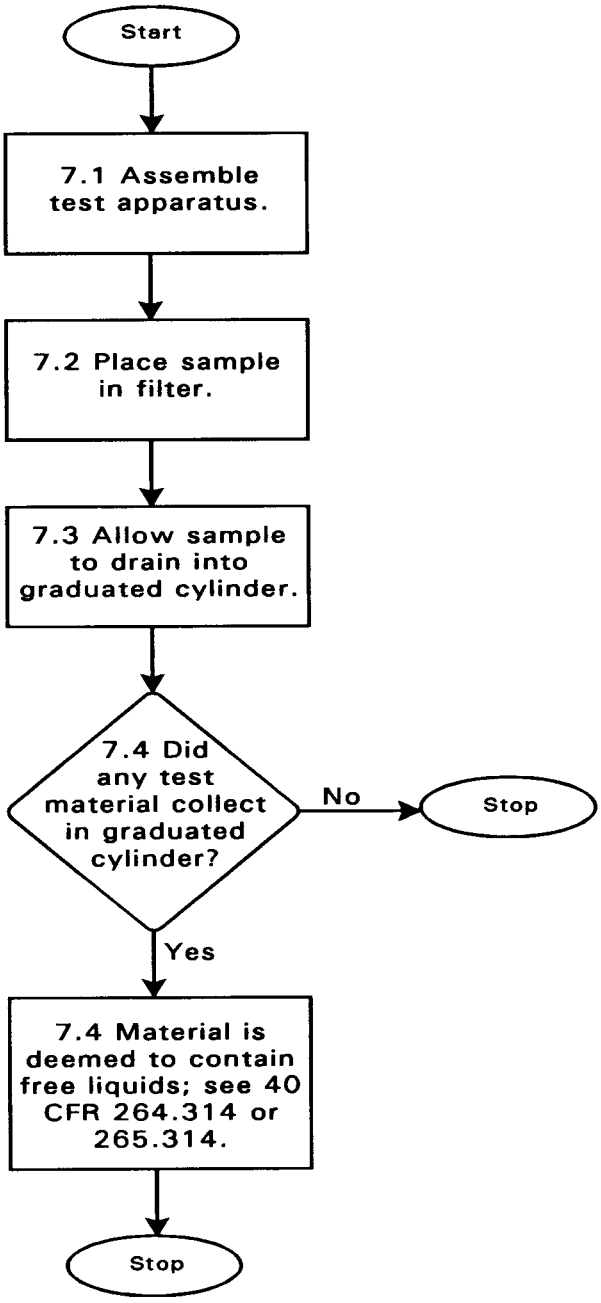
9.1 No data provided.

10.0 REFERENCES

10.1 None provided.

FIGURE 1
PAINT FILTER TEST APPARATUS




Start
7.1 Assemble test apparatus.
7.2 Place sample in filter.
7.3 Allow sample to drain into graduated cylinder.
7.4 Did any test material collect in graduated cylinder?
No
Stop
Yes
7.4 Material is deemed to contain free liquids; see 40 CFR 264.314 or 265.314.
Stop

Appendix D

AEL Salvage and Recycling Plan

Salvage and Recycling Plan
American Environmental Landfill

American Environmental Landfill, Inc.
207 North 177th West Avenue
Sand Springs, Oklahoma 74063

SCS ENGINEERS

27220345.00 | May 2024
Revised February 2025

8575 W. 110th Street, Suite 100
Overland Park, KS 66210
913-681-0030

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2.3 SALVAGE AND RECYCLING DOCUMENTATION 3

Attachments

Attachment A Salvage and Recycling Area
Attachment B Tire Fire and Mosquito Prevention Tips

1.0 INTRODUCTION

In accordance with OAC 252:515-19-39, the American Environmental Landfill (AEL) proposes the following Salvage and Recycling Plan detailing operations for conducting salvage and recycling activities at the permitted facility. A site location map depicting the salvage and recycling operation areas and the permitted areas of the landfill is included in Attachment A. Salvage and recycling activities will be conducted in an area away from the working face. The recycling area will be open for operation during normal operating hours of the landfill disposal facility. Traffic will follow patterns identified at the facility.

2.0 SALVAGE AND RECYCLING WORK PLAN

The following work plan details methods of collection and transportation of recyclable materials both to and from the disposal site. Recyclable materials will be collected by and transported to the disposal site by users of the facility. Upon arriving at the site, recyclable material will be weighed at the facility scale house and directed to the salvage and recycling area.

If material is identified at the working face of the landfill, as suitable and practicable for salvage and recycling activities, the recyclable materials will be removed by facility staff and taken to the salvage and recycling area. When the AEL has collected enough material for the market and there appears to be a financial benefit, the recyclable material will be weighed and transported to the appropriate vendor(s).

2.1 SALVAGEABLE AND RECYCLABLE MATERIAL

This salvage and recycling plan includes, but is not limited, to the following materials:

- Miscellaneous metal products, e.g., refrigerators, stoves, dryers, sheet metal, etc.
- Freon removed from the above recycled miscellaneous metal products, e.g., refrigerators, etc.
- Tires
- Wooden cross-ties
- Wood, e.g., tree limbs, stumps, branches, brush, lumber, pallets
- Uncontaminated rock, dirt, concrete, bricks, and solidified asphalt
- Other materials found appropriate to recycle and/or beneficial reuse

These materials will be sorted and stored in separate piles and will be spaced adequately to allow for a fire lane and allow for vehicle access. When storing tires, the facility should adhere to the Tire Fire and Mosquito Prevention Tips included in Attachment B. The storage of any putrescible wastes at the salvage and recycling area is not expected. The operation of this salvage and recycling area should not significantly add to the population of insects or animals not already present at the disposal facility. These recyclable materials are innocuous and will not negatively impact the environment. Freon removal from recycled metal products will be conducted by an AEL employee or third party licensed to remove Freon.

This plan allows for chipping, shredding, or grinding wood material to produce a product for beneficial reuse at the facility. Excessive wood material will be processed when sufficient volumes exist to constituent economic feasibility. Uncontaminated rock, concrete, bricks, and solidified asphalt found suitable for beneficial reuse by the facility may be used as erosion and run-on/off controls, for site improvements, etc. Uncontaminated soil suitable for reuse may be used as daily or intermediate cover if the laboratory reports received during the waste approval process indicate no analytical parameters above laboratory detection limits. Per OAC 252:515-19-51(d), uncontaminated soil used as daily cover is capable of controlling disease vectors, fires, odors and blowing litter without presenting a threat to human health or the environment. Per OAC 252:515-19-52(d),

uncontaminated soil used as intermediate cover is capable of minimizing infiltration of water and sustaining vegetation while being free of garbage, trash, or other unsuitable material.

2.2 COLLECTED MATERIALS MANAGEMENT

The collected materials will be transported to the following applicable facilities or suitable equivalents:

- Miscellaneous metal products will be recycled by a metal recycling facility
- Freon will be transported to a refrigerant recycling facility
- Tires will be transported to a tire recycling facility
- Wooden cross-ties will be used by the AEL in the construction of site improvements
- Wood materials will be chipped and used in the construction of site improvements
- Uncontaminated rock, dirt, concrete, bricks, and solidified asphalt will be used by the AEL in the construction of site improvements

The materials collected will be stored according to the following time limits to ensure compliance with the one (1) year accumulation limit. Materials exceeding these storage durations will be classified and regulated as solid waste:

- Miscellaneous metal products: Stored for up to **6 months**
- Freon: Stored for up to **6 months**
- Tires: Stored for up to **3 months**
- Wooden Cross-Ties: Stored **as used**
- Processed wood material: Stored for up to **3 months** or **as used**
- Uncontaminated rock, dirt, concrete, bricks, and solidified asphalt: Stored **as used**

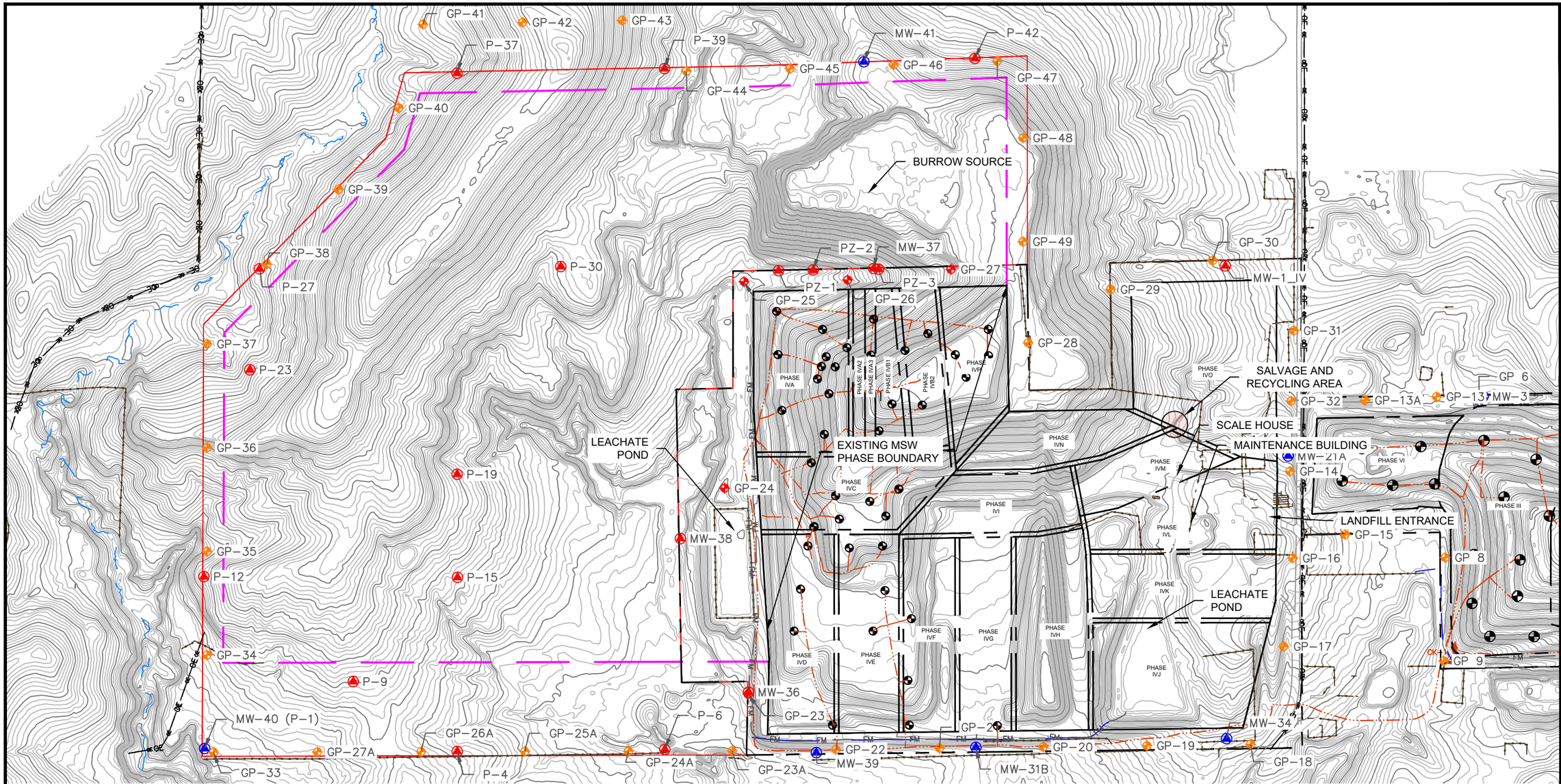
This salvage and recycling plan does not include any processing of waste at locations away from the facility. The landfill will accept source-separated recyclable materials if they pay the appropriate landfill fees. Material recycled by the facility will be weighed prior to transportation offsite or reuse.

2.3 SALVAGE AND RECYCLING DOCUMENTATION

On the monthly report to ODEQ, the AEL will submit the amount of material recycled and the date sent or used. A copy of this Salvage and Recycling Plan will be maintained at the AEL. Additions or changes to this plan will be maintained onsite and available for review upon request from ODEQ.

Attachment A

Salvage and Recycling Area



LEGEND:

- EXISTING 2' MINOR CONTOUR
- 1570 EXISTING 10' MAJOR CONTOUR
- EXISTING FENCE
- OE OE EXISTING OVERHEAD ELECTRIC
- EXISTING UNPAVED ROAD
- EXISTING PAVED ROAD
- EXISTING BODY OF WATER
- SOLID WASTE PHASE BOUNDARY
- SOLID WASTE PERMIT BOUNDARY
- ELECTRICAL CONDUIT
- FM FM LEACHATE FORCEMAIN
- LANDFILL GAS COLLECTION SYSTEM PIPING
- EXTRACTION WELL
- GAS PROBE
- MONITORING WELL
- MONITORING WELL ABANDOMENT
- GAS PROBE ABANDONMENT
- PROPOSED EXPANSION AREA PERMIT BOUNDARY
- PROPOSED LIMITS OF WASTE
- EXISTING STREAM
- SALVAGE AND RECYCLING AREA

NOTES:

1. AERIAL TOPOGRAPHY PERFORMED BY AERIAL DATA SERVICES, LLC ON JANUARY 27, 2023.
2. PROPOSED GAS PROBES AND MONITORING WELLS ARE DEPICTED WITHIN THE EXPANSION AREA

N

500 0 500 1000

SCALE FEET

REV.	DATE	DESCRIPTION	OK. BY
1			
2			
3			
4			
5			
6			

SHEET TITLE: SALVAGE AND RECYCLING AREA

PROJECT TITLE: AEL SALVAGE AND RECYCLING PLAN

CLIENT: AMERICAN ENVIRONMENTAL LANDFILL, INC.
AMERICAN ENVIRONMENTAL LANDFILL
SAND SPRINGS, OK

SCS ENGINEERS
8575 West 110th Street, Suite 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO. 27220345.00
DSN. BY: TWL
DWN. BY: TWL
CHK. BY: CF
Q/A RVW BY: W.J.M
PROJ. MGR: W.J.M

CADD FILE: SITE LAYOUT FOR SALVAGE AND RECYCLING

DATE: 12/11/23

SCALE: 1"=500'

DRAWING NO. 1 of 1

Attachment B

Tire Fire and Mosquito Prevention Tips

Tire Fire Prevention Tips

Learn how to properly store youre tires to avoid hazards and reduce the risk of starting a fire.

Improper storage of tires can lead to large, uncontrollable fires that emit environmental pollutants such as hazardous gases, heavy metals, and oils. These fires often lead to neighborhood evacuations and contaminate air and waterways.

Do your part to avoid fires and store your tires correctly! Check out the tips below to get started.

Outdoor Storage (In accordance with 3405 IFC)

- Tire storage piles should be separated by a clear space of at least 40 feet.
- Tire piles should be located at least 50 feet from lot lines and buildings.
- Ensure that tire piles do not exceed 10 feet in height.
- Keep tire piles away from combustible ground vegetation such as weeds, grass, brush and forested areas.

Make sure to check local ordinances and codes to ensure you are storing tires appropriately.

Indoor Storage (In accordance with 3409 IFC)

- Always store tires on tread.
- Tire piles should not be more than 50 feet in length.
- Tires stored adjacent to or along one wall should not extend more than 25 feet from that wall.

Refrain from open burning, smoking, and operating cutting, welding, or heating devices in tire storage yards. (3404 IFC)

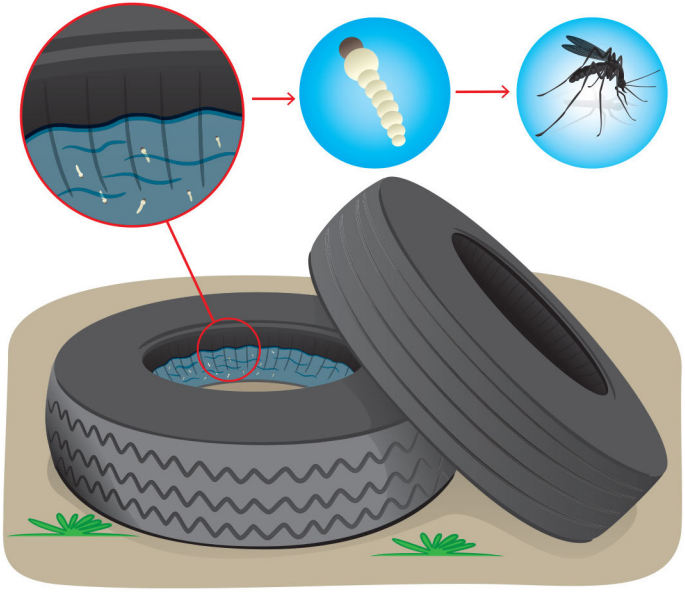
OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

Have questions or want more information on tire storage or mosquitoes? Call the Tire Recycling Program at 405-702-5175.

Oklahoma Department
of Environmental Quality
PO Box 1677
Oklahoma City, OK 73101-1677
Land Protection Division 405-702-5100
Tire Recycling Program 405-702-5175

Mosquito Prevention

Store tires properly to reduce breeding opportunities for mosquitoes that may carry life-threatening diseases.



Tires make for perfect breeding grounds for mosquitoes.

Stagnant water and the collection of leaves offer great conditions for **thousands of mosquitoes to grow in one tire alone.**

Try to store all tires indoors or stack and cover them outdoors.

If this is not possible, attempt to drain water from tires aer rain and use approved pesticides or sprays

Appendix J

Waste Exclusion Plan

October 14, 2024
File No. 27224325.00

Mr. Jeff Biddick
Oklahoma Department of Environmental Quality
Division of Land Protection
707 N. Robinson
P.O. Box 1677
Oklahoma City, OK 73101-1677

Subject: NOD Response – Waste Exclusion Plan
American Environmental Landfill
Permit No. 3557021

Dear Mr. Biddick:

On behalf of our Client, American Environmental Landfill, Inc., SCS Engineers (SCS) is submitting this response to the Notice of Deficiency dated September 3, 2024 from the Oklahoma Department of Environmental Quality (ODEQ) associated with the American Environmental Landfill updated Waste Exclusion Plan dated May 20, 2024. SCS Engineers has addressed the deficiencies noted in the Notice of Deficiency and those responses are shown below.

1. Section 4.1 (Procedures for Random Inspections) of the WEP states that random load inspections will occur at a minimum frequency of one load every two weeks. In accordance with Paragraph 16 of the CO, Section 4.1 of the WEP must be revised by increasing the frequency of random load inspections to a minimum of one load every week.

Response: Section 4.1 has been revised and random inspections will be conducted at a minimum frequency of one load every week.

2. Section 4.3 (Proper Storage and Disposal of Rejected Waste) of the WEP states that hazardous waste may be stored at a municipal solid waste landfill for 90 days provided that the requirements of 40 CFR § 262.34 are met. Please note, the referenced citation at 40 CFR § 262.34 has been removed. If AEL becomes a generator of hazardous waste, AEL must comply with all applicable requirements in 40 CFR Part 262, based on its generator category (very small quantity, small quantity, or large quantity).

Response: Section 4.3 has been revised stating storage and disposal of hazardous waste must comply with all applicable requirements in 40 CFR Part 262, based upon generator category (very small quantity, small quantity, and large quantity) classification. All 40 CFR § 262.34 references have also been removed.

3. In accordance with Paragraph 16 of the CO, Section 5.1 (Curriculum) of the WEP must be revised to include training on how to use AEL's manifest checklist.

Response: Section 5.1 has been revised to include procedures for completing random inspections and how to utilize manifest checklist.

4. In Appendix B (Hazardous Waste Identification Process), page B-3, please clarify the "four categories" of wastes that are excluded from the definition of hazardous waste.

Response: Appendix B has been revised to include the four categories of waste which are excluded from the definition of hazardous waste (household, agricultural, mining overburden, and fossil fuel combustion).

5. The term "conditionally exempt small quantity generators" has been replaced with "very small quantity generators." Please correct all instances of this phrase and correct any citations pointing to the corresponding regulations (40 CFR Part 260).

Response: Appendix B has been revised to remove all conditionally exempt small quantity generators language and 40 CFR Part 260 references and added very small quantity generator language and references.

6. Appendix D includes a previous version of the DEQ non-hazardous industrial waste (NHIW) Certification Form. Please use the most updated version available on DEQ's website, which includes the DEQ email address for form submissions.

Response: Appendix D has been revised to include the DEQ NHIW Certification Form currently available on DEQ's website.

We trust that the attached documents include all necessary information sufficient for your approval. If you have any questions or comments, or need additional information, please do not hesitate to contact the undersigned. Thank you very much for your time and effort in this matter.

Sincerely,

Wade J. Miller
Project Director

Trevar Lytle, P.E.
Senior Project Professional

cc: Mr. Todd Green – American Environmental Landfill

Waste Exclusion Plan
American Environmental Landfill

American Environmental Landfill, Inc.
207 North 117th West Avenue
Sand Springs, Oklahoma 74063

SCS ENGINEERS

27224325.00 | October 2024

1809 Commons Circle, Suite B
Yukon, OK 73099
405-265-3960

INDEX AND CERTIFICATION PAGE

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3.0	Waste Exclusion Procedures	2
4.0	Random Inspections	5
5.0	Personnel Training	2
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CERTIFICATION

This report has been prepared for exclusive use by American Environmental Landfill, Inc. for the American Environmental Landfill (AEL) for specific application to the project discussed, and it has been prepared in accordance with good engineering practices including consideration of industry standards and the requirements of the Oklahoma Department of Environmental Quality.

Prepared by:

Trevar Lytle, P.E.
SCS Engineers

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1.0 INTRODUCTION

This Waste Exclusion Plan (WEP) is intended to assist the operators of American Environmental Landfill, Inc. in conducting sampling and analysis of waste at the American Environmental Landfill (AEL). The AEL is located near Sand Springs, Oklahoma in Sections 35 and 36, Township 20 North, Range 10 East, in Osage County, Oklahoma. The project site is on the Wekiwa Oklahoma 7.5 Minute USGS Quadrangle map. AEL is bordered by the Arkansas River to the South. The AEL operates under the Oklahoma Department of Environmental Quality (ODEQ) Permit Number 3557021.

The objective of the WEP is to outline the acceptance requirements and the review and approval process used to accept non-hazardous industrial solid waste (NHIW). This plan satisfies the requirements set forth in OAC 252:515-29.

1.1 WEP LOCATION

Complete copies of the WEP will be kept at appropriate locations. The primary location shall be in the scale house office which gate attendants, supervisors, managers, and other relevant personnel have access to.

The WEP must be maintained on file in the operating records of the facility and must be available for onsite review by regulatory authorities to demonstrate compliance with the requirements of Subchapter 29 (OAC 252:515-29).

1.2 WEP AMENDMENTS

Any changes that are made to the approved WEP need to be checked and accepted by the Oklahoma Department of Environmental Quality (ODEQ). The new (or modified) WEP that includes all plan amendments must be submitted within 30 days to the ODEQ for approval.

2.0 WASTE ACCEPTANCE GUIDELINES

Under solid waste disposal permit number 3557021, the AEL is permitted to accept and manage solid waste, non-hazardous industrial waste (both liquid and solid), and contaminated soil with no TPH restrictions. AEL also accepts municipal and industrial sludge, both friable and non-friable asbestos, and other non-hazardous industrial waste (NHIW). Municipal sewage sludge treated to Class B requirements, as described in 40 CFR 503.32(b), may be disposed at the AEL if the sludge passes the Paint Filter Liquids Test (PFLT).

All NHIW is profiled and approved prior to shipment. Transport is manifested and disposal is documented and reported to the Oklahoma Department of Environmental Quality (ODEQ).

2.1 ACCEPTABLE WASTES

Below is the definition of the wastes permitted for disposal at the AEL. These definitions should be used during the waste exclusion identification process.

Solid Waste – all putrescible and non-putrescible refuse in solid or semisolid form including, but not limited to, garbage, rubbish, ashes or incinerator residue, street refuse, dead animals, demolition waste, construction wastes, solid or semisolid commercial and industrial wastes.

Household Waste – any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households, which can include single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas.

Commercial Solid Waste – all types of solid waste generated by stores, offices, restaurants, warehouses, and other non-manufacturing activities.

Construction and Demolition Waste – consists of the debris generated during the construction, renovation, and demolition of buildings, roads, and bridges.

Non-Hazardous Industrial Solid Waste (NHIW) – Means any of the following wastes deemed by the ODEQ to require special handling:

- unusable industrial or chemical products
- solid waste generated by the release of an industrial product into the environment
- solid waste generated by a manufacturing or industrial process

The term NHIW shall not include waste that is regulated as hazardous waste or is commonly found as a significant percentage of residential solid waste. Examples of NHIW are listed in Appendix A.

Contaminated Soil – Soils contaminated with concentrations of (TPH) < 1,000 ppm can be disposed in both pre-Subtitle D and Subtitle D areas of the landfill. Soils with TPH > 1,000 ppm are allowed only in Subtitle D areas.

Sludge **(municipal and industrial)** – Any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant. Municipal sewage sludge must be treated to Class B requirements as described in 40 CFR 503.32(b) and pass the PFLT.

Non-Friable Asbestos – any material that contains more than one percent asbestos but cannot be pulverized under hand pressure.

Friable Asbestos – includes any material that contains more than one percent asbestos by weight or area, depending on whether it is a bulk or sheet material and if it can be crumbled, pulverized, or reduced to powder by the pressure of an ordinary human hand. The friable asbestos disposal location, depth, coordinates, and volume must be marked on a map or diagram and placed in the operating record.

Liquid Wastes – Liquid or semi-solid wastes accepted at the facility include, but are not limited to: industrial waste (cooling fluids, cutting oils, rinse water), latex paint, ink, food production waste, municipal waste (tank bottoms, sludges) and drilling waste, among others. Liquid waste is placed into buried containers over a lined area and mixed with bulking material in order to convert the liquid into a solid form that can be accepted for disposal at the landfill.

Special Wastes – Wastes that are non-hazardous wastes, but which, because of their nature or volume, process-generating waste, require special or additional handling aside from that given to routine household refuse. Appendix A presents a list of the wastes that fall under the "special waste" category and it provides the recommended management options for such wastes.

Other – Any NHIW or other wastes that have been deemed by the ODEQ as non-hazardous and can be disposed in an MSWLF.

2.2 PROHIBITED WASTE

Below is the definition of the wastes prohibited for disposal at the AEL. These definitions should be used during the waste exclusion identification process. Please refer to Appendix A and Appendix B for a detailed description, handling procedures, and examples of prohibited wastes.

Hazardous Waste – Includes all the wastes subject to regulation under OAC 252-205. Hazardous wastes may be gases, liquids, solids, or sludges that are listed or exhibit the characteristics described in 40 CFR Part 261. Household hazardous wastes are excluded from Subtitle C regulation; therefore, these wastes may be accepted for disposal at an MSWLF unit. Examples of other classes of solid wastes that are excluded from regulation as hazardous waste under 40 CFR §261.4(b) and may be accepted for disposal at an MSWLF unit can be found in Appendix B. For a comprehensive list of hazardous wastes that shows the exact conditions under which these wastes are excluded from regulation refer to 40 CFR 261.4(b). A detailed hazardous waste identification process is provided in Appendix B.

Radioactive Waste – Waste with radioactivity

Regulated Medical Waste - any waste or reusable material that contains an etiologic agent and is generated in the diagnosis, treatment, or immunization of human beings or animals

Regulated Polychlorinated Biphenyl (PCB) Waste – PCB waste containing PCB concentrations greater than or equal to 50 ppm and may be liquids or non-liquids, sludges, or solids that are defined at 40 CFR Section 761.60. PCB wastes do not include small capacitors found in fluorescent light ballast, white goods, (e.g., washers, dryers, refrigerators), or other consumer electrical products (e.g., radio and television units).

2.3 ANALYTICAL AND SAMPLING REQUIREMENTS

In order to determine whether a material should be considered hazardous or non-hazardous waste, certain analytical tests might be required. The type of analysis is dependent on the waste stream to be disposed. The analyses must always be conducted in accordance with the EPA test procedures outlined in "Test Methods for Evaluation of Solid Wastes, Physical/Chemical Methods" (EPA Publication Number SW-846), "Methods for Chemical Analysis of Water and Wastes" (EPA-600/4-79-020), American Society of Testing and Materials (ASTM) Standard Methods or any other approved EPA method.

Methods used to determine if wastes are hazardous based on the characteristics they exhibit are indicated in Appendix B. A method used to determine the toxicity characteristic of wastes is the Toxicity Characteristic Leaching Procedure (TCLP). The TCLP limits for which a waste can be regulated are shown in Appendix C.

Other testing parameters suggested for various typical wastes include, but are not limited to, pH, flashpoint, reactive cyanide, reactive sulfide, paint filter, total petroleum hydrocarbons, TCLP for metals, TCLP for volatiles, TCLP for semi-volatiles, TCLP for herbicides/pesticides, PCBs, etc. It is the responsibility of the assigned landfill personnel to decide the testing requirements based upon a case-by-case basis.

The analytical data should include information on the reference methods employed for the analysis, and such methods need to be EPA/ODEQ approved. Additionally, Quality Assurance/Quality Control (QA/QC) information should include sampling handling, containerization and preservation techniques, chain of custody records, data on standards, duplicate analysis, spikes and blanks, and other pertinent statistical information.

The analytical methods must be performed using "representative samples" collected through accepted sampling methods as described in SW-846 or other approved references.

3.0 WASTE EXCLUSION PROCEDURES

The acceptance of NHIW at AEL will follow the waste exclusion guidelines and procedures outlined in this section to prevent the disposal of prohibited wastes.

3.1 NOTIFICATION TO GENERATORS AND HAULERS

Generator and hauler inquiries can be directed to the gate attendant, waste coordinator, or other personnel at the facility who have received appropriate training (as specified in Section 5.0). When requested, AEL personnel will supply generators with the necessary forms and any additional analytical requirements prior to acceptance of the NHIW in the facility.

3.2 WASTE EVALUATION AND IDENTIFICATION

OAC 252:515-31 places the burden of NHIW identification on the generators. NHIW intended to be disposed at AEL must be properly identified by the generators as non-hazardous by using appropriate chemical analysis and/or process knowledge. Generators need to submit an NHIW Certification form to the ODEQ, included in Appendix D, which indicates the NHIW is a non-hazardous waste. The ODEQ may require the generator to provide additional documentation in support of the certification.

A copy of the certification form and accompanying supplemental documentation that was submitted to the ODEQ (see Appendix D) needs to be presented to AEL by the generator or hauler prior to disposal of NHIW. Additionally, prior to waste disposal at the landfill, NHIW generators shall also complete the Waste Profile Form included in Appendix D. The Compliance Officer shall complete the Post Review Profile Checklist included in Appendix D for each Waste Profile received.

Each incoming NHIW load must be evaluated to verify whether it is acceptable for disposal at the facility or not. The Waste Profile Form will be reviewed to determine the waste acceptability. The criteria for waste acceptance or rejection will be based on the classification and characteristics of the waste as reported in the Waste Profile Form. Section 2.0 of the WEP provides a description of the wastes that are permitted and prohibited at AEL. A list of examples of acceptable NHIW and special wastes is given in Appendix A. Some categories of hazardous wastes, that can be accepted in an MSWLF because they are excluded from hazardous waste regulations, are shown in Appendix B.

Wastes that are not included in the Appendices can be evaluated using information about the waste as well as the process generating the waste. Examples of such information include, but are not limited to: Material Safety Data Sheets (MSDS), laboratory analysis (e.g. a total metals analysis that can show the metals of concern are not present in the waste), process knowledge, manufacturer's literature, or other means necessary to evaluate and/or analyze the waste and determine its suitability for disposal at the landfill.

When using process knowledge to address one or more NHIW evaluation criteria, the following information shall be documented:

- Waste description, including all waste components and sources
- Description indicating the reason for discarding the material
- Description of changes in the generation process
- Required analysis (if any)

Analytical data review is usually necessary when either of the following occurs:

- A new generator has submitted a request for waste disposal at the landfill
- An existing generator has submitted a request for disposal of a new waste stream
- When an owner/operator becomes aware of a change in the process generating waste

The landfill will periodically re-evaluate approved NHIW waste streams and update waste identification information. The frequency of testing required of the generator will be at the discretion of the owner/operator based on the size and variability of the waste stream, but it will not exceed once every three years.

3.3 WASTE EVALUATION PERSONNEL

Only trained personnel will be responsible for the evaluation and documentation of NHIW loads entering the facility. Examples of trained personnel include:

- General manager
- Foreman
- Scale house attendants
- Compactor operator
- Any other trained personnel approved by the manager

The personnel in charge of waste evaluation and documentation will be trained following the guidelines presented in Section 5.0 and will complete a training refresher course at least once a year.

3.4 GATE ACCEPTANCE PROCEDURES

The gate attendant or scale operator should complete the Gate Attendant Checklist presented in Appendix D for every NHIW load entering the facility. The responsibilities of the gate attendant include, but are not limited to:

- Verify that the Waste Profile Form and any other required state or federal approvals are on file for the generator
- Check the volume of the incoming load
- Check that the information in the manifest agrees with the Waste Profile Form
- Verify that all signatures are in place as required, and the signed manifest is placed in the site operating record

A Manifest Checklist is provided in Appendix D and shall be utilized for every NHIW load entering the facility.

4.0 RANDOM INSPECTIONS

This Section presents the procedures for performing random inspection. Random inspections are conducted by properly trained personnel. Additionally, trained personnel shall be on-site during all hours the facility is open to accept waste.

4.1 PROCEDURES FOR RANDOM INSPECTIONS

Random inspections of waste are conducted at a minimum of 1 load every week. Drivers of vehicles who are randomly selected for inspections are directed to the inspection area by the scale house attendant or site personnel. The load is then inspected by site personnel who have undergone WEP Training. Site personnel will inspect the waste and complete the Random Waste Screening Inspection Form provided in Appendix D.

Inspection priority can be given to haulers with unknown service areas, to loads brought to the facility in vehicles not typically used for disposal of municipal solid waste, and to loads transported by previous would-be offenders. For wastes of an unidentifiable nature received from sources other than households (e.g., industrial or commercial establishments) the inspector should question the transporter about the source/composition of the materials.

Loads should be inspected prior to the actual disposal of the waste at the active face of the landfill unit to provide the facility owner or operator the opportunity to refuse or accept the waste. Visual inspections may also occur near the facility scale house, inside the site entrance, or near to, or adjacent to, the active face of the landfill unit. Inspections of materials may be accomplished by discharging the vehicle load in an area designed to contain potentially hazardous wastes that may arrive at the facility. The waste should be carefully spread for observation using a front-end loader or other piece of equipment.

Personnel should be trained to identify suspicious wastes. Some indications of suspicious wastes are:

- hazardous placards or marking
- liquids
- powders or dusts
- sludges
- bright or unusual colors
- drums or commercial-size containers
- chemical odors

Containers with contents that are not easily identifiable, such as unmarked 55-gallon waste drums, should be opened only by trained personnel. Because these drums could contain hazardous waste, they should be refused whenever possible. Upon verifying that the solid waste is acceptable, it may then be transferred to the active face for disposal.

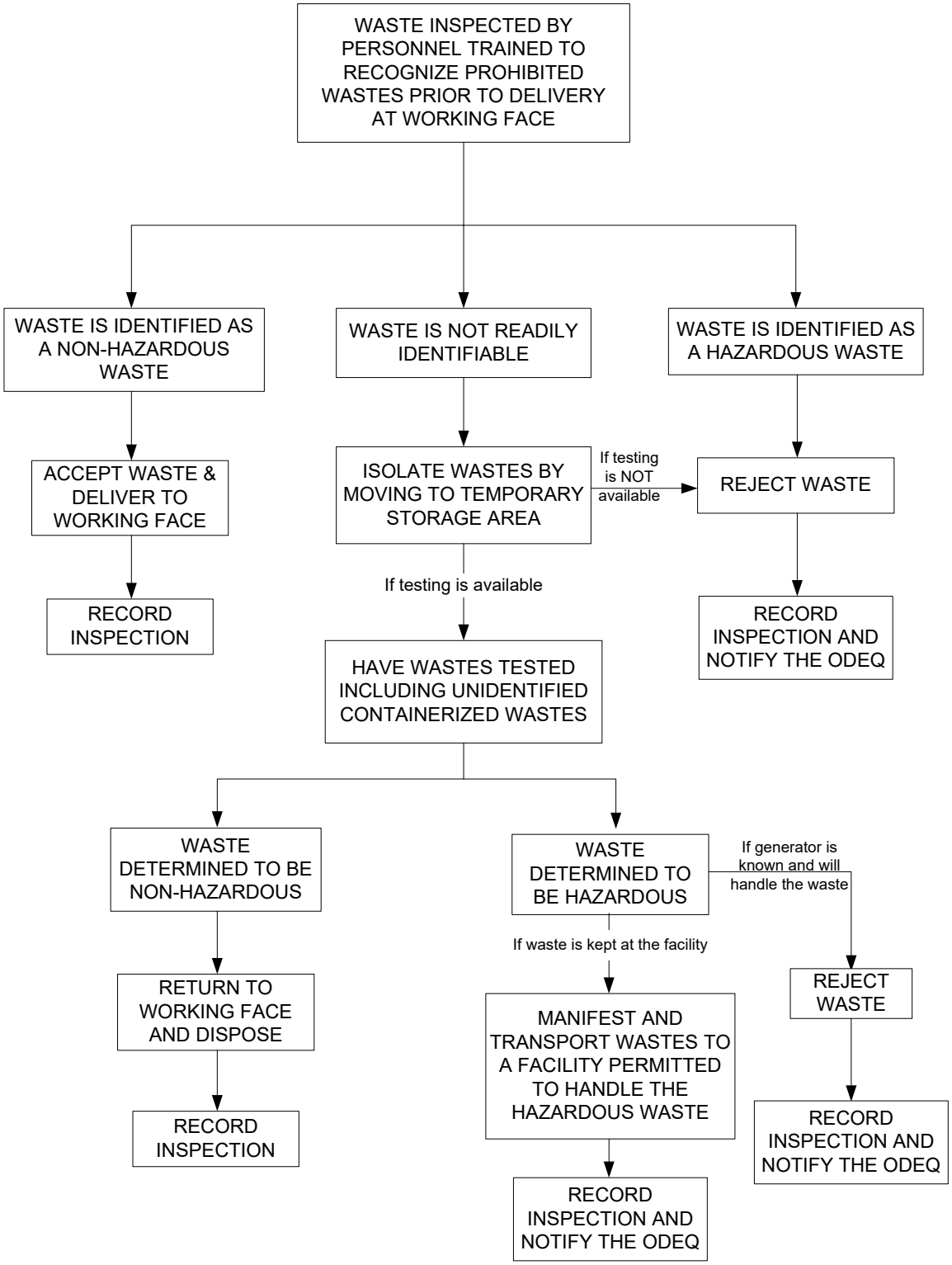
When prohibited wastes are discovered during an inspection, the wastes should be rejected prior to disposal at the active face of the facility. If such wastes are found after disposal in the landfill, they should be properly managed. If wastes temporarily stored at the site are determined to be hazardous, the owner or operator is responsible for the management of the waste. Guidelines for

appropriate management of rejected and prohibited wastes are provided in this section. Whenever prohibited wastes are found and/or rejected, the Waste Rejection Form found in Appendix D must be completed and the waste must be reported to the ODEQ.

If the random inspections indicate unauthorized wastes are being brought to the MSWLF site, then the random inspection program should be modified to increase the frequency of inspections.

An inspection flow chart to identify, accept, or refuse solid waste is provided below:

Prohibited Waste Decision Tree



4.2 INSPECTION RECORDS

All inspections performed shall be documented and recorded in Attachment D. At a minimum, the inspection report shall include:

- Date and time of the inspection
- Person conducting the inspection
- Results of the random inspection

ODEQ shall be notified by the end of the next working day of:

- Any waste identified and rejected prior to receipt as a prohibited waste
- Any load identified and rejected at the gate, during random inspections, or upon disposal at the active face, as a prohibited waste

Notification of rejected waste shall describe the reason for rejection and include:

- Date of rejection
- Name, address, phone number, and contact person of the waste generator (when such data can be obtained)
- Name of the driver, tag number of the vehicle, carrier name, address, phone number, and contact person (when such data can be obtained)

4.3 PROPER STORAGE AND DISPOSAL OF REJECTED WASTE

Any incoming load can be subject to inspections either based on an established random inspection schedule or due to suspicions regarding the nature of the waste, the generator, or the transporter. If the waste does not pass the inspections, i.e., prohibited, unknown, or suspicious wastes are found during the inspection, then the owner, operator, or assigned personnel can refuse to accept the waste at the facility, and the waste will remain the responsibility of the transporter. As a minimum response procedure, the landfill personnel should implement the following steps to deal with rejected or prohibited wastes encountered at the facility:

- Segregate the wastes
- Question the driver
- Contact possible source
- Call the appropriate State or Federal facility for disposal
- Use appropriate protective equipment
- Contact laboratory support if required
- Notify a response agency if necessary

If the owner or operator is unable to identify the transporter who brought the hazardous waste, the owner or operator must ensure that the waste is managed in accordance with all applicable Federal and State regulations. If the wastes are to be transported from the facility, the waste must be: (1) stored at the MSWLF facility in accordance with applicable regulations (2) manifested, (3)

transported by a licensed transporter, and (4) sent to a permitted Treatment, Storage, or Disposal (TSD) facility for disposal. These requirements are discussed further in this section.

Operators of MSWLF facilities should be prepared to handle hazardous wastes that are inadvertently received at the MSWLF facility. This may include having containers such as 55-gallon drums available on-site and retaining a list of names and telephone numbers of the nearest haulers licensed to transport hazardous waste. Storage and disposal of hazardous waste must comply with all applicable requirements in 40 CFR Part 262, based upon generator category (very small quantity, small quantity, and large quantity) classification.

If the owner or operator transports the wastes off-site, the owner or operator must comply with 40 CFR Part 262 or the analogous State requirements. The owner or operator is required to:

- Obtain an EPA identification number (EPA form 8700-12 may be used to apply for an EPA identification number)
- State or Regional personnel may be able to provide a provisional identification number over the telephone
- Package the waste in accordance with Department of Transportation (DOT) regulations under 49 CFR Parts 173, 178, and 179 (the container must be labeled, marked, and display a placard in accordance with DOT regulations on hazardous wastes under 49 CFR Part 172)
- Properly manifest the waste by designating a permitted facility to treat, store, or dispose the hazardous waste

PCB wastes containing more than or equal to 50 ppm PCB concentrations detected at an MSWLF facility must be stored and disposed according to 40 CFR Part 761. The owner or operator is required to:

- Obtain an EPA PCB identification number
- Properly store the PCB waste
- Mark containers or items with the words "Caution: contains PCBs"
- Manifest the PCB waste for shipment to a permitted incinerator, chemical waste landfill, or high-efficiency boiler (depending on the nature of the PCB waste) for disposal

The proper disposition/remediation of the prohibited waste will be specific to the waste and implemented upon occurrence and approval by the ODEQ.

Verification of proper disposal of the prohibited waste will be submitted to the ODEQ and a copy will be maintained in the operating record of the facility.

4.4 NHIW TRACKING DOCUMENT OR MANIFEST

Records shall be maintained in the operating record itemizing the type, quantity, and source of NHIW received from persons disposing greater than 10 cubic yards of NHIW in a calendar month. Such records shall be submitted to the ODEQ no later than the last day of the month following the reporting month. A copy of the NHIW Tracking Document is included in Appendix D.

5.0 PERSONNEL TRAINING

All gate attendants and disposal facility operators shall receive an initial 8 hours of basic training and at least 4 hours per year of annual refresher training in waste exclusion and radioactivity, as related to the WEP. Documentation of WEP training shall be kept within Appendix E of the WEP.

The training program should emphasize methods to identify containers and labels typical of hazardous waste and other prohibited wastes. Training also should address hazardous waste handling procedures, safety precautions, and recordkeeping requirements. This information is provided in training courses designed to comply with the Occupational Safety and Health Act (OSHA) under 29 CFR §1910.120. Information covered in these courses includes regulatory requirements under 40 CFR Parts 260 through 270, 29 CFR Part 1910, and related guidance documents that discuss such topics as general hazardous waste management; identification of hazardous wastes; transportation of hazardous wastes; standards for hazardous waste treatment; storage and disposal facilities; hazardous waste worker health and safety training; and monitoring requirements.

5.1 CURRICULUM

The training program should include, as a minimum, the following topics:

- Overview of RCRA and Subtitles C and D Programs
- Regulations and procedures for NHIW acceptance and exclusion
- Waste identification and evaluation, including:
    - Methods to identify containers and labels typical of hazardous, radioactive, PCB, infectious biomedical, and asbestos wastes
    - Methods to identify hazardous wastes and exclusions
    - Basics about the chemistry related to the physical characteristics of wastes
- Waste approval procedures
- Random inspections
    - Procedures for completing random inspections
    - How to utilize Manifest Checklist
- Waste rejection procedures
    - Notifications of rejected wastes
    - Storage, disposal, and verification of disposal of rejected/prohibited wastes
- Overview of analytical methods, including:
    - Type of testing required for the characterization of different wastes
    - Type of information that should be included in test/laboratory reports
    - Interpretation of analytical test results
    - Significance of laboratory QA/QC procedures
- Record keeping
    - Type of information required to be recorded
    - Monthly reports requirements
    - Procedures for submission of records to State Agencies
- Regulatory procedures for proper notification, certification, and handling of NHIW

- Facility's approved programs regarding PCB, radioactive, asbestos, medical wastes, and other prohibited wastes exclusion
- Sources of alpha, beta, and gamma radiation and radiation safety
- Overview of WEP implementing procedures

5.1.1 Regulatory Definitions

Waste is considered hazardous if any of the following criteria are met:

- Ignitability – flash point below 140°F
- Corrosivity – pH < 2 or pH > 12.5
- Reactivity – normally unstable and readily undergoes violent change
- Toxicity – Toxicity Characteristic Leaching Procedure (TCLP) exceeds "Rule of Twenty"

Radioactive Material - any solid, liquid, or gas that emits radiation spontaneously.

Polychlorinated Biphenyls (PCB) Waste – any waste containing PCB concentrations greater than or equal to 50 ppm.

Regulated Medical Waste – any waste or reusable material that contains an etiologic agent and is generated in the diagnosis, treatment, or immunization of human beings or animals; research pertaining to the diagnosis, treatment, or immunization of human beings or animals; or the production or testing of biological products.

Friable Asbestos – any material containing > 1% asbestos, which when dry can be crumbled, pulverized, or reduced to powder by hand.

Nonfriable asbestos – any material containing > 1% asbestos, which when dry cannot be crumbled, pulverized, or reduced to powder by hand.

Liquid waste – any waste material that is determined to contain "free liquid" as defined by the paint filter test.

Special Waste - any wastes that are not hazardous wastes but which, because of their nature or volume, require special or additional handling aside from that given to routine household refuse. This includes but is not limited to sludge, septic tank sludge, grease trap wastes, dead animals, packing house offal and tankage, waste fats and oils, hatchery wastes, cannery waste, process residue and waste, incinerator ash or residue, tires, chemical waste, nonfriable asbestos wastes, spent herbicide and pesticide containers.

Appendix A

Examples of Non-Hazardous Industrial Waste Special Waste and Management Options

Examples of Non-Hazardous Industrial Waste

1. Air pollution control equipment residues
2. Arsenically-treated wood that meets the exemption criteria of 40 CFR 261.4(b)(9)
3. Auto shredder fluff
4. Blasting media and other abrasives used to remove surface coatings
5. Coal combustion ash per 40 CFR 261.4(b)(4)
6. Combustible materials as defined in 49 CFR 173.120 and 173.124, that are not regulated as hazardous wastes
7. Containers that are RCRA empty in accordance with 40 CFR 261.7, or empty containers which have held pesticides (i.e., herbicides, fungicides, or rodenticides)
8. Cooling tower waters and other cooling process-related wastes
9. Incinerator ash
10. Industrial sludges and industrial mud trap residues
11. Industrial wastewater treatment plant sludge (excluding sludge that is exclusively sanitary sewage)
12. Ink wastes
13. Lab-related wastes, including lab packs
14. Lighting fixture ballasts containing non-TSCA regulated PCBs per CFR Part 761
15. Miscellaneous chemical spill residue, primarily non-fuel-related
16. Municipal and non-industrial wastewater treatment plant sludges
17. Non-hazardous pesticides (i.e., herbicides, fungicides, & rodenticides)
18. Oil filters meeting the requirements of 40 CFR 261.4(b)(13)
19. Outdated and off-specification products
20. Outdated, off-specification, or mislabeled over-the-counter medicines that are not hazardous in accordance with 40 CFR 261, Subparts C or D
21. Paint waste and related solvents
22. Petroleum-contaminated soil and debris, oily rags and absorbents with > 1000 ppm TPH
23. Pharmaceutical waste not identified in (20)
24. Refractory & foundry sands and slag, retort, fly ash, cement kiln dust
25. Resins, polymers, and adhesives
26. Sludges containing materials washed from the interior of bulk materials carriers such as tank trucks or railroad tank cars
27. Wastes exempted by the RCRA Bevill waste exclusion in 40 CFR 261.4(b)(7)
28. Wastes rendered non-hazardous that were formerly hazardous pursuant to 40 CFR 261, Subpart C
29. Unknowns
30. Wastes from metal plating processes

Special Waste and Management Options

Waste Type	Management Option
Car wash sumps	Waste from car wash sumps may be accepted without any special testing. Car wash sumps must be bulked in accordance with the facility's liquid bulking plan and pass the Paint Filter Liquid Test (PFLT).
Dry cleaning wastes	Filters and sludges from VSQG should not be accepted for disposal without confirming generators have complied with all requirements specified under State regulations and the waste has been approved for disposal by the facility.
Empty drums	Drums must contain less than 1 inch of product and the bung should be removed. Drums should be crushed prior to disposal. Clean drums (triple-rinsed by generator) in good condition can be stockpiled for reuse as waste containers, used oil storage containers, or recycled.
Floor sumps	All sump wastes must be screened, managed, and disposed in accordance with an approved permit. Floor sumps must be bulked in accordance with the facility's liquid bulking plan and pass the PFLT.
Fluorescent tubes/ ballasts	Fluorescent light tubes contain mercury and may exhibit hazardous waste characteristics (D009). Generators must manage fluorescent light tubes under the Universal Waste Rule and cannot dispose in the landfill if the material tests hazardous. Ballasts manufactured before 1979 may contain small quantities of PCBs. Fluorescent tubes and ballasts may be accepted from households, but cannot be accepted from VSQGs if they are hazardous or contain PCBs ≥ 50ppm. If the ballasts are suspected of containing PCBs, they should be placed in a bucket and mixed with cement prior to disposal.
Grease trap wastes	Grease trap wastes must be bulked in accordance with the facility's liquid bulking plan and pass the PFLT. Generators should be encouraged to recycle this waste.
Grit and bar screen wastes	These wastes must pass the PFLT and must be covered immediately.
Infectious/ Non-infectious/ Red bag waste	Infectious wastes from hospitals, medical clinics, mortuaries, health care units, dental offices, etc. should not be accepted unless properly treated. Non-infectious waste can be containerized in a properly labeled red bag. "Sharps" (needles, syringes, scalpels) should be placed in rigid containers with lids (i.e. 5-gallon plastic buckets or plastic milk jugs) and must be encapsulated in a mixture that will solidify.
Lab chemicals	Laboratory chemicals should not be accepted for disposal without confirming generators have complied with all requirements and the waste has been approved for disposal at the facility.
Latex/oil base paints and cans	Empty cans can be crushed and disposed. Small volumes of paint from households should be absorbed, dried, or solidified prior to disposal.
Lead-acid batteries	Lead-acid batteries should be stockpiled for recycling in an upright, non-leaking position, no more than 2 batteries high, on a pallet. **Lead Batteries, which are not household hazardous waste, MAY NOT be disposed in a landfill*
Liquids.	Bulk or non-containerized liquid waste may not be placed in landfills unless: (1) The waste is household waste other than septic waste; or (2) The waste is leachate or gas condensate derived from the MSWLF which is designed with a composite liner and leachate collection systems; or (3) The waste is sufficiently bulked with soil or other previously approved bulking agent to pass the PFLT prior to disposal. A container holding liquid waste may not be placed in an MSWLF unless: (1) the container is a small container similar in size to that normally found in

	household waste; (2) the container is designed to hold liquids for use other than storage; or (3) the waste is household waste. Class B municipal sewage sludge passing the PFLT may be co-disposed in an MSWLF which is in compliance with OAC 252:515 **Liquid waste MAY NOT be directly disposed in the working face of the landfill. They should be bulked in accordance with the approved liquid bulking plan prior to disposal.*
PCB wastes	Electrical transformers and soils contaminated with PCBs must have concentrations below 50 ppm and generators have complied with all requirements and the waste has been approved for disposal at AEL.
Pesticide containers	Pesticide containers must be empty, triple-rinsed, and punctured. The containers should be crushed prior to disposal
Petroleum contaminated waste	Petroleum-contaminated soil and debris, oily rags and absorbents can be disposed as de minimis waste if the TPH level is < 1,000 ppm.
Sewage treatment plant sludges	Sludges must be treated to Class B requirements, pass the PFLT, and be tested for hazardous waste characteristics using the TCLP. Sludges that are accepted for disposal must be covered immediately. Properly treated sludges may be suitable for use as soil supplements in reclaimed areas. Please contact the ODEQ regarding specific requirements. NOTE: Prior approval must be obtained from the department for any sludge management plan.
Tires	Whole tires should be placed at the bottom of the working face.
Treated wood	Railroad ties, bridge timbers, fence posts, telephone poles, and other materials treated with pentachlorophenol, creosote, or arsenic may exhibit hazardous waste characteristics (D004, D023, D024, D025, D026, D037). However, if the treated wood is quite old, it may be reasonable to assume that it will not exhibit these characteristics and that it may be accepted for disposal without testing. If new and not exempt, recently treated wood waste should be analyzed for hazardous waste characteristics.
Used oil	Used oil may not be accepted from do-it-yourself oil changers for recycling or emergency recovery (burning in a space heater) unless the landfill has an approved recycling plan. Used oil should not be accepted from local businesses. Oil storage should occur in an approved and labeled barrel or tank with secondary containment. Other used oil materials classified as NHIW such as tank bottoms, etc, can be accepted at the landfill but should be first managed in the solidification area. **Used oil MAY NOT be directly disposed in the working face of the landfill. The material should be bulked in accordance with the approved liquid bulking plan prior to disposal.*
Used oil filters	Used oil filters must be drained of all free liquids prior to disposal. NOTE: Spin-on used oil filters must be punctured or crushed to be exempt from a hazardous waste classification. Otherwise, they must be tested.
Water treatment sludges	Sludges must pass the PFLT or should be handled in accordance with the liquid bulking plan approved in the facility's permit.
White goods containing CFCs	If chlorofluorocarbons (CFCs) have been removed from the white good (refrigerator, freezer, or air conditioner), they can be stockpiled for recycling or crushed and disposed. If the CFCs have not been removed from the white good, they must be rejected or stockpiled in a separate area for removal of CFCs at a later date.
Wood and coal ashes	Hot and coal ashes (including fly ash and bottom ash) should be placed in a separate area where they can be spread out by landfill equipment and fully cooled prior to disposal.

*PFLT – Paint Filter Liquid Test (EPA Method SW-846/9095)

Appendix B

Hazardous Waste Identification (HWID) Process

Hazardous Waste Identification (HWID) Process

The Environmental Protection Agency (EPA) regulates all waste in the United States under the Resource Conservation and Recovery Act (RCRA). The three programs established under RCRA are Solid Waste (Subtitle D), Hazardous Waste (Subtitle C), and Underground Storage Tanks (USTs). RCRA Subtitle C establishes a federal program to manage hazardous wastes from cradle to grave. That includes regulations for the generation, transportation, treatment, storage, or disposal of hazardous wastes.

The term "hazardous waste" means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may:

- Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed, or otherwise managed

Proper hazardous waste identification (HWID) is essential to ensure the proper handling and disposal of waste; however, this can be a complex task. Therefore, the best approach for the identification of hazardous wastes consists of answering the following four questions:

- Is the material a *solid waste*? (See: *40 CFR Part 261.2*)
- Is the waste *specifically excluded from RCRA*? (*40 CFR Part 261.4*, See examples in Appendix A).
- Is the waste a *listed hazardous waste*? (*40 CFR Part 261.30*)
- Does the waste exhibit a *characteristic of hazardous waste*? (*40 CFR Part 261.20*)

The subsequent sections examine these key questions.

SOLID WASTE

The Subtitle C program uses the term solid waste to denote something that is a waste. In order for a material to be classified as hazardous waste (HW), it must first be a solid waste. The statutory definition points out that whether a material is a solid waste is not based on the physical form of the material (i.e., whether or not it is a solid as opposed to a liquid or gas), but rather that the material is a waste. The regulation further defines solid waste as any material that is discarded by being either: abandoned, inherently waste-like, a certain military munition, or recycled.

Once the material has been identified as a solid waste, then it can be classified as either hazardous or non-hazardous waste. Following the HWID process, the next step is to determine whether the solid waste in hand is subject to any sort of exclusions from the definition of hazardous waste, as described in the next section.

WASTES EXCLUDED FROM RCRA SUBTITLE C REGULATION

Not all RCRA wastes qualify as hazardous wastes. There are four categories excluded from being considered a RCRA hazardous waste. If the waste fits one of these categories, it is not regulated as a RCRA hazardous waste, and the hazardous waste requirements do not apply.

Below are some of the exclusions from the definition of solid waste:

- Domestic sewage and mixtures of domestic sewage
- Industrial wastewater discharges (point source discharges)
- Irrigation return flows
- Radioactive waste
- In-situ mining waste
- Pulping liquors
- Spent sulfuric acid
- Closed-loop recycling
- Spent wood preservatives
- Coke by-product wastes
- Splash condenser dross residue
- Recovered oil from petroleum refining operations
- Condensates from Kraft mill stream strippers
- Comparable fuels
- Processed scrap metal
- Shredded circuit boards
- Mineral processing secondary materials

EPA excludes certain solid wastes from the definition of hazardous waste. If a material meets an exclusion from the definition of hazardous waste, it cannot be hazardous waste, even if the material technically meets a listing or exhibits a characteristic that would make it hazardous. The four categories of waste which are excluded from the definition of hazardous waste are:

- Household Waste
- Agricultural Waste
- Mining Overburden Waste
- Fossil Fuel Combustion Waste

Following are solid wastes which are exempt from the definition of hazardous waste as per 40 CFR 261.4(b):

- §261.4(b)(1) Household Hazardous Waste
- §261.4(b)(2) Agricultural Waste
- §261.4(b)(3) Mining Overburden
- §261.4(b)(4) Fossil Fuel Combustion Waste (Bevill)
- §261.4(b)(5) Oil, Gas, and Geothermal Wastes
- §261.4(b)(6) Trivalent Chromium Wastes
- §261.4(b)(7) Mining and Mineral Processing Wastes (Bevill)
- §261.4(b)(8) Cement Kiln Dust (Bevill)
- §261.4(b)(9) Arsenical Treated Wood
- §261.4(b)(10) Petroleum Contaminated Media & Debris from Underground Storage Tanks
- §261.4(b)(11) Injected Groundwater
- §261.4(b)(12) Spent Chlorofluorocarbon Refrigerants
- §261.4(b)(13) Used Oil Filters
- §261.4(b)(14) Used Oil Distillation Bottoms
- §261.4(b)(15) Landfill Leachate or Gas Condensate Derived from Certain Listed Wastes
- §261.4(b)(17) Low-Level Mixed Wastes
- §261.4(b)(18) Solvent-Contaminated Wipes

Hazardous wastes generated in raw material, product storage, or process (e.g. manufacturing) units are exempt from Subtitle C hazardous waste regulation while the waste remains in such units. These units include tanks, pipelines, vehicles, and vessels used either in the manufacturing process or for storing raw materials or products, but specifically do not include surface impoundments. Once the waste is removed from the unit, or when a unit temporarily or permanently ceases operation for 90 days the waste is considered generated and is subject to regulation.

Hazardous waste samples are small, discrete amounts of hazardous waste that are essential to ensure accurate characterization and proper hazardous waste treatment. In order to facilitate the analysis of these materials, RCRA exempts characterization samples and treatability study samples from Subtitle C hazardous waste regulation.

Very small quantity generators (VSQG) waste includes listed hazardous wastes or wastes that exhibit a characteristic of hazardous waste that are generated in quantities no greater than 100 kg/month, or for acute hazardous waste, 1 kg/month. Provided that the VSQG meets all the conditions for exemption listed in 40 CFR §262.14, hazardous waste generated by the VSQG is not subject to the requirements of parts 124, 262 (except §§ 262.10 through 262.14) through 268, and 270, and the notification requirements of section 3010 of RCRA and the VSQG may accumulate hazardous waste on site without complying with such requirements.

After it is determined that a waste is a solid waste and is not either excluded from the definitions of solid or hazardous waste or exempt from Subtitle C hazardous waste regulation, the next step is to determine if the waste is a regulated hazardous waste.

A solid waste is a regulated hazardous waste if it:

- is listed in Subpart D of 40 CFR Part 261 (termed a "listed" waste)
- exhibits a characteristic of a hazardous waste as defined in Subpart C of 40 CFR Part 261
- is a mixture of a listed hazardous waste and a non-hazardous solid waste

LISTED WASTES

EPA determined that some specific wastes are hazardous. These wastes are incorporated into lists published by the Agency. These lists are organized into three categories:

The F-list (non-specific source wastes). This list identifies wastes from common manufacturing and industrial processes, such as solvents that have been used in cleaning or degreasing operations. Because the processes producing these wastes can occur in different sectors of industry, the F-listed wastes are known as wastes from non-specific sources. Wastes included on the F-list can be found in the regulations at 40 CFR §261.31. The F list wastes can be divided into seven groups, depending on the type of manufacturing or industrial operation that creates them:

- Spent solvent wastes (codes F001 – F005)
- Electroplating and other metal finishing wastes (codes F006 – F012, and F019)
- Dioxin-bearing wastes (codes F020 – F023, and F026 – F028)
- Chlorinated aliphatic hydrocarbons production wastes (codes F024 and F025)
- Wood preserving wastes (F032, F034, and F035)
- Petroleum refinery wastewater treatment sludges (F037 and F038)
- Multisource leachate (F039)

The K-list (source-specific wastes). This list includes certain wastes from specific industries, such as petroleum refining or pesticide manufacturing. Certain sludges and wastewater from treatment and production processes in these industries are examples of source-specific wastes. Wastes included on the K-list can be found in the regulations at *40 CFR §261.32*.

To determine if a waste qualifies as K listed, a facility must first determine whether the waste fits within one of the 17 different industrial or manufacturing categories on the list. Second, a facility must determine if this waste matches one of the detailed K-list waste descriptions in *40 CFR §261.32*. The 17 industries that generate K-list waste are:

- Wood preservation
- Organic chemicals manufacturing
- Pesticides manufacturing

- Petroleum refining
- Primary copper production
- Primary zinc production
- Ferroalloys production
- Veterinary pharmaceuticals manufacturing
- Inorganic pigment manufacturing
- Inorganic chemicals manufacturing
- Explosives manufacturing
- Iron and steel production
- Primary lead production
- Primary aluminum production
- Secondary lead processing
- Ink formulation
- Coking (processing of coal to produce coke, a material used in iron and steel production)

The P-list and the U-list (discarded commercial chemical products). These lists include specific commercial chemical products in an unused form. Some pesticides and some pharmaceutical products become hazardous waste when discarded. Wastes included on the P- and U-lists can be found in the regulations at *40 CFR §261.33*. For a waste to qualify as P- or U-listed, the waste must meet the following three criteria:

- The waste must contain one of the chemicals listed on the P or U list
- The chemical in the waste must be unused
- The chemical in the waste must be in the form of a CCP

For purposes of the P and U lists, a CCP is a chemical that is one of the following: 100% pure, technical (e.g. commercial) grade, or the sole active ingredient in a chemical formulation.

CHARACTERISTIC WASTES

Waste that has not been *specifically listed* may still be considered hazardous waste if it exhibits one of the four characteristics defined in *40 CFR Part 261 Subpart C* - **ignitability (D001), corrosivity (D002), reactivity (D003), and toxicity (D004 - D043).**

Ignitability - Ignitable wastes can create fires under certain conditions, are spontaneously combustible, or have a flash point less than 60 °C (140 °F). Examples include waste oils and used solvents. For more details, refer to 40 CFR §261.21. Test methods that may be used to determine ignitability include the Pensky-Martens Closed-Cup Method for Determining Ignitability (Method 1010A), the Setaflash Closed-Cup Method for Determining Ignitability (Method 1020B), and the Ignitability of Solids (Method 1030).

Corrosivity - Corrosive wastes are acids or bases (pH less than or equal to 2, or greater than or equal to 12.5) that are capable of corroding metal containers, such as storage tanks, drums, and barrels. Battery acid is an example. For more details, refer to 40 CFR §261.22. The test method that may be used to determine corrosivity is the Corrosivity Towards Steel (Method 1110A).

Reactivity - Reactive wastes are unstable under "normal" conditions. They can cause explosions, toxic fumes, gases, or vapors when heated, compressed, or mixed with water. Examples include lithium-sulfur batteries and explosives. For more details, see 40 CFR §261.23. There are currently no test methods available.

Toxicity - Toxic wastes are harmful or fatal when ingested or absorbed (e.g., containing mercury, lead, etc.). When toxic wastes are land disposed, contaminated liquid may leach from the waste and pollute ground water. Toxicity is defined through a laboratory procedure called the Toxicity Characteristic Leaching Procedure (TCLP) (Method 1311). The TCLP helps identify wastes likely to leach concentrations of contaminants that may be harmful to human health or the environment. Limits of TCLP are provided in Appendix C. For more details, refer to 40 CFR §261.24.

Appendix C

TCLP Limits

TCLP Limits

Heavy Metals	EPA HW Code	EPA Method	Regulated Level (mg/l)
Arsenic (As)	D004	7061/6010	5.0
Barium (Ba)	D005	7081/6010	100.0
Cadmium (Cd)	D006	7131/6010	1.0
Lead (Pb)	D008	7421/6010	5.0
Chromium (Cr)	D007	7191/6010	5.0
Mercury (Hg)	D009	7470/6010	0.2
Selenium (Se)	D010	7741/6010	1.0
Silver (Ag)	D011	7761/6010	5.0

Volatiles	EPA HW Code	EPA Method	Regulated Level (mg/l)
Benzene	D018	8240 or 8260	0.5
Carbon Tetrachloride	D019	8240 or 8260	0.5
Chlorobenzene	D021	8240 or 8260	100.0
Chloroform	D022	8240 or 8260	6.0
1,2-Dichloroethane	D028	8240 or 8260	0.5
1,1-Dichloroethylene	D029	8240 or 8260	0.7
Methyl ethyl ketone	D035	8240 or 8260	200.0
Tetrachloroethylene	D039	8240 or 8260	0.7
Trichloroethylene	D040	8240 or 8260	0.5
Vinyl Chloride	D043	8240 or 8260	0.2

Semi-Volatiles	EPA HW Code	EPA Method	Regulated Level (mg/l)
Cresol	D026	8270	200.0
o-Cresol	D023	8270	200.0
m-Cresol	D024	8270	200.0
p-Cresol	D025	8270	200.0
1,4-Dichlorobenzene	D027	8240 or 8270	7.5
2,4-Dinitrotoluene	D030	8270	0.13
Hexachlorobenzene	D032	8270	0.13
Hexachlorobutadiene	D033	8270	0.5
Hexachloroethane	D034	8270	3.0
Nitrobenzene	D036	8270	2.0
Pentachlorophenol	D037	8270	100.0
Pyridine	D038	8270	5.0
2,4,5-Trichlorophenol	D041	8270	400.0
2,4,6-Trichlorophenol	D042	8270	2.0

Pesticides	EPA HW Code	EPA Method	Regulated Level (mg/l)
Chlordane	D020	8080	0.03
Endrin	D012	8080	0.02
Heptachlor	D031	8080	0.008
Lindane	D013	8080	0.4
Methoxychlor	D014	8080	10.0
Toxaphene	D015	8080	0.5
Herbicides	**EPA HW Code**	**EPA Method**	**Regulated Level (mg/l)**
2,4-D	D016	8150	10.0
2,4,5-TP (Silvex)	D017	8150	1.0

Appendix D

ODEQ NHIW Certification Form

Waste Profile Form

Gate Attendant Checklist

NHIW Random Inspection Form

Waste Rejection Form

NHIW Tracking Document

NHIW Manifest Form

NHIW Monthly Report Form

ODEQ NHIW Certification Form

NHIW CERTIFICATION

OKLAHOMA
DEPARTMENT OF ENVIRONMENTAL QUALITY

Please read instructions prior to completing this form

Generator Name:_____

Mailing Address:_____ **City** _____ **State** ok **Zip** _____

Point of Generation
Address: _____ **City** _____ **State** ____ **Zip** _____

Generator Contact: _____ **Title** _____ **Telephone** _____

Email Address:_____

DETAILED WASTE DESCRIPTION

Waste Name:_____

If waste was generated out-of-state, is it classified as hazardous in the state of origin? ☐ **Yes** ☐ **No** ☐ **NA- Okla. waste**

Approximate amount of waste to be disposed:

_____

Disposal frequency:

☐ **Tons** ☐ **Pounds** ☐ **One-time** ☐ **Weekly**
☐ **Cubic yards** ☐ **Drum** ☐ **Monthly** ☐ **Annually**
☐ **Other** _____

Physical characteristics:

☐ **Solid** ☐ **Liquid**
☐ **Sludge** ☐ **Combination**

Method used to determine waste is non-hazardous: ☐ **Analysis** ☐ **Generator knowledge** ☐ **Both**

Process generating waste (be specific and use additional sheets if necessary):

_____

_____

_____

_____

_____

DESIGNATED RECEIVING LANDFILL

Name: _____ **Permit #:** _____

GENERATOR CERTIFICATION

I understand this form must be signed by the original waste generator or other persons authorized by 27A O.S§2-10-501(H).

To the best of my knowledge, I certify:

- **The information contained herein is accurate, complete, and representative of the waste to be disposed;**
- **The waste identified above is not a characteristically hazardous waste as identified by 40 CFR 261, Subpart C, is not a listed hazardous waste as identified by 40 CFR 261, Subpart D or contaminated with a listed hazardous waste, and is not otherwise identified as a hazardous waste by the Department of Environmental Quality; and**
- **This waste will be managed in accordance with all applicable statutes and rules of the Department of Environmental Quality.**

_____
Generator Signature

_____
Printed name **Title** **Date**

INSTRUCTIONS FOR COMPLETING THE NHIW CERTIFICATION

Enter the name of the generating facility, generator mailing address, address where the waste was generated, contact name and title of person at the generating facility who is knowledgeable about the waste, and phone number.

DETAILED WASTE DESCRIPTION

1. Identify the name of the waste.
2. Identify the approximate amount of waste to be disposed under the plan, its frequency of disposal, and its physical characteristics.
3. Identify if the waste was determined to be non-hazardous by either knowledge of process, testing, or both. If requested by DEQ, the generator must be able to provide information about the waste, such as a list of chemical constituents entering into the waste and a list of chemical constituents likely to be in the waste, laboratory analyses, MSDS sheets, and other information used by the generator to determine the waste is non-hazardous.
4. Identify the process generating the waste. Please note that the waste generating description must be specific and sufficient to demonstrate the waste is non-hazardous.

DESIGNATED RECEIVING LANDFILL

Identify the name of the landfill to receive the waste and its DEQ permit number.

GENERATOR CERTIFICATION

Read the certification and sign and date the form. **Please note that the certification may only be dated and signed by one of the following:** 1) the original waste generator; 2) a person who identifies and is under contract with a generator and whose activities under the contract cause the waste to be generated; 3) a party to a remediation project under an order of the DEQ or under the auspices of the Oklahoma Energy Resources Board or other agencies of other states; or 4) a person responding to an environmental emergency.

The completed notification form should be submitted to the DEQ at the following mailing address or email address. Once submitted, the generator may dispose of the waste at the designated landfill.

Department of Environmental Quality
Solid Waste Compliance Unit
P. O. Box 1677
Oklahoma City, OK 73102
Phone (405) 702-5100
Fax (405) 702-5101

Email: nhiw-certifications@deq.ok.gov

Waste Profile Form

American Environmental Landfill, Inc.

"Leading the Industry in Environmental Compliance"

(MUST BE FILLED OUT COMPLETELY)

For more information, please call American Environmental Landfill, Inc. at (918)245-7786

A. GENERATOR INFORMATION

1. Generator Name _____
2. Site Location _____
3. City _____
   State _____ Zip Code _____
4. Phone _____
5. Fax _____
6. State Waste Code _____

B. CUSTOMER BILLING INFORMATION

1. Billed to Name _____
2. Address _____
3. City _____
   State _____ Zip Code _____
4. Phone _____
5. Fax _____
6. Contact _____
7. Title _____

ALL BLANKS MUST BE FILLED. IF NOT APPLICABLE PLEASE PUT N/A

C. WASTE STREAM INFORMATION

1. Common Name of Waste _____
2. Detailed Decription of Process Generating Waste and Material Description _____

3. Industrial Generator ☐Yes ☐No
4. Municipal Generator ☐Yes ☐No
5. Physical State at 70° ☐Solid ☐Semisold ☐Liquid ☐Powder ☐Combination
6. Odor ☐Yes ☐No Describe _____
7. Color _____
8. pH Range _____
9. Flash Point _____
10. Reactive ☐Yes ☐No With: _____
11. Free Liquid ☐Yes ☐No
12. Water content % by volume _____
13. Viscosity _____
14. Is the analytical attached dervied from testing a representative sample IAW 40 CFR 261? ☐Yes ☐No
15. Does the waste contain radioactive or U.S.D.O.T. hazardous waste materials? ☐Yes ☐No

D. SUPPLEMENTAL INFORMATION

☐None ☐MSDS ☐Analytical Data ☐Process Knowledge Number of pages attached _____

E. SHIPPING INFORMATION

1. Packaging ☐Bulk Liquid ☐Bulk Solid ☐Drum ☐Other _____ Shipping Frequency _____
2. Estimated Volume _____ ☐Gallons ☐Yards ☐Drums Other _____

F. GENERATOR / CUSTOMER CERTIFICATION

I hereby certify that all information submitted and all attached documents contain true and accurate descriptions of this waste. No deliberate or willful omissions of composition or properties exist, and all known or suspected hazards have been disclosed. I further certify that the waste is not designated a Hazardous Waste as defined by the USEPA in 40 CFR 261, nor does it contain PCBs regulated under TSCA 40 CFR 761.

I, _____ am employed by _____ and am authorized to sign this request for _____

(Company Name) (Signature) (Date)

LANDFILL USE ONLY (DO NOT WRITE IN THIS SPACE)

Compliance Officer _____

Date _____ ☐ Approved ☐ Rejected

Additional Information _____

Current WDA on file ☐ Yes ☐ No

Job # _____

Post Review Profile Checklist

Post Review Profile Checklist

Date Completed: _____

Generator: _____

Type of Waste: _____

Assigned Job Number: _____

1. Compliance Officer has reviewed waste profile and NHIW forms
   Yes No N/A
2. Compliance Officer has reviewed 3rd Party analytical including QC Data
   Yes No N/A
3. Compliance Officer has reviewed MSDS provided including but not limited to; CAS no., names of chemicals, physical data, reactive data, disposal information and shipping data
   Yes No N/A
4. Compliance Officer has confirmed the process generating the waste is not a listed waste; P, K, F or U
   Yes No N/A
5. Compliance Officer has reviewed any information regarding process knowledge provided
   Yes No N/A

This form has been completed as a post review of the waste stream submitted for disposal at American Environmental Landfill, I recommend (circle one Acceptance/Rejection) of waste referenced above.

Compliance Officer Printed Name: _____

Compliance Officer Signature: _____

Gate Attendant Checklist

Gate Attendant Checklist

	YES	NO	N/A
Generator Waste Profile Sheet (GWPS) filled out and signed?			
ODEQ approval letter on file?			
Manifest completed and in order:			
Information in manifest match approval letter and/or GWPS?			
Manifest has been signed by generator?			
Manifest has been signed by transporter?			
Load volume has been verified?			
Cumulative volume does not exceed approval limit?			
Waste conforms to materials described in GWPS?			
Information regarding load has been logged into Operating Log Sheet?			
Manifest has been signed by landfill representative and copy placed on file?			
Remaining copies of the manifest have been forwarded to appropriate facilities via mail?			

N/A – Non-applicable

Checklist completed by:

Name (Print):

Signature: _____

Title: _____

Manifest Checklist

Manifest Checklist

1. **Confirm Job Number**
    a. **If job number is on the Manifest, confirm job number matches with profile on online database.**
    b. **If job number is not listed on the Manifest, inform driver to request job number from company hired to transport load or contact billing representative of waste material. Notify driver to exit scale and once job number is known, they may get back in line. Confirm job number matches with profile on online database.**
2. **Match Generator Name and Address to that listed on online database**
    a. **If they match then move on to the next step.**
    b. **If they do not match, contact the Bill To and/or Generator and resolve issue before proceeding to next step. Correct manifest accordingly.**
3. **Check Destination Facility Name**
    a. **If AEL or American Environmental Landfill is listed, proceed to next step.**
    b. **If AEL or American Environmental Landfill is not listed, contact the Bill To and/or Generator to verify load is at correct disposal facility. Correct manifest accordingly.**
4. **Match Waste Name on Online Database**
    a. **If waste name matches then proceed to next step.**
    b. **If the name does not match call bill to/generator.**
5. **Confirm transporter/driver has signed the Manifest**
6. **AEL Authorized Agent Signature, Ticket Number, and Truck Number**
    a. **After Input into the online database, sign and date Manifest.**
    b. **Add Ticket Number (top left corner) and Truck Number (top right corner) to the manifest.**
7. **If Manifest states Haz Manifest in the top left corner, write Non Haz in the Discrepancy Section towards the bottom of the manifest.**
8. **See Attached Example Sheets for where each item is located on the Manifest.**

-There is no time limit. Take what time you need to confirm everything is correct.

-If any concerns or issues are identified, ask the truck transport to exit the scale and call Todd at (918-813-2985).

6

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No.	Manifest Doc No.	2. Page 1 of 1	

GENERATOR

3. Generator's Name and Mailing Address

2

6

4. Generator's Phone (including area code)

5. Transporter 1 Company Name	6. US EPA ID Number	A. Transporter's Phone
7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Phone
9. Designated Facility Name and Site Address	10. US EPA ID Number	C. Facility's Phone

3

11. Waste Shipping Name and Description	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a.				
b.				
c.				
d.				

4 1

D. Additional Descriptions for Materials Listed Above	E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

4 1

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

5

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
	6			

ORIGINAL - RETURN TO GENERATOR

Please print or type (Form designed for use on elite (12 - pitch) typewriter)

Form Approved. OMB No. 2050 - 0039 Expires 9 - 30 - 91

UNIFORM HAZARDOUS WASTE MANIFEST

1 Generator's US EPA ID No. | Manifest Document No. | 2. Page 1 of | Information in the shaded areas is not required by Federal law

GENERATOR

3. Generator's Name and Mailing Address

4. Generator's Phone ( )

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name | 6. US EPA ID Number | C. State Transporter's ID | D. Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number | E. State Transporter's ID | F. Transporter's Phone

9. Designated Facility Name and Site Address | 10. US EPA ID Number | G. State Facility's ID | H. Facility's Phone

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.					
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR,** if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name | Signature | Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

7 Non Haz

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name | Signature | Month Day Year

EPA Form 8700 - 22 (Rev. 9 - 88) Previous editions are obsolete.

NHIW Random Inspection Form

NHIW Random Inspection Form

GENERAL INFORMATION (To be completed by transporter or landfill personnel)

Date and Time: _____
Waste Authorization #: _____
Generator Name: _____
Transporter Name: _____
License Plate Number: _____
Driver's Name: _____
Driver's License Number: _____
Source of Waste _____
Hauling Permit Number: _____
Waste Description: _____

INSPECTION OBSERVATIONS (To be completed by landfill personnel)

		COMMENTS
Hazardous waste labels or placards?	YES / NO	
PCB transformers, labels, or placards?	YES / NO	
Lead-acid batteries?	YES / NO	
Unrinsed pesticide containers?	YES / NO	
Bulk or containerized liquids?	YES / NO	
Free liquids present?	YES / NO	
Sludges, pastes, or slurries?	YES / NO	
Powders, dust, smoke, or vapors?	YES / NO	
Petroleum odors?	YES / NO	
Unusual odors?	YES / NO	
Other suspicious conditions?	YES / NO	
If YES, describe		

Photos taken? YES / NO (attach when available)
Will the waste pass the Paint Filter Liquid Test? YES / NO
Extraneous or unauthorized materials found in shipment? YES / NO
Waste accepted? YES / NO
If NOT ACCEPTED, complete *Waste Rejection Form.*

Signature (landfill inspector) Print Name Date

Waste Rejection Form

Waste Rejection Form

GENERAL INFORMATION (To be completed by transporter or landfill personnel)

Date and Time of Rejection: _____
Waste Authorization Number: _____
Waste Description: _____
Generator Name: _____
Generator Contact: _____
Generator Address & Phone #: _____
Transporter Name: _____
Transporter Contact: _____
Transporter Address & Phone #: _____
Driver's Name and License #: _____
Vehicle License Number: _____
Hauling Permit Number: _____

Reasons for Waste Rejection:

_____
_____
_____
_____

What happened to the rejected waste? (Who took it? Where?)

_____
_____
_____
_____

Notify the ODEQ by the next working day

Person contacted at the ODEQ: _____
Personnel that contacted the ODEQ: _____
Time: _____
Date: _____

ATTACH A COPY OF ANY ON-SITE TEST RESULTS (IF ANY) AND A COPY OF THE RANDOM WASTE INSPECTION FORM OR NON-HAZARDOUS WASTE MANIFEST.

_____

Signature of Site Inspector (Print Name) Date

Fax this copy to the ODEQ-Land Protection Division as part of the notification procedure (405) 702-5101

NHIW Tracking Document

NHIW Tracking Document

SECTION 1: GENERATOR INFORMATION	
Generator Name:	Phone Number:
Mailing Address:	
Address where waste was generated:	
WASTE INFORMATION	
Waste Code or #:	
Waste Description:	
Quantity:	Units:
Type:	
GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.	
Generator Authorized Agent Name	*Signature* *Date*

SECTION 2: TRANSPORTER INFORMATION	
TRANSPORTER 1	**TRANSPORTER 2**
Name:	Name:
Address:	Address:
Driver's Name:	Driver's Name:
Vehicle License #:	Vehicle License #:
Phone #:	Phone #:
Acknowledgment of Receipt of Materials	Acknowledgment of Receipt of Materials
Driver's Signature *Date*	*Driver's Signature* *Date*

SECTION 3: RECEIVING FACILITY INFORMATION	
Facility Name:	
Physical Address:	
Mailing Address:	
Phone Number:	
Discrepancy Indication Space:	
FACILITY CERTIFICATION: I hereby certify that the above-named material has been accepted and to the best of my knowledge the foregoing is true and accurate.	
Facility Authorized Agent Name	*Signature* *Date*

NHIW Manifest Form

American Environmental Landfill, Inc.

Leading the Industry in Environmental Compliance

Non-Hazardous Waste Manifest

Generator

Generator's Name: _____

Mailing Address: _____

_____
City State Zip

Point of Generation Address: _____

_____
City State Zip

Contact: _____
Name Phone

Manifest Job No. _____

Bill to Name: _____

Address: _____

_____
City State Zip

Contact: _____
Name Phone

Common Name of Waste Material	Container No.	Container Type	Total Quantity	Unit

I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations.

Generator Authorized Agent Name _____ Signature _____ Shipment Date _____

Transporter

Transporter Name: _____

Address: _____

City, State Zip: _____

Driver Name (Print): _____

Tag No. _____ State: _____

USDOT No. _____

I hereby certify that the above material was picked up at the generator site listed above.

Driver Signature _____ Ship Date _____

I hereby certify that the above named material was delivered without incident to the destination listed below.

Driver Signature _____ Delivery Date _____

Destination

American Environmental Landfill, Inc.
212 N. 177th W Ave.
Sand Springs, OK 74063

Phone: (918) 245-7786
Fax: (918) 245-7774
Permit No: 3557021

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is accurate.

Name of Authorized Agent _____ Signature _____ Receipt Date _____

White – Destination Retention • Yellow – Return to Bill to • Pink – Transporter Retain • Goldenrod – Generator Retain

NHIW Monthly Report Form

NHIW Monthly Report

Month/Year: Facility:_____ Permit Number:_____

Date	Generator Name	Waste Name	App #	Amount

DEQ Form #520-821R Revised July 1998

Appendix E

Personnel Training Record

Personnel Training Record

INSTRUCTOR NAME:

I_____certify that the personnel included in this list attended a training course and received training in the areas discussed in Section 5.0 of the Waste Exclusion Plan (WEP).

SIGNATURE: Date:

The undersigned state that they are familiar with the contents of the American Environmental Landfill WEP and that they have received the training to comply with the guidelines as set forth in Section 5.0 of the WEP.

NAME	TITLE	SIGNATURE	DATE

Appendix K

Closure and Post-Closure Plan

Closure and Post-Closure Plan
American Environmental Landfill

American Environmental Landfill, Inc.
207 North 177th West Avenue
Sand Springs, Oklahoma 74063

SCS ENGINEERS

27220345.00 | May 2024
Revised February 2025

8575 W. 110th Street, Suite 100
Overland Park, KS 66210
913-681-0030

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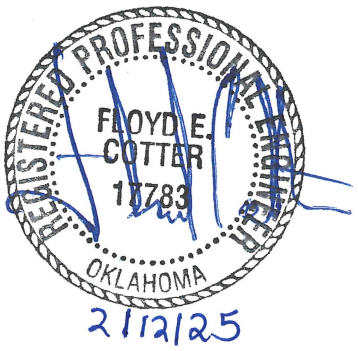
Certification

This report has been prepared for exclusive use by American Environmental Landfill, Inc. for the American Environmental Landfill (AEL) for specific application to the project discussed, and it has been prepared in accordance with good engineering practices including consideration of industry standards and the requirements of the Oklahoma Department of Environmental Quality.

Prepared by:



Floyd Cotter, PE
SCS Engineers

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1.0 INTRODUCTION

This Closure and Post-Closure Plan provides the criteria necessary to properly close and maintain the entire disposal area of the American Environmental Landfill (AEL).

The Closure Plan includes the necessary actions to be completed at the site before the facility can be certified closed and sets forth the maintenance and monitoring during the post-closure period.

The Post-Closure Plan will be in effect for a minimum 30-year period. The closed landfill facility will be maintained in order to retain its integrity and will not pose a threat to human health or the environment.

2.0 REGULATIONS

This Closure and Post-Closure Plan has been prepared pursuant to OAC 252:515, as promulgated by the Oklahoma Department of Environmental Quality (ODEQ).

2.1 CLOSURE REQUIREMENTS

OAC 252:515 requires that all Municipal Solid Waste Landfills (MSWLFs) install a final cover system that is designed to minimize infiltration and erosion. The final cover system will consist of an erosion layer/vegetation layer underlain by an infiltration/vegetation support layer. The facility will be closed in accordance with the provisions included in this Closure Plan and in a manner that minimizes the need for further maintenance and controls and minimizes post-closure escape of waste and waste constituents into the environment.

Prior to beginning the final closure of the landfill, the owner/operator is required to give notice of intent to close the site. ODEQ regulations require closure to begin a minimum of 90 days after the final receipt of waste at the facility or for the disposal area, as applicable. ODEQ requires completion of all closure activities within 180 days following the beginning of closure unless otherwise approved.

ODEQ requires a Certification of Final Closure to be prepared and sealed by an independent professional engineer licensed in the State of Oklahoma and signed by the site owner/operator.

ODEQ requires that upon approval of final closure, a notice shall be recorded in the property deed stating that the land has been used as a solid waste disposal facility. The notice shall specify the type, location, and quantity of wastes disposed of at the facility. In addition, the notice shall state that a survey plat and a record of disposal area locations and elevations have been filed with the ODEQ and with an identified city or county, and future uses may be restricted per OAC 252:515-25-57. A file-stamped copy of the notice shall be provided to the ODEQ.

ODEQ also requires Closure/Post-Closure cost estimates to be updated if additional active areas are constructed if the final cover is constructed, or if the landfill gas collection and control system (GCCS) is expanded. The cost estimates will be updated annually consistent with OAC 252:515-27-34.

2.2 POST-CLOSURE REQUIREMENTS

For current active landfills, OAC 252:515-25-51 requires a 30-year post-closure maintenance period including maintenance of the integrity and effectiveness of the final cover, maintaining and operating the leachate collection system, monitoring groundwater, and maintaining any gas venting, collection, or monitoring systems.

The ODEQ requires that a Certification of Post-Closure Performance be prepared and sealed by an independent professional engineer licensed in the State of Oklahoma.

3.0 FINAL COVER SYSTEM

3.1 COVER SYSTEM DESIGN

The final cover system for AEL consists of an Evapotranspiration (ET) alternative earthen final cover system. The components of the ET final cover system from top to bottom are listed below.

- A minimum 12-inch vegetation layer of earthen material capable of sustaining plant growth
- A minimum 24-inch vegetation support layer of earthen material
- A minimum 12-inch intermediate cover layer of earthen material

3.2 COVER SYSTEM INSTALLATION

The final cover should be constructed in accordance with the approved permit documents, design plans, and the Construction Quality Assurance / Construction Quality Control Plan (QA/QC) for Evapotranspiration Alternative Earthen Final Cover, dated April 2020, prepared by SCS Engineers, or more recently approved plan. The intermediate cover soils will be placed by the owner over the completed waste fill prior to installing the final cover system. The material used for the vegetation support layer shall be classified as CL, CH, ML, SM, or SC according to the Unified Soil Classification System. The vegetation support layer material should be placed in one 24-inch lift. The material will be compacted by tracking the material with low-pressure earth-moving equipment.

The vegetation layer will be placed over the vegetation support layer. This layer will consist of soil suitable for sustaining vegetative growth. The soil will be placed in one lift (12-inch minimum thickness) over the entire surface of the final cover and compacted in place with low-pressure earth-moving equipment.

Individual areas of the AEL may be closed in phases. For the construction of each final cover phase, project-specific design plans will be prepared and sealed by an independent professional engineer licensed in the State of Oklahoma, in accordance with the site's current permit documents and QA/QC plan. At this time, it is anticipated that the final cover will be constructed in one phase at the time of closure. To reduce financial assurance (FA) for the disposal area closed in a phased closure scenario, a certification prepared and sealed by an independent professional engineer licensed in the State of Oklahoma shall be submitted to the ODEQ. The ODEQ must approve the closure of the disposal area before FA may be reduced. The certification shall:

- Certify that the area was closed according to the approved permit documents, design plans, QA/QC plan, and applicable rules and regulations
- Contain a closure report with related drawings, plans, or specifications describing how the closure was performed

4.0 BORROW AREAS

Onsite and offsite soil borrow areas will be re-shaped and vegetated to blend in with the surrounding terrain within 180 days of the time that they are no longer utilized. After vegetation is established in the borrow areas, these areas will be routinely inspected throughout the life of the site and the Closure/Post-Closure periods. The vegetation cover will be capable of self-regeneration and will require no maintenance. If bare spots develop, then the area will be re-seeded and maintained (e.g., watered and fertilized) until the vegetation is re-established. Also, during these inspections, the slopes will be inspected and if necessary re-shaped to maintain their grades.

5.0 CLOSURE PROCEDURES

5.1 CLOSURE SEQUENCE

AEL will conduct ongoing closure of the landfill throughout its active life. This procedure allows for successive closures of fill areas by placement of final cover, construction of drainage and erosion control features, and establishment of vegetative cover. It is anticipated that, where possible, portions of the landfill will be closed as additional phases are constructed. If the site is to undergo premature closure, closure activities would be required only on those areas of the site that had been constructed and received waste. AEL will submit a permit modification to the ODEQ showing redesigned final contours and permanent stormwater structures in accordance with the Oklahoma Administrative Code Rules and Regulations prior to the premature closure of AEL.

5.2 CLOSURE DURING ACTIVE LIFE

As described above, the final cover will be constructed as fill areas to achieve the design grades. Should complete closure of the landfill become necessary at any time during the active life of the landfill, the following steps will be taken:

- Engineering plans will be developed to address site closure at the time of discontinued waste-filling
- The final waste received will be placed and properly compacted
- Excavations will be filled with suitable material, and the site will be graded to promote runoff and prevent ponding
- The final cover system will be constructed according to the specifications
- The top of the landfill will be re-graded and re-shaped as needed to provide the proper slope for positive drainage
- During the first growing season, following the application of final cover, the site will be vegetated with permanent vegetation
- Additional soil will be added to the side slopes, as needed, and processed using a disc to prepare the soil for seeding
- A surface water management system will be constructed to minimize erosion
- A closure certification report will be prepared by an independent registered professional engineer in the State of Oklahoma and submitted to ODEQ for approval
- All proper notices and documentation will be filed with the appropriate agencies

5.3 ADDITIONAL CLOSURE INFORMATION

There are numerous onsite structures. These structures along with all other structures that are on site at the time of final closure will be removed or decommissioned. All equipment used during the

operation and closure of the landfill will be removed from the site after the final closure has been certified as complete.

The access roads will be maintained throughout the active life and post-closure period of the landfill. Facilities at the site, including the perimeter fencing, will be maintained throughout the post-closure period.

Prior to initiating closure, the existing conditions and applicable regulations will be re-evaluated so that this Closure Plan is still applicable.

6.0 CLOSURE SCHEDULE

The site will be closed in an orderly fashion, consistent with OAC 252:515-25-33. The final closure schedule is as follows:

- The ODEQ shall be notified in writing prior to beginning final closure of AEL or closure of a disposal cell at AEL
- Closure activities shall begin no later than 90 days after the final receipt of wastes at AEL or the final receipt of wastes into a disposal cell
- Closure activities shall be completed according to the approved Closure Plan within 180 days after closure activities are initiated
- Extensions of the closure period may be granted by the ODEQ if AEL demonstrates that closure will, of necessity, take longer than 180 days, and that all steps have been taken, and will continue to be taken, to prevent threats to human health or the environment from the unclosed cell or facility

6.1 CERTIFICATION OF FINAL CLOSURE

Upon completion of closure activities, a professional engineer registered in the State of Oklahoma will submit a certification of final closure to the ODEQ, certifying that the facility or disposal cell was closed in accordance with approved permit documents and this closure plan. The certification of final closure shall:

- Be signed by the owner/operator
- State the facility was closed according to the approved closure plan, the permit documents, and applicable rules
- Contain a closure report with related drawings, plans, or specifications describing how the closure was performed
- Indicate whether inspection of gas, groundwater, or surface water monitoring has shown the presence of elevated levels of any constituent or if any evidence of contamination related to site operations has been found and, if so, what corrective measures were taken
- Include a final closure map

The final closure map shall show as-built conditions at the time of closure including but not limited to:

- Final contours of the entire site
- The final permit boundary and boundaries of disposal areas
- The location of gas monitoring probes

- The location of groundwater monitoring wells
- The location of leachate management systems or surface impoundments
- The location of permanent surface drainage structures
- Aesthetic enhancements
- Other relevant information

6.2 COUNTY LAND RECORDS NOTICE

The ODEQ shall approve the final closure of the facility before the post-closure period can begin. Upon approval of the final closure of the facility, a notice shall be recorded in the land records of the property for Osage County giving notice in perpetuity that the site was used for the disposal of municipal solid waste and is now closed. The notice shall specify the type, location, and quantity of waste disposed. The notice shall also identify the required post-closure monitoring period and state that the facility will be monitored for at least 30 years; that a survey plat and record of the disposal area's locations and elevations have been filed with the ODEQ and with an identified city or county; and that future uses may be restricted in accordance with OAC 252:515-25-57. AEL is responsible for providing a file-stamped copy of the notice to the ODEQ.

7.0 CLOSURE COST ESTIMATE

A closure cost estimate including costs for the activities described above, is provided in Appendix A. Closure estimates and the amount of FA provided must be increased if, at any time during the active life, changes to the closure plan of the facility increase the maximum cost of closure. Proposals for reduction of closure cost estimates and the amount of FA required must be submitted to the ODEQ for approval. To qualify for a reduction, the cost estimate must be demonstrated to exceed the minimum cost of closure during the remaining life of the facility, the amount of security remaining after the reduction must adequately cover the estimated closure cost yet to be performed, and FA shall not be reduced until ODEQ approval has been granted.

At a minimum, cost estimates for closure shall be adjusted no later than April 9th of each year; the adjustment must be submitted to the ODEQ for approval. In the adjustment, the maximum costs of closure may be recalculated, in current dollars, in accordance with OAC 252:515-27-51. If there are no significant changes to the closure plan, the cost estimate may be adjusted by use of an inflation factor derived from the most recent annual Implicit Price Deflator for Gross National Product or the Implicit Price Deflator for Gross Domestic Product published by the U.S. Department of Commerce in its Survey of Current Business in a year for which the adjustment is made. The approved adjusted cost estimate shall be placed in the operating record.

8.0 POST-CLOSURE ACTIVITIES

8.1 MONITORING AND MAINTENANCE

In accordance with OAC 252:515-25-51(b), post-closure care maintenance will commence immediately upon ODEQ approval of final closure. Post-closure activities will continue for a period of 30 years, unless the ODEQ approves a post-closure period of a different duration or if the post-closure period is extended pursuant to OAC 252:515-25-52. Documentation pursuant to OAC 252:515-3-34 is included in Appendix B of this plan showing that AEL has the legal right to access all property subject to post-closure care requirements.

Post-closure inspections shall be performed on a quarterly basis. Additional inspections may be conducted to observe repairs or evaluate problem areas discovered during prior inspections.

The quarterly post-closure inspections will consist of the inspection and evaluation of the final cover system and vegetative cover, the drainage and erosion control structures, the leachate collection system, and the security system. The frequency and specific inspections associated with the groundwater monitoring and gas monitoring programs are addressed in AEL's Groundwater Monitoring Plan and Explosive Gas Control Plan.

8.1.1 Final Cover

Post-closure care will verify the integrity of the final cover system and its ability to minimize infiltration and erosion. The following conditions should be examined during the inspection:

- Settlement
- Cracking
- Erosion
- Animal burrows
- Other disturbances affecting either the thickness or configuration of the final cover

Maintenance and repairs should be conducted as soon as practical and may consist of filling in areas of settlement, re-grading, and slope restabilization. In areas of substantial settlement or displacement of the final cover, the integrity of the cap should be re-evaluated and any necessary repairs made. The final cover should be maintained to provide the proper slope to promote surface water runoff and continuity of the soil components to minimize infiltration and leachate production. Settlement that occurs on side slopes of the landfill will generally not require re-grading or placement of additional cover to maintain surface drainage. Side slopes are designed no greater than a 4:1 (horizontal: vertical) slope, and the crown of the landfill area slopes at a minimum of four percent to minimize the effect of settlement. With these slope conditions, it is anticipated that minimal soil will be required during the post-closure care period for the maintenance of this site.

Included as part of the final cover system inspection, the integrity of the vegetation and its ability to minimize infiltration and erosion will be determined. The following conditions should be examined during the inspection:

- Erosion
- Overgrowth of shrubs, trees, and other deep-rooted vegetation
- Patches of dead vegetation

Maintenance and repairs of the vegetative cover may consist of the following activities:

- Reseeding, fertilizing, liming, and mulching of washed-out areas
- Brush removal
- Mowing

Reseeding should be conducted as necessary to facilitate proper vegetative growth over all areas of the final cover. Mowing and removal of deep-rooted brush and vegetation should be performed as necessary during the growing season.

8.1.2 Borrow Area Reclamation

The borrow areas will have a gently sloping topography to provide wet weather drainage. The borrow area will be excavated in a manner that results in final contours similar to those present before disturbance, except the area will have a lower elevation. The areas will be excavated in a manner to provide positive drainage and possibly create one or more impoundments. In the case that impoundments are proposed/constructed, all applicable permits will be obtained and copies provided to the ODEQ.

Activities will be scheduled to minimize erosion and sedimentation. The borrow area will be re-graded in a manner to provide sufficient soil material for the re-establishment of vegetation. Re-vegetation activities will be completed as needed during the spring or fall growing seasons.

8.1.3 Drainage and Erosion Controls Structures

Drainage and erosion controls will be inspected throughout the post-closure period to promote surface water conveyance away from the landfill and to the perimeter drainage system. Items or conditions to be examined include the following:

- Erosion/ Settlement
- Structural integrity of berms, letdown structures, and other drainage and erosion control structures
- Silt and sediment buildup

Maintenance and repairs should be conducted as soon as practical, and may consist of the following activities:

- Replacement of riprap, gabions, or other structural lining installed for erosion protection
- Removal of obstructions to permit conveyance of surface water

- Placement of fill and re-grading
- Removal of silt and sediment
- Repair to berms
- Repair or replacement of stacked hay bales or silt fencing

8.1.4 Leachate Collection System

Post-closure care of the leachate collection system consists of the operation and maintenance of the leachate collection system, as well as any storage, pumping, or conveyance systems. As required per OAC 252:515-25-54(b)(2)(B), the leachate collection system will be equipped with a system for automatic and continuous leachate removal not requiring intervention by the owner/operator.

The leachate collection system will be observed during each scheduled inspection event throughout the post-closure period. Based on the results of the inspections, more frequent or less frequent monitoring may be required due to problems with the system or changes in the rate of production of leachate. During these inspections, leachate collection sumps and/or piping, cleanouts, or inspection points will be observed to determine the effectiveness of the system in removing leachate and minimizing the head on the liner system.

Maintenance, on an annual or otherwise as-needed basis, may include flushing and pressure cleaning of the leachate collection and removal pipes.

8.1.5 Groundwater Monitoring System

Semi-annual groundwater monitoring of the monitoring network wells will be completed in accordance with the most recently approved groundwater monitoring plan.

8.1.6 Surface Water Monitoring Program

During site inspections, surface water control structures (drainage swales, letdown channels, perimeter channels, culverts, and detention ponds) will be inspected to facilitate proper operation. Any problems noted during the inspection will be addressed as soon as reasonably possible.

8.1.7 Landfill Gas Monitoring System

Monitoring of explosive gas monitoring wells located along the site boundary will be conducted on a semi-annual basis during the post-closure period as outlined in the most recently approved explosive gas monitoring plan.

8.1.8 Site Security and Access Control

Post-closure care of the security system is necessary to control unauthorized access and prevent illegal dumping of waste. Inspection of the security system at the site should be performed during the post-closure inspections. Signs shall be posted on the outer perimeter indicating the site is a closed MSWLF, as required by OAC 252:515-25-54(a)(1). The closed facility will be maintained as necessary to provide access to the closed areas throughout the post-closure period.

9.0 POST-CLOSURE COST ESTIMATE

A cost estimate for post-closure care of the landfill, including costs for the activities described above, is provided in Appendix A. This estimate includes the following costs:

- Quarterly site inspection
- Site security and access control
- Final cover erosion and seeding repair
- Semi-annual groundwater monitoring
- Surface water control structure maintenance
- Semi-annual explosive gas monitoring
- Leachate collection, disposal, and system maintenance
- Annual reporting
- Certification and recordkeeping

Post-closure estimates and the amount of FA provided must be increased if, at any time during the active life, changes to the closure plan of the facility increase the maximum cost of post-closure. Proposals for reduction of post-closure cost estimates and the amount of FA required must be submitted to the ODEQ for approval. To qualify for a reduction, the cost estimate must be demonstrated to exceed the minimum cost of post-closure during the remaining post-closure care period, the amount of security remaining after the reduction must adequately cover the estimated post-closure cost yet to be performed, and FA shall not be reduced until ODEQ approval has been granted.

At a minimum, cost estimates for post-closure shall be adjusted no later than April 9th of each year; the adjustment must be submitted to the ODEQ for approval. In the adjustment, maximum costs of post-closure may be recalculated, in current dollars, in accordance with OAC 252:515-27-51. If there are no significant changes to the post-closure plan, the cost estimate may be adjusted by use of an inflation factor. The inflation factor can be derived from the most recent annual Implicit Price Deflator for Gross National Product or the Implicit Price Deflator for Gross Domestic Product published by the U.S. Department of Commerce in its Survey of Current Business in a year for which the adjustment is made. The approved adjusted cost estimate shall be placed in the operating record.

If corrective action is required at AEL, cost estimates for corrective action shall be submitted to the ODEQ for approval. The cost estimates shall be a detailed written estimate, in current dollars, of the cost of hiring a third party to perform the corrective action in accordance with an approved corrective action plan. The corrective action cost estimate shall be set by the ODEQ and account for the total costs of corrective action activities as described in an approved corrective action plan for the entire corrective action period. The amount of FA provided must be increased to account for corrective action costs.

10.0 FINANCIAL ASSURANCE INSTRUMENT

At a minimum, the financial assurance instrument (FAI) shall be updated no later than April 9 of each year. Updates will address modifications to the landfill's closure and post-closure requirements, if any, and the associated cost estimates. If there are no significant changes to the post-closure plan, the cost estimate may be adjusted by use of an inflation factor. The inflation factor can be derived from the most recent annual Implicit Price Deflator for Gross National Product or the Implicit Price Deflator for Gross Domestic Product published by the U.S. Department of Commerce in its Survey of Current Business in a year for which the adjustment is made. The current FAI shall be placed in the operating record.

In effect of non-renewal of, or failure to maintain or provide FA, the ODEQ shall begin proceedings to summarily suspend or revoke the permit for failure to establish FA in accordance with OAC 252:515-27, renew or maintain an approved FA mechanism, or provide acceptable substitute FA when necessary. Substitute FA may be provided as specified in OAC 252:515-27.

10.1 PERMIT TRANSFER

When the permit is transferred from one owner/operator to another owner/operator, the transferee shall either provide a new FA or assume the existing assurance, so long as the existing assurance is adequate in amount.

11.0 FINANCIAL ASSURANCE MECHANISM

To qualify as FA for the performance costs of closure, post-closure, and/or corrective action, a FA mechanism must meet the following criteria:

- Ensure that the amount of funds assured is sufficient to cover the costs of closure, post-closure care, and/or corrective action for known releases when needed
- Ensure that funds will be available in a timely fashion when needed
- Legally valid, binding, and enforceable under State and Federal law
- Non-negotiable
- Amount approved by the ODEQ
- Indicate the purpose of the FA is to provide funds for the adequate completion of closure, post-closure, and/or corrective action upon the failure of the owner/operator to fully complete performance according to the terms of the permit and applicable law
- Provide the name, address, telephone number(s), contact person(s), and organizational information for the principal and for the FA issuer
- Provide information on the financial responsibility and liability limits of the issuer
- Provide a clause requiring payment to the State of Oklahoma, Department of Environmental Quality Revolving Fund, as the sole beneficiary upon the DEQ's certification that the principal has not fully or satisfactorily performed required closure, post-closure, and/or corrective action activities
- Provide a clause addressing termination and stating that neither the principal nor issuer can revoke or cancel the FA mechanism without notice to the ODEQ 120 days before revocation or cancellation is effective
- Provide a clause requiring notice to the ODEQ by the issuer and to the principal prior to the renewal date, if any
- Provide a clause requiring 30-day notice to the ODEQ by the issuer of principal's failure to pay renewal fee(s), if any
- Specify whether coverage is for the life of the facility through certified closure, the period of post-closure care required by law, and/or corrective action
- Include original signatures and typed names of authorized agents of the principal and the issuer
- Contain evidence that the signatory for the issuer is empowered to commit the issuer to payment.

The owner/operator must choose either cash, certificate of deposit, trust fund, escrow account, surety bond, letter of credit, insurance, corporate financial test, local government financial test, corporate guarantee, local government guarantee, or any other State approved mechanism pursuant OAC 252:27 74 – 85 so long as the FA mechanism criteria specified in OAC 252:515-27-71 are meet and is approved by the ODEQ.

11.1 USE OF MULTIPLE MECHANISMS

FA requirements may be satisfied by establishing more than one approved FA mechanism so long as the amount of FA for all mechanisms is at least the current cost estimate for closure, post-closure care and/or corrective action. Mechanisms guaranteeing performance rather than payment may not be combined with other mechanisms. The financial test or a guarantee may not be combined with other mechanisms if the financial statements of the firms are consolidated.

12.0 POST-CLOSURE LAND USE

There are no current planned uses for AEL after closure. Should the use of the closed landfill not associated with solid waste activities be considered, plans will be prepared and submitted to the ODEQ for review and approval per OAC 252:515-25-55.

13.0 POST-CLOSURE REPORTING REQUIREMENTS

13.1 ANNUAL POST-CLOSURE REPORT

Beginning one year after ODEQ's approval of the certification of final closure, AEL will submit an annual post-closure maintenance and monitoring report to the ODEQ until the post-closure period ends. This report will document the maintenance performed at the site and summarize all monitoring data for the previous year. The report shall be submitted by April 1st of each year after ODEQ's certification of final closure.

13.2 CERTIFICATION OF POST-CLOSURE PERFORMANCE

At the conclusion of the post-closure period, AEL will submit, in lieu of the annual post-closure report, a certification prepared and sealed by a professional engineer registered in the State of Oklahoma certification, indicating that the MSWLF was maintained and monitored in accordance with the approved post-closure plan, the permit, and applicable regulations. This certification will also indicate whether monitoring throughout the post-closure period has shown the presence of elevated levels of any constituent or if any evidence of contamination related to site operations has been found and, if so, what corrective measures were taken. The certification will be maintained in the site operating record.

Appendix A

Closure and Post-Closure Cost Estimates

Table H.1 2024 Site Data

Facility Name: American Environmental Landfill, Inc

Permit Number: 3557021

Description	Quantity	Units
Total Permitted Area	173.71	acres
Active Portion		
Composite Lined	77.90	acres
Soil Lined	0.00	acres
Area of Largest Cell/Phase Requiring Final Cap		
Composite Lined	77.90	acres
Soil Lined	0.00	acres
Perimeter Fencing	19,993.0	linear feet
Groundwater Monitoring Wells	817.8	VLF
Methane Gas Probes	2,285.3	VLF
Terraces	1,720.0	linear feet
Letdown Channels	82.0	linear feet
Perimeter Drainage Ditches	1,168.0	linear feet
Average Daily Waste Flow	2,233.1	tons/day
Landfill Disposal Cost	$36.00	$/ton

VLF = Vertical Linear Feet. The sum of the depths of all monitoring wells.
Average Daily Waste Flow based on 2023 waste receipts and 307 operating days.

Table H.2 2024 Closure Cost Estimate
Facility Name: American Environmental Landfill, Inc.
Permit Number: 3557021

	Task/Service	Quantity	Units	Multiplier	Unit Cost	Subtotal
1	**PRELIMINARY SITE WORK**					
1.1	Conduct Site Evaluation	1.0	Lump Sum	1	$4,376.08	$4,376.08
1.2	Dispose Final Waste					
	Average Daily Flow	2,233.1	tons/day			
	Disposal Cost	2,233.1	tons/day	5	$36.00	$401,952.43
1.3	Remove Temporary Building(s)	0.0	Lump Sum	1	$4,012.89	$0.00
1.4	Remove Equipment	1.0	Lump Sum	1	$3,275.69	$3,275.69
1.5	Repair/Replace Perimeter Fencing	19,993.0	Linear Feet	0.25	$4.29	$21,442.49
1.6	Clean Leachate Line(s)	1.0	Lump Sum	1	$1,982.05	$1,982.05
2	**MONITORING EQUIPMENT**					
2.1	Rework/Replace Monitoring Well(s)	817.8	VLF	0.25	$92.01	$18,810.52
2.2	Plug Abandoned Monitoring Well(s)	817.8	VLF	0.25	$36.83	$7,529.53
2.3	Rework/Replace Methane Probe(s)	2,285.3	VLF	0.25	$79.47	$45,402.20
2.4	Plug Abandoned Methane Probe(s)	2,285.3	VLF	0.25	$29.04	$16,590.92
2.5	Rework/Replace Remediation and/or Gas Control System	1.0	Lump Sum	0.05	$832,000.00	$41,600.00
3	**CONSTRUCTION**					
3.1	Complete Site Grading, Including Borrow Area	87.90	Acres	1	$1,735.01	$152,507.38
3.2	Construct Final Cap					
	Compacted On-Site Clay Cap or	377,036.0	Cubic Yards	1	$6.23	$2,348,934.28
	Compacted Off-Site Clay Cap or		Cubic Yards	1	$10.13	$0.00
	Install Geosynthetic Clay Liner Cap		Square Feet	1	$0.65	$0.00
3.3	Construct Landfill Gas Venting Layer					
	Place Sand or		Acres	1	$46,392.25	$0.00
	Install Net and Geotextile		Square Feet	1	$0.46	$0.00
3.4	Install Passive Landfill Gas Vents		Acres	1	$1,111.39	$0.00

Table H.2 2024 Closure Cost Estimate
Facility Name: American Environmental Landfill, Inc.
Permit Number: 3557021

	Task/Service	Quantity	Units	Multiplier	Unit Cost	Subtotal
3.5	Install Flexible Membrane Liner		Square Feet	1	$0.51	$0.00
3.6	Drainage layer					
	Place Sand or		Acres	1	$46,392.25	$0.00
	Install Net and Geonet		Square Feet	1	$0.46	$0.00
3.7	Place On-Site Topsoil	125,678.7	Cubic Yards	1	$2.68	$336,818.83
	Place Off-Site Topsoil		Cubic Yards	1	$21.44	$0.00
3.8	Establish Vegetative Cover, Including On- and Off-Site Borrow Areas	87.90	Acres	1	$1,236.49	$108,687.47
4	**DRAINAGE/EROSION CONTROL**					
4.1	Construct Terraces	1,720.0	Linear Feet	1	$11.23	$19,315.60
4.2	Construct Letdown Channels	82.0	Linear Feet	1	$122.82	$10,071.24
4.3	Clean Perimeter Drainage Ditches	1,168.0	Linear Feet	0.5	$8.56	$4,999.04
5	**TASK NOT**					
6	**SUBTOTAL**					$3,544,295.75
7	**ADMINISTRATIVE SERVICES**	1.0	Lump Sum	0.10	$3,544,295.75	$354,429.57
8	**TECHNICAL and PROFESSIONAL SERVICES**	1.0	Lump Sum	0.12	$3,544,295.75	$425,315.49
9	**CLOSURE CONTINGENCY**	1.0	Lump Sum	0.10	$3,544,295.75	$354,429.57
10	**TOTAL FINAL CLOSURE**					$4,678,470.39

Table I.1 2024 Post-Closure Cost Estimate
Facility Name: American Environmental Landfill, Inc.
Permit Number: 3557021

	Task/Service	Quantity	Units	Multiplier	Unit Cost	Subtotal
1	**SITE MAINTENANCE**					
1.1	Site Inspections	4.0	Per Year	30	$796.06	$95,527.20
1.2	General Maintenance	1.0	Per Year	30	$2,386.63	$71,598.90
1.3	Remediation and/or Gas Control Equipment	1.0	Lump Sum	0.3	$832,000.00	$249,600.00
2	**MONITORING EQUIPMENT**					
2.1	Rework/Replace Monitoring Well(s)	817.8	VLF	0.25	$92.01	$18,810.52
2.2	Plug Abandoned Monitoring Well(s)	817.8	VLF	0.25	$36.83	$7,529.53
2.3	Final Plugging of Monitoring Well(s)	817.8	VLF	1	$36.83	$30,118.10
2.4	Rework/Replace Methane Probe(s)	2,285.3	VLF	0.25	$79.47	$45,402.20
2.5	Plug Abandoned Methane Probe(s)	2,285.3	VLF	0.25	$29.04	$16,590.92
2.6	Final Plugging of Methane Probe(s)	2,285.3	VLF	1	$29.04	$66,363.66
2.7	Final Plugging of Piezometer(s)	166.9	VLF	1	$29.04	$4,847.94
3	**SAMPLING and ANALYSIS**					
3.1	Groundwater Monitoring Wells	13.0	Wells	60	$858.38	$669,536.40
3.2	Methane Gas Probes	32.0	Probes	60	$55.71	$106,963.20
3.3	Surface Water Monitoring Points	0.0	Points	60	$103.44	$0.00
3.4	Leachate	1.0	Sample	60	$166.69	$10,001.40
4	**FINAL COVER MAINTENANCE**					
4.1	Mow and Fertilize Vegetative Cover	129.29	Acres	30	$263.35	$1,021,455.65
4.2	Repair Erosion, Settlement, and Subsidence for On-Site Soils	129.29	Acres	60	$3.82	$29,633.27
	Repair Erosion, Settlement, and Subsidence for Off-Site Soils	0.0	Acres	30	$22.84	$0.00
4.3	Re-Seed Vegetative Cover	129.29	Acres	0.2	$1,236.49	$31,973.16

Table I.1 2024 Post-Closure Cost Estimate
Facility Name: American Environmental Landfill, Inc.
Permit Number: 3557021

	Task/Service	Quantity	Units	Multiplier	Unit Cost	Subtotal
5	**Leachate Management**					
5.1	Clean Leachate Line(s)	1.0	Lump Sum	30	$2,041.31	$61,239.30
5.2	Maintain Leachate Collection System and Equipment	1.0	Lump Sum	30	$3,171.26	$95,137.80
5.3	Collect, Treat, Transport, and Dispose Leachate	0.0	Gallons/Year	30	$0.40	$0.00
6	**TASK NOT**					
7	**SUBTOTAL**					$2,632,329.14
8	**ADMINISTRATIVE SERVICES**	1.0	Lump Sum	0.06	$2,632,329.14	$157,939.75
9	**TECHNICAL and PROFESSIONAL SERVICES**	1.0	Lump Sum	0.07	$2,632,329.14	$184,263.04
10	**POST-CLOSURE CONTINGENCY**	1.0	Lump Sum	0.10	$2,632,329.14	$263,232.91
11	**TOTAL POST CLOSURE**					$3,237,764.84

Appendix B

Right of Access Documentation

Toby Bighorse - Osage County Clerk
Recorded/Filed on 05/31/2002 at 11:47AM Inst Type: WD
DOC: 2002-4864 Book 1090 Page 808 to 808 (1 pages)
Receipt Number: 2002-00004118 Fees: $8.00
DOC Stamps: $1549.50

GENERAL WARRANTY DEED

Ref. 800
Doc. 1,549.50

KNOW ALL MEN BY THESE PRENSENTS: That

FORREST E. BURNS, JR. and IDA BURNS, husband and wife ("Grantor"), in consideration of the sum of TEN AND NO/100 DOLLARS ($10.00) and other good and valuable consideration, the receipt and suffiency of which are hereby acknowledged, do hereby grant, bargin, sell and convey unto AMERICAN ENVIRONMENTAL LANDFILL, INC. ("Grantee") **ADDRESS:** 1430 W. 35th St. Tulsa, OK 74107, a certain tract of real property situated in Osage County, Oklahoma, described as follows, to wit:

NE/4 SE/4 and E/2 NW/4 SE/4 and NW/4 NW/4 SE/4 and the South 50' of the East 1,165.11 feet of the SE/4 NE/4, Section 36, T20N, R10E, Osage County Oklahoma,

together with all the improvements thereon and appurtenances thereunto belonging, LESS AND EXCEPT the reservation of the oil gas, coal and other minerals to the Osage Tribe of Indians created by Act of Congress, June 28, 1906 (34 Stat. L. 539) and Acts amendatory thereof and supplementary thereto; and SUBJECT TO all easements, rights-of-way, retrictive covenants, building restrictions of record, ordinances, and special assessments not yet due, and warrants, the title to the same.

Douglas Boyd
1717 E 15th St.
Tulsa, OK 74104

TO HAVE AND TO HOLD said described premises unto the Grantee, Grantee's successors and assigns forever free, clear and discharged of and from all former grants, claims charges, taxes judgments, mortgages and other liens and encumbrances whatsoever, EXCEPT FOR and SUBJECT TO those mattes set forth hereinabove. PROVIDED that Ida Burns joins in the execution of this deed only for the purpose of disclaiming any homestead rights which she might have in the property being conveyed. She claims no ownership in said property nor makes any warranties in regard thereto.

EXECUTED and delivered this 29th day of ~~March~~ May, 2002.

Forrest E. Burns Jr.
FORREST E. BURNS, JR.,

Ida B Burns
IDA BURNS

STATE OF OKLAHOMA
OSAGE COUNTY
DOC. STAMPS $ 1,549.50

BK 1090 PG 0808
004864

STATE OF OKLAHOMA, OSAGE COUNTY, ss:

The foregoing deed was acknowledged before me this 29th day of ~~March~~ May, 2002, by Forrest E. Burns, Jr. and Ida Burns, husband and wife.

Jane Kibble
Notary Public

OFFICAL SEAL:

My commission expires: July 29, 2004
12002

Oklahoma
OFFICIAL SEAL
JANE KIBBLE
Tulsa County

I-2005-006539 07/27/2005 11 50 am
Book 1233 Page(s) 0737-0737
Fee: $ 13.00 Doc: $ 1,533 75
Denny Hutson - Osage County Clerk
State of Oklahoma

GENERAL WARRANTY DEED

THIS INDENTURE, Made this 12th day of August, 2003 between Forrest E. Burns, Jr., Grantor, and American Environmental Landfill, Inc., Grantee.

WITNESSETH, That in consideration of the sum of Ten Dollars ($10.00), the receipt of which is hereby acknowledged, Grantor by these presents, does grant, bargain, sell and convey unto Grantee, its successors and assigns, all of the following described real estate, situated in the County of Osage, State of Oklahoma, to-wit:

06539

BK 1233 PG 0737

SURFACE OF

Lots 3 and 4 and the N/2 SW/4 and S/2 S/2 NW/4 and an approximate 3 acre tract being the North 198 feet of the SW/4 NW/4 SE/4 all in Section 36, Township 20 North, Range 10 East Osage County, Oklahoma, LESS AND EXCEPT a tract of land being a part of the S/2 S/2 NW/4, Section 36, being more particularly described as commencing at the SE corner of said NW/4, thence North 00°06'30" West along the East line of said NW/4 a distance of 674.92 feet; thence South 88°42'49" West along the North line of the S/2 of the S/2 of the NW/4 a distance of 921.97 feet to the point of beginning; thence South 01°01'16" East a distance of 608.04 feet; thence South 88°58'44" West and parallel to the South line of said NW/4 a distance of 400 feet; thence North 01°01'16" East a distance of 606.18 feet to a point on the North line of the S/2 of the S/2 of said NW/4; thence North 88°42'49" East along the North line of the S/2 of the S/2 of said NW/4 a distance 400 feet to the point of beginning, said tract of land containing 5.575 acres more or less,

and

The E/2 SE/4 NE/4 and E/2 NE/4 SE/4 and Lot 3, Section 35, Township 20 North, Range 10 East, Osage County, Oklahoma.

TO HAVE AND TO HOLD THE SAME, together with all and singular the tenements, hereditaments and appurtenances, thereto belonging, or in any wise appertaining forever.

And said Grantor, his heirs, executors, administrators and successors do hereby covenant, promise and agree to and with said party Grantee at delivery of these presents that he is lawfully seized in his own right of an absolute and indefeasible estate of inheritance in fee simple, of and in all singular the above granted and described premises, with appurtenances; that the same are free, clear, and discharged and unencumbered of and from all former and other grants, titles, charges, states, judgments, taxes, assessments and encumbrances, of whatsoever nature and kind, EXCEPT: easements and building restrictions of record and that said Grantor will WARRANT AND FOREVER DEFEND the same unto the said Grantee, its successors and assigns, against said Grantor, its heirs or assigns and all and every person or persons whomsoever lawfully claiming or to claim the same.

IN WITNESS WHEREOF, The said Grantor has caused these presents to be signed the day first above written.

Forrest E. Burns Jr.
FORREST E. BURNS, JR.

STATE OF OKLAHOMA)
) ss
COUNTY OF TULSA)

STATE OF OKLAHOMA
OSAGE COUNTY
DOC. STAMPS $ 1533.75

ACKNOWLEDGMENT

This instrument was acknowledged before me this 12 day of August 2003, by Forrest E. Burns, Jr.

Susan J. Bundy
Notary Public
Commission No. 03002703

My Commission Expires: 6-2-07

SUSAN J. BUNDY
NOTARY PUBLIC
IN AND FOR
STATE OF OKLAHOMA
TULSA COUNTY

NOT AN OFFICIAL COPY

I-2018-003789 06/06/2018 8:59 am
Book 1686 Page(s) 0857-0860
Fee $ 19.00 Doc $ 4,997.25
Sheila Bellamy - Osage County Clerk
State of Oklahoma

Tax information sent to:
1420 W. 35th St.
Tulsa, Ok 74107

Documentary Stamps: $4,997.25

TRUSTEE'S DEED

(4)
14.00
5.00
4997.25
by
CW

KNOW ALL PERSONS BY THESE PRESENTS:

That Central National Bank & Trust Company of Enid, Oklahoma, Successor Trustee of The Forrest E. Burns, Jr. Revocable Trust, dated January 23, 2003 ("Grantor"), in consideration of the sum of TEN AND NO/100 DOLLARS ($10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, does hereby grant, bargain, sell and convey unto American Environmental Landfill, Inc., an Oklahoma corporation (the "Grantee), all interest in and to the real property situated in Osage County, State of Oklahoma, and more particularly described as follows, to-wit:

(See Exhibit "A" attached hereto and made a part hereof)

TO HAVE AND TO HOLD said described premises unto the Grantee, and Grantee's heirs, successors and assigns forever, free, clear and discharged of and from all former grants, claims, charges, taxes, judgments, mortgages and other liens and encumbrances whatsoever, except easements and restrictions of record.

This conveyance is made without warranty, express or implied, but there is, however, assigned unto Grantee all of the right, title and interest of Grantor in and to any and all warranties and covenants of or concerning title heretofore made by any person or other legal entity with respect to the above described real estate, and Grantee shall have the same rights with respect to such warranties and covenant and the enforcement thereof as Grantor now has.

Executed and delivered this 1st day of June, 2018.

Central National Bank & Trust Company of Enid, Oklahoma, Successor Trustee of The Forrest E. Burns, Jr. Revocable Trust, dated January 23, 2003

By: _____
R. Patrick Anderson, Senior Vice President and Trust Officer

VIEW ADDITIONAL LAND RECORDS AT OKCOUNTYRECORDS.COM

STATE OF OKLAHOMA
OSAGE COUNTY
DOC. STAMPS $ 4997.25

Guaranty Abstract Company
P.O. Box 3048
Tulsa, Oklahoma 74101

Filed by Guaranty Abstract Company
and return to Janel / carla Hall

003789 BK 1686 PG 0857

NOT AN OFFICIAL COPY

STATE OF OKLAHOMA)
) ss.
COUNTY OF TULSA)

This instrument was acknowledged before me this 1 day June, 2018 by R. Patrick Anderson, as Senior Vice President and Trust Officer of Central National Bank & Trust Company of Enid, Oklahoma, as Successor Trustee of The Forrest E. Burns, Jr. Revocable Trust, dated January 23, 2003.

Notary Public

My commission expires:
11/12/21
Commission # 01016821
(Seal)

CARLA J. HALL NOTARY PUBLIC STATE OF OKLAHOMA TULSA COUNTY

BK 1686 PG 0858

VIEW ADDITIONAL LAND RECORDS AT
OKCOUNTYRECORDS.COM

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Exhibit "A"
Legal Description

The North Half of the Northeast Quarter (N/2 NE/4) of Section Thirty-five (35), Township Twenty (20) North, Range Ten (10) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

Lots One (1), Two (2), Three (3), Four (4), Five (5), Six (6), Seven (7), Eight (8), Nine (9), Ten (10), Eleven (11), Twelve (12), Thirteen (13), Fourteen (14), Fifteen (15), Sixteen (16), Seventeen (17), Eighteen (18), Nineteen (19), Twenty (20), Twenty-one (21), Twenty-two (22), Twenty-three (23), Twenty-four (24), Twenty-five (25) and Twenty-six (26), Block One (1), CANVILLE ADDITION to Osage County, State of Oklahoma, according to the recorded Plat thereof.

Lot Two (2) (SW/4 NW/4) and Lot Three (3) (NW/4 SW/4) of Section Thirty-one (31), Township Twenty (20) North, Range Eleven (11) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

The North Half of the South Half of the Northwest Quarter (N/2 S/2 NW/4) of Section Thirty-six (36), Township Twenty (20) North, Range Ten (10) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

The North Half of the Northwest Quarter (N/2 NW/4) of Section Thirty-six (36), Township Twenty (20) North, Range Ten (10) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

Lot One (1) (SE/4 SE/4) and Two (2) (SW/4 SE/4);
AND the North Half of the Southeast Quarter (N/2 SE/4), LESS AND EXCEPT the East Half of the Northeast Quarter of the Southeast Quarter (E/2 NE/4 SE/4);
AND the South Half of the Northeast Quarter (S/2 NE/4), LESS AND EXCEPT the East Half of the Southeast Quarter of the Northeast Quarter (E/2 SE/4 NE/4);
AND the Northeast Quarter of the Southwest Quarter (NE/4 SW/4), LESS AND EXCEPT, the West 900 feet of the North 1,200 feet thereof AND LESS AND EXCEPT the West 740 feet of the remainder of the NE/4 SW/4;
All in Section Thirty-five (35), Township Twenty (20) North, Range Ten (10) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

OKLAHOMALANDRECORDS.COM

BK 1686PG0859

The East Half of the Northwest Quarter (E/2 NW/4) of Section Thirty-five (35), Township Twenty (20) North, Range Ten (10) East of the Indian Base and Meridian, Osage County, State of Oklahoma, according to the United States Government Survey thereof.

NOT AN OFFICIAL COPY

VIEW ADDITIONAL LAND RECORDS AT
OKCOUNTYRECORDS.COM

TEMPORARY EASEMENT FOR ACCESS

Pursuant to the Oklahoma Environmental Quality Code (27A O.S. §2-1-101 *et seq.*, including the Solid Waste Management Act, the rules promulgated thereunder, and in accordance with the conditions and requirements of Permit No. 3557021, issued by the Oklahoma State Department of Health, the predecessor in interest to the Oklahoma Department of Environmental Quality (DEQ) on May 31, 2024, Kenny Burkett, (his/her heirs and assigns) (its successors and assigns), hereinafter referred to as Grantor, does hereby grant unto the DEQ, including its contractors, employees, and its successors and assigns, the right of access for purposes of performing closure, post-closure monitoring, or corrective action in the event of default by the owner or operator. The Easement is granted over and across the following described land, situated in Osage County, State of Oklahoma:

Tract 1 (the permitted area): As described on attached, more particularly described as the permitted area of American Environmental Landfill, Oklahoma Department of Environmental Quality Permit Number 3557021.

This Temporary Easement for Access is given subject to the following conditions:

1. The Grantor hereby grants unto the DEQ an easement and right-of-way over and across Tract 1, above set out, for access to said Tract 1 for the purposes of conducting closure and post-closure activities and/or corrective action as prescribed by the laws of the State of Oklahoma and Rules of the DEQ;

2. This Easement is temporary and shall become null and void upon certification by the DEQ that post-closure and/or corrective action has been properly completed.

This Easement shall be binding upon the heirs, successors and assigns of the parties hereto.

IN WITNESS WHEREOF, the Grantor has hereunto set (his/her/its) hand this 21st day of MAY, 2024.

Kenny Burkett, Owner

American Environmental Landfill, Inc. Legal Description:

The Northeast Quarter (NE/4) of the Southeast Quarter (SE/4) and the East Half (E/2) of the Northwest Quarter (NW/4) of the Southeast Quarter (SE/4) and the Northwest Quarter (NW/4) of the Northwest Quarter (NW/4) of the Southeast Quarter (SE/4) of Section 36, Township 20 North, Range 10 East of the Indian Meridian, Osage County, Oklahoma.

AND

A tract of land being a part of the West Half (W/2) of Section 36 and the East Half (E/2) of Section 35, Township 20 North, Range 10 East of the Indian Meridian, Osage County, Oklahoma and being more particularly described as follows:

BEGINNING at the Southwest corner of said Section 36;

Thence North 01°10'20" East along the West line of said Section 36, a distance of 354.62 feet to the Southwest corner of the North Half (N/2) of the Southwest Quarter (SW/4) of said Section 36;

Thence South 89°15'49" West along the South line of the East Half (E/2) of the Northeast Quarter (NE/4) of the Southeast Quarter (SE/4) of said Section 35, a distance of 320.25 feet;

Thence North 01°03'24" West, a distance of 1413.21 feet;

Thence North 88°56'36" East, a distance of 273.38 feet;

Thence North 00°03'14" East parallel to and 100.00 feet West of the East line of the Northeast Quarter (NE/4) of said Section 35, a distance of 564.60 feet;

Thence North 88°42'49" East a distance of 100.03 feet to the Northwest corner of the South Half (S/2) of the South Half (S/2) of the Northwest Quarter (NW/4) of said Section 36;

Thence continuing North 88°42'49" East along the North line of the South Half (S/2) of the South Half (S/2) of the Northwest Quarter (NW/4) of said Section 36, a distance of 1318.42 feet;

Thence South 01°01'16" East, a distance of 606.18 feet;

Thence North 88°58'44" East, a distance of 400.00 feet;

Thence North 01°01'16" West, a distance of 608.04 feet to a point on the North line of the South Half (S/2) of the South Half (S/2) of the Northwest Quarter (NW/4) of said Section 36;

Thence North 88º42'49" East along the North line of the South Half (S/2) of the South Half (S/2) of the Northwest Quarter (NW/4) of said Section 36, a distance of 921.97 feet to the Northeast corner of the South Half (S/2) of the South Half (S/2) of the Northwest Quarter (NW/4) of said Section 36;

Thence South 00º06'30" East along the East line of the West Half (W/2) of said Section 36, a distance of 2360.46 feet to the Southeast corner of the Southwest Quarter (SW/4) of said Section 36;

Thence South 89º16'14" West along the South line of the Southwest Quarter (SW/4) of said Section 36, a distance of 2679.26 feet to the POINT OF BEGINNING.

Said tract of land contains 150.09 acres, more or less.

AND

The South 50.00 feet of the East 1165.11 feet of the Southeast Quarter (SE/4) of the Northeast Quarter (NE/4) of Section 36, Township 20 North, Range 10 East of the Indian Meridian, Osage County, Oklahoma.

Said tract of land contains 1.34 acres, more or less.

AND

A Tract of land in the East Half (E/2) of Section Thirty-five (35) and the West Half of the West Half (W/2 W/2) of Section Thirty-six (36), Township Twenty (20) North, Range Ten (10) East of the Indian Meridian, Osage County, Oklahoma and being more particularly described as follows:

BEGINNING at the Southeast Corner of said Section 35;

Thence S89°51'44"W on the South Line of said Section 35 a distance of 2,624.40 feet to the Southwest Corner of said E/2;

Thence N0°10'55"E on the West Line of said E/2 a distance of 2,083.00 feet;

Thence N44°26'58"E a distance of 1,254.02 feet to a point on the South Line of the North Half of the Northeast Quarter (N/2 NE/4) of said Section 35;

Thence N16°00'28"E a distance of 330.70 feet;

Thence N88°51'08"E parallel with the North Line of said E/2 a distance of 1684.00 feet to a point on the East Line of said Section 35;

Thence N87°55'47"E parallel with the North Line of said W/2 W/2 of Section 36 a distance of 1319.51 feet to a point on the East Line of said W/2 W/2;

Thence S0°03'02"E on the East Line of said W/2 W/2 a distance of 1006.10 feet to the Southeast Corner of the North Half of the Southwest Quarter of the Northwest Quarter (N/2 SW/4 NW/4) of said Section 36;

Thence S88°42'53"W on the South Line of said N/2 SW/4 NW/4 a distance of 1.84 feet to a Chiseled Cross found for a corner of the existing Permit Boundary (also the Northwest Corner of the tract known as the Cemetery, as described in JOURNAL ENTRY OF JUDGEMENT, Recorded in Book 1429 @ Page 693);

Thence continuing S88°42'53"W on the existing Permit Boundary and on the South Line of said N/2 SW/4 NW/4 a distance of 1318.20 feet to the Southwest Corner of said N/2 SW/4 NW/4;

Thence continuing S88°42'53"W on the existing Permit Boundary, entering said Section 35, a distance of 100.03 feet;

Thence S0°00'35"W on the existing Permit Boundary, parallel with the East Line of said Section 35 a distance of 564.60 feet;

Thence S88°57'36"W on the existing Permit Boundary a distance of 273.49 feet;

Thence S1°02'24"E on the existing Permit Boundary a distance of 1413.79 feet to a point on the South Line of the Northeast Quarter of the Southeast Quarter (NE/4 SE/4) of said Section 35;

Thence N89°12'15"E on the existing Permit Boundary and on the South Line of said NE/4 SE/4 a distance of 320.25 feet to the Southeast Corner of said NE/4 SE/4;

Thence S1°11'51"W on the existing Permit Boundary and on the East Line of said Section 35 a distance of 354.62 feet to the POINT OF BEGINNING, containing 202.5 acres more or less.

ACKNOWLEDGMENT

STATE OF OKLAHOMA)
) SS:
COUNTY OF Tulsa)

Before me, the undersigned, a Notary Public within and for said County and State, on this 21st day of May, 2024, personally appeared Kenny Burkett, to me known to be the identical person who executed the within and foregoing instrument, and acknowledged to me that (he/she) executed the same as (his/her) free and voluntary act and deed, for the uses and purposes therein set forth.

Witness my hand and official seal the date above written.

SARAH ABBOTT
Notary Public in and for
STATE OF OKLAHOMA
Commission #21004956
Expires: 12 Apr 2025

Sarah Abbott
Notary Public

My commission expires:

April 12, 2025

Appendix L

Quality Assurance/Quality Control Plan for Evapotranspiration Alternative Earthen Final Cover Construction

Appendix M

Leachate Recirculation Plan

Leachate Recirculation Plan

American Environmental Landfill

American Environmental Landfill, Inc.
207 North 177th West Avenue
Sand Springs, Oklahoma 74063

SCS ENGINEERS

27220345.00 | February 2025

8575 W. 110th Street, Suite 100
Overland Park, KS 66210
913-681-0030

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CERTIFICATION

This report has been prepared for exclusive use by American Environmental Landfill, Inc. for the American Environmental Landfill (AEL) for specific application to the project discussed, and it has been prepared in accordance with good engineering practices including consideration of industry standards and the requirements of the Oklahoma Department of Environmental Quality.

Prepared by:

Floyd Cotter, PE
SCS Engineers

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1.0 INTRODUCTION

The American Environmental Landfill (AEL) is located near Sand Springs, Oklahoma in Sections 35 and 36, Township 20 North, Range 10 East, in Osage County, Oklahoma. The project site is on the Wekiwa Oklahoma 7.5 Minute USGS Quadrangle map and operates under the Oklahoma Department of Environmental Quality (ODEQ) Permit Number 3557021.

The AEL has an existing Leachate Recirculation Plan (LRP) dated August 16, 2007, approved by the ODEQ on August 27, 2007, that includes leachate recirculation over composite lined areas of Phases III and V. In accordance with OAC 252:515-13-53, AEL proposes to add leachate recirculation within constructed areas of Phase IV and the lateral expansion area. The following LRP details leachate recirculation activities at the permitted facility. Leachate recirculation activities will be conducted only over areas with a composite liner and leachate collection system such that all leachate remains on the composite lined cell. Leachate recirculation will occur within constructed portions of the AEL where a composite liner and leachate collection system is installed and include Phases III, IV, V, and the lateral expansion area.

2.0 HELP MODEL ANALYSIS

The purpose of this analysis is to demonstrate that with the recirculation of leachate into the landfill, consistent with OAC 252:515-13-31, the leachate collection systems will maintain less than 12 inches of head on the liner in all cases.

2.1 PHASE IV HELP MODEL

The Hydrologic Evaluation of Landfill Performance (HELP) Model, Version 3.07 was used to estimate the quantity of leachate that would be generated and recirculated within Phase IV at AEL. The HELP Model is a quasi-two-dimensional hydrologic model of water movement across, into, through, and out of the landfill. The model uses climate, soil, and landfill design data to perform a solution technique that accounts for the effects of surface storage, run-off, infiltration, percolation, soil moisture storage, evapotranspiration, and lateral drainage.

Leachate generation was evaluated for active (20-feet of waste), interim (60-feet of waste), and closed (120-feet of waste) landfill conditions utilizing the worst-case scenario of a slope length of 330 feet at 1%.

2.1.1 HELP Model Setup

To provide for a conservative demonstration, the active stage of 20-feet of waste was modeled for one year. The interim stage of 60-feet of waste with intermediate cover was modeled for 15 years. The closed stage of 120-feet of waste with intermediate cover was modeled for 30 years. The initial moisture contents were initialized by the HELP program to steady-state moisture conditions. The HELP model suggested the evaporative zone depth and leaf area index for Tulsa, Oklahoma. In addition, the HELP model calculated the Soil Conservation Service (SCS) runoff curve numbers based on soil data and expected ground cover, surface slope, and slope length.

The runoff potential was 20 percent for the active working face stage. The runoff potential was 50 percent for the interim fill stage since these portions of the landfill will be rough graded with intermediate cover and temporary stormwater drainage structures will be in place. The runoff potential was 100 percent for the closed stage since all portions of the landfill will be graded with final cover and stormwater drainage structures will be in place. The leachate recirculation rate from the leachate collection layer into the waste layer was set to 100 percent for all stages.

2.1.2 Climate Data Input

Precipitation data was synthetically generated by the HELP program using program defaults for Tulsa, Oklahoma. The average annual precipitation over the modeled one-year period was 32.52 inches. Temperature and solar radiation data were also synthetically generated by the HELP program using program defaults for Tulsa, Oklahoma.

2.1.3 Landfill Profile

The landfill profiles for the active and interim stages of the landfill development are presented in the attached HELP Model summary sheets (Appendix A). The composite liner system in Phase IV consists of two feet of clay overlain by a 60-mil HDPE Geomembrane. The clay liner (barrier soil) was modeled with a hydraulic conductivity of 1×10^{-7} cm/sec. Default characteristics from the HELP Users Guide Table 4 (Default Soil, Waste, and Geosynthetic Characteristics) were selected for the barrier soil and

60-mil HDPE Geomembrane liner. The 60-mil HDPE Geomembrane was modeled for good installation quality, 1 defect per acre, and a pinhole density of 0.5 holes/acre.

2.1.4 Waste Layers

Waste layer thicknesses were described above. The default characteristics were selected from the HELP model to represent municipal solid waste.

2.1.5 Intermediate Cover

The intermediate cover consists of a 6-inch thick layer of soil placed over the waste. Default soil characteristics from the HELP model were selected to represent the available on-site soils.

2.1.6 HELP Model Output

Leachate generation was evaluated for active, interim, and closed landfill conditions. An explanation of the assumed conditions, methodologies, models, and printouts of the results are included in Appendix B. Consistent with OAC 252:515-13-31, the leachate collection system will maintain less than 12-inches of head on the liner in all cases.

2.2 LATERAL EXPANSION HELP MODEL

The HELP model, Version 4.0 Beta (2018), was used to estimate the potential volume of leachate that would be generated and recirculated within the lateral expansion area at AEL. Leachate generation was evaluated for active (20-feet of waste), interim (80-feet of waste), and closed (397-feet of waste) landfill conditions utilizing the worst-case scenario of a slope length of 250 feet at 0.5%.

2.2.1 HELP Model Setup

To provide for a conservative demonstration, the active stage of 20-feet of waste was modeled for one year. The interim stage of 80-feet of waste with intermediate cover was modeled for 15 years. The closed stage of 397-feet of waste with final cover was modeled for 30 years. The initial moisture contents were initialized by the HELP program to steady-state moisture conditions. The HELP model suggested the evaporative zone depth and leaf area index for Tulsa, Oklahoma. In addition, the HELP model calculated the Soil Conservation Service (SCS) runoff curve numbers based on soil data and expected ground cover, surface slope, and slope length.

The runoff potential was 30 percent for the active working face stage. The runoff potential was 50 percent for the interim fill stage since these portions of the landfill will be rough graded with intermediate cover and temporary stormwater drainage structures will be in place. The runoff potential was 100 percent for the closed stage since all portions of the landfill will be graded with final cover and stormwater drainage structures will be in place. The leachate recirculation rate from the leachate collection layer into the waste layer was set to 100 percent for all stages.

2.2.2 Climate Data Input

Precipitation data was synthetically generated by the HELP program using program defaults for Tulsa, Oklahoma. The average annual precipitation over the modeled active, interim, and closed stages was 43.62-inches, 36.87-inches, and 37.26-inches, respectively. Temperature and solar

radiation data were also synthetically generated by the HELP program using program defaults for Tulsa, Oklahoma.

2.2.3 Landfill Profile

The landfill profiles for the active and interim stages of the landfill development are presented in the attached HELP Model summary sheets (Appendix A). The composite liner system in the lateral expansion area will consist of two feet of clay overlain by a 60-mil HDPE Geomembrane. The clay liner (barrier soil) was modeled with a hydraulic conductivity of 1 X 10^{-7} cm/sec. Default characteristics from the HELP Users Guide Table 4 (Default Soil, Waste, and Geosynthetic Characteristics) were selected for the barrier soil and 60-mil HDPE Geomembrane liner. The 60-mil HDPE Geomembrane was modeled for good installation quality, 1 defect per acre, and a pinhole density of 0.5 holes/acre.

2.2.4 Waste Layers

Waste layer thicknesses were described above. The default characteristics were selected from the HELP model to represent municipal solid waste.

2.2.5 Intermediate Cover

The intermediate cover consists of a 6-inch (active and interim stages) or 12-inch (closed stage) thick layer of soil placed over the waste. Default soil characteristics from the HELP model were selected to represent the available on-site soils.

2.2.6 HELP Model Output

Leachate generation was evaluated for active, interim, and closed landfill conditions. An explanation of the assumed conditions, methodologies, models, and printouts of the results are included in Appendix B. Consistent with OAC 252:515-13-31, the leachate collection system will maintain less than 12-inches of head on the liner in all cases.

2.3 IMPACT OF RECIRCULATION

AEL proposes to recirculate up to 100% of the leachate collected from composite lined areas of Phase IV and the lateral expansion area. The results indicate that the leachate collection systems are adequate to recirculate up to 100% of the leachate collected from composite lined areas without exceeding 12-inches head on the liner system. SCS recommends that the leachate be allowed to recirculate in all areas constructed with a composite liner system (Phase III, IV, and V) as well as all future Phases (lateral expansion area), provided that the liner and drainage system installed meets the requirements of this recirculation plan. If the liner and drainage system installed does not meet the requirements of this plan, then a new plan shall be required.

The leachate collection systems utilize filter Geotextile to prevent clogging of the drainage layers. Once leachate recirculation begins, the filter Geotextile will be required to handle a larger volume of leachate than conventional leachate collection systems. As a result of this increased flow, the Geotextile must filter a greater number of particles. Clogging of the Geotextile must therefore be addressed.

The selection of the Geotextile used in the leachate collection systems has incorporated the possibility of clogging from the leachate recirculation process. The Geosynthetic Research Institute

(GRI) has performed extensive studies on the issues of Geotextile clogging. A report by the GRI, a discussion of field behavior, laboratory testing, computer modeling, and design method development was presented. While the report does not provide a minimum allowable permeability, it generally appears that leachate flow through a Geotextile does not become excessively inhibited unless the Geotextile permeability becomes less than 1.0×10^{-5} cm/sec. Initially, the permeability of a typical nonwoven Geotextile is on the order of 1.0×10^{-1} cm/sec; thus, the Geotextile can undergo a significant amount of clogging before reaching the 1.0×10^{-5} cm/sec level.

A calculation of flow through a Geotextile, which has clogged to a permeability of 1.0×10^{-5} cm/sec can be performed. Assuming a conservative hydraulic gradient of 1.0 to minimize the flow through the clogged leachate collection layer, the flow through the layer is:

$Q = k \times i \times A$

Where 'k' is the hydraulic conductivity, 'i' is the hydraulic gradient, and 'A' is the per unit area.

$Q = 1.0 \times 10^{-5}$ cm/sec*(1.0)*(1 acre)*(1 inch/2.54 cm)*(1 ft/12 inch)*(43,560 ft^2/acre)

$Q = 1.43 \times 10^{-2}$ ft^3/sec/acre*(3600 sec/1 hour)*(24 hour/1 day)

$Q = 1{,}235$ ft^3/acre/day

$Q = 450{,}775$ ft^3/acre/year

The anticipated total amount of leachate generated per year for Phase IV and the lateral expansion area are approximately 86,870 ft^3/acre/year and 90,885 ft^3/acre/year, respectively (see HELP modeling in Appendix A and B). Because the allowable flow from the clogged Geotextile (450,775 ft^3/acre/year) is larger than the amount of leachate generated and recirculated, it is not expected that Geotextile clogging will prevent the continuous flow of leachate through the landfill.

3.0 LEACHATE RECIRCULATION METHODS AND MANAGEMENT

In accordance with ODEQ guidelines, recirculation of leachate will only occur over areas of the AEL that have been constructed with an ODEQ-approved Subtitle D composite liner system. Currently, AEL has an ODEQ-approved Subtitle D composite liner system in Phases III, IV, and V.

3.1 RECIRCULATION METHOD

Leachate will be recirculated over ODEQ-approved Subtitle D composite liner systems by means of surface spraying, horizontal trench, vertical well, and permeable blanket methods. The proposed methods of leachate recirculation can be accomplished by the following methods:

Water Truck – Leachate is distributed from a water truck using a spray bar or a hose. Leachate would only be sprayed within the limits of the composite lined cells. A hose would be used to spray leachate back onto the working face of the landfill.

Sprinkler Reel – Leachate is pumped from the leachate pond via HDPE pipe (dual-contained HDPE outside composite lined areas) to the crest of the landfill. Leachate will be distributed within the limits of the composite lined cells using a sprinkler reel.

Horizontal Trenches – Leachate is distributed through a network of perforated pipes placed within trenches in the waste fill at regular vertical intervals and backfilled with permeable materials (sand, aggregate, shredded tires, crushed glass, etc.).

Permeable Blankets – Leachate is distributed through a perforated pipe placed within a blanket of permeable material (aggregate, shredded tires, crushed glass, etc.). The dimensions of the permeable blankets are anticipated to be 1 foot thick by 200 feet wide. The length of the permeable blankets will vary depending on the underlying waste thickness and required leachate recirculation buffer zone.

Vertical Wells – Leachate is injected into vertical wells constructed of solid pipe to 10 feet below ground surface with the remaining borehole space consisting of aggregate material. The spacing and location of vertical wells will be dependent upon the underlying waste thickness; in order to distribute the leachate uniformly, and comply with the required leachate recirculation buffer zone. The vertical wells will not extend further than 15-20 feet above the liner elevation.

A leachate recirculation buffer zone will be established between the Pre-Subtitle D non-composite lined areas and the Subtitle D composite lined areas at a ratio of 1 to 1 of the total landfill height versus horizontal distance from the edge of the composite lined area (Phases III and V). For example, if the waste thickness in an area of leachate recirculation is 30 feet thick, leachate recirculation will not be conducted within 30 feet of the phase boundary between the Pre-Subtitle D non-composite lined area and the Subtitle D composite lined area.

3.2 RECIRCULATION MANAGEMENT

Leachate recirculation will not be performed immediately before, during, or immediately after rainfall events or during freezing temperatures and will only occur over areas lined with an ODEQ-approved Subtitle D composite liner system. A buffer zone will be established between the Pre-Subtitle D non-

composite lined areas and the Subtitle D composite lined areas at a ratio of 1 to 1 of the total landfill height versus horizontal distance from the edge of the composite lined area (Phases III and V).

The rate of application will not exceed the moisture-holding capacity of the landfill. For example, the application rate will be applied so that no seeps or ponding is observed in the vicinity of the recirculation area. Recirculation volumes will be recorded and monitored on a monthly basis to ensure continued performance of the system.

The compaction of the waste is typically uniform across each lift. If there are leachate outbreaks on the outside slopes, then leachate recirculation will be stopped. Any outbreak will be repaired by plugging. If plugging does not work, other measures will be taken to relieve the leachate outbreak.

All employees working in the leachate recovery and recirculation area will be required to wear Personal Protective Equipment (PPE) necessary to minimize contact with the leachate. At a minimum, this PPE will include rubber boots, rubber gloves, and safety glasses.

Due to the possibility of wind-born leachate droplets being carried off-site, all spraying of leachate will be stopped during sustained winds in excess of 45 mph.

The American Environmental Landfill does not believe that odor will be an issue. However, if odor becomes an issue, the first response will be to cover as much waste as possible and the second response will be to stop recirculation until the odor issue has been resolved to the satisfaction of the ODEQ.

3.3 LEACHATE SAMPLING REQUIREMENTS AND PROCEDURES

In accordance with ODEQ guidelines, leachate will be sampled at the leachate pond and analyzed for pH, COD, specific conductivity, chloride, sulfate, calcium, magnesium, nitrates, sodium, carbonates, potassium, and those constituents identified in Appendix A of OAC 252:515-9-31(d)(1)(A). The samples will be handled and processed consistent with the procedures specified in the site's approved Groundwater Sampling and Analysis Plan.

Leachate sampling will be performed semi-annually in conjunction with groundwater sampling in accordance with the previously approved LRSOP.

3.4 SYSTEM ASSESSMENT

The site will be periodically inspected to verify that no known leachate springs or seeps have occurred and that leachate has not commingled with stormwater runoff that has been discharged from the site as a direct result of the operation of the leachate recirculation system. This inspection will also include an evaluation of the operating procedures to verify compliance with ODEQ guidelines.

In addition to the periodic inspections discussed above, an annual assessment will be submitted to the ODEQ documenting the performance of the recirculation system. The annual assessment will include an estimate of the volume of leachate recirculated and a summary of the analytical results.

Appendix A

Phase IV HELP Model Summary

Lateral Expansion Area HELP Model Summary

Phase IV HELP Model Summary

AMERICAN ENVIRONMENTAL LANDFILL
TIER I PERMIT MODIFICATION - PHASE IV CELL DESIGN
ODEQ PERMIT NO. 3557021
HELP MODEL VERSION 3.07
INPUT AND OUTPUT DATA

			Active (20-ft of Waste)	Interim (60-ft of Waste)	Closed (120-ft of Waste)
INPUT	GENERAL INFORMATION	No. of Years	1	15	30
		Ground Cover	Bare	Fair	Good
		SCS Runoff Curve No.	97	90.7	87.5
		Model Area (Acres)	1	1	1
		Runoff Area (%)	20	50	100
		Maximum Leaf Area Index	1	1	1
		Evaporative Zone Depth (inches)	10	10	10
	INTERMEDIATE COVER (Texture = 26)	Thickness (inches)	6	6	6
		Porosity (vol/vol)	0.445	0.445	0.445
		Field Capacity (vol/vol)	0.393	0.393	0.393
		Wilting Point (volvol)	0.277	0.277	0.277
		Initial Soil Water Content (vol/vol)	0.2991	0.2936	0.2868
		Saturated Hydraulic Conductivity (cm/sec)	1.90E-06	1.90E-06	1.90E-06
	WASTE (Texture = 18)	Thickness (inches)	240	720	1440
		Porosity (vol/vol)	0.671	0.671	0.671
		Field Capacity (vol/vol)	0.292	0.292	0.292
		Wilting Point (volvol)	0.077	0.077	0.077
		Initial Soil Water Content (vol/vol)	0.289	0.2909	0.2915
		Saturated Hydraulic Conductivity (cm/sec)	1.00E-03	1.00E-03	1.00E-03
	LEACHATE COLLECTION LAYER (Texture = 5)	Thickness (inches)	12	12	12
		Porosity (vol/vol)	0.457	0.457	0.457
		Field Capacity (vol/vol)	0.131	0.131	0.131
		Wilting Point (volvol)	0.058	0.058	0.058
		Initial Soil Water Content (vol/vol)	0.162	0.161	0.158
		Saturated Hydraulic Conductivity (cm/sec)	1.00E-03	1.00E-03	1.00E-03
		Drainage Length (ft)	330.0	330.0	330.0
	FLEXIBLE MEMBRANE LINER (Texture = 35)	Thickness (inches)	0.06	0.06	0.06
		Saturated Hydraulic Conductivity (cm/sec)	1.90E-13	1.90E-13	1.90E-13
		Pinhole Density (holes/acre)	0.5	0.5	0.5
		Installation Defects (holes/acre)	1	1	1
		Placement Quality	3-Good	3-Good	3-Good
	BARRIER SOIL LINER (Texture = 16)	Thickness (inches)	24	24	24
		Porosity (vol/vol)	0.427	0.427	0.427
		Field Capacity (vol/vol)	0.418	0.418	0.418
		Wilting Point (volvol)	0.367	0.367	0.367
		Initial Soil Water Content (vol/vol)	0.427	0.427	0.427
		Saturated Hydraulic Conductivity (cm/sec)	1.00E-07	1.00E-07	1.00E-07
OUTPUT	PRECIPITATION	Average Annual (in)	32.52	32.52	32.52
	RUNOFF	Average Annual (in)	7.69	11.97	19.30
	EVAPOTRANSPIRATION	Average Annual (in)	24.84	20.58	13.28
	LATERAL DRAINAGE COLLECTED	Average Annual (cf/acre/year)	237.25	226.82	205.76
		Peak Daily (cf/acre/day)	0.7010	0.6780	0.6189
	HEAD ON LINER	Average Annual (in)	1.043	0.997	0.901
		Peak Daily (in)	1.124	1.922	1.767
	PERCOLATION	Average Annual (cubic feet/year)	1.1880	1.1400	1.0430
		Peak Daily (cubic feet/day)	0.0035	0.0034	0.0031

Lateral Expansion Area HELP Model Summary

American Environmental Landfill
Help Model Version 4.0

		Active (20-ft of Waste)	Interim (80-ft of Waste)	Closed 397-ft of Waste)
General Information	No. of Years	1	15	30
	Ground Cover	Poor	Good	Good
	SCS Runoff Curve Number	97.1	91.3	97.1
	Model Area (Ac)	1	1	1
	Runoff Area (%)	30	50	100
	Max Leaf Area Index	1	1	1
	Evaporative Zone Depth	10	10	10
Intermediate Cover	Thickness (inches)	6	6	12
	Porosity (vol/vol)	0.445	0.445	0.445
	Field Capacity (vol/vol)	0.393	0.393	0.393
	Wilting Point (vol/vol)	0.277	0.277	0.277
	Initial Soil water Content (vol/vol)	0.3567	0.2736	0.2736
	Saturated Hydraulic Conductivity (cm/sec)	1.90E-06	1.90E-06	1.90E-06
Waste	Thickness (inches)	240	960	4764
	Porosity (vol/vol)	0.672	0.671	0.671
	Field Capacity (vol/vol)	0.292	0.292	0.292
	Wilting Point (vol/vol)	0.077	0.077	0.077
	Initial Soil water Content (vol/vol)	0.2888	0.2912	0.292
	Saturated Hydraulic Conductivity (cm/sec)	1.00E-03	1.00E-03	1.00E-03
Leachate Collection Layer	Thickness (inches)	12	12	12
	Porosity (vol/vol)	0.457	0.457	0.457
	Field Capacity (vol/vol)	0.131	0.131	0.131
	Wilting Point (vol/vol)	0.058	0.058	0.058
	Initial Soil water Content (vol/vol)	0.1742	0.1455	0.135
	Saturated Hydraulic Conductivity (cm/sec)	1.00E-03	1.00E-03	1.00E-03
	Slope (ft/ft)	0.5%	0.5%	0.5%
	Reach (ft)	250	250	250
Flexible Membrane Liner	Thickness (inches)	0.06	0.06	0.06
	Saturated Hydraulic Conductivity (cm/sec)	2.00E-13	2.00E-13	2.00E-13
	Pinhole Density (holes/ac)	0.5	0.5	0.5
	Installation Defects (holes/ac)	1	1	1
	Placement Quality	Good	Good	Good
Barrier Soil Liner	Thickness (inches)	24	24	24
	Porosity (vol/vol)	0.427	0.427	0.427
	Field Capacity (vol/vol)	0.418	0.418	0.418
	Wilting Point (vol/vol)	0.367	0.367	0.367
	Initial Soil water Content (vol/vol)	0.427	0.427	0.427
	Saturated Hydraulic Conductivity (cm/sec)	1.00E-07	1.00E-07	1.00E-07
Precipitation	Average Annual (in)	43.62	36.87	37.26
Runoff	Average Annual (in)	14.639	13.369	22.193
Evapotranspiration	Average Annual (in)	28.972	23.487	15.068
Lateral Drainage Collected	Average Annual (cf/ac/day)	249	162.6	31.4
	Peak Daily (cf/ac/day)	0.7291	0.7985	0.2881
Head on Liner	Average Annual (in)	1.6577	1.0817	0.2087
	Peak Daily (in)	2.6312	2.8386	1.1774
Percolation	Average Annual (cf/ac/day)	0.000501	0.000337	0.2664
	Peak Daily (cf/ac/day)	0.0053	0.0058	0.0023

Appendix B

Phase IV HELP Model Results

Lateral Expansion HELP Model Results

Phase IV HELP Model Results

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** HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
** HELP MODEL VERSION 3.07 (1 NOVEMBER 1997)
** DEVELOPED BY ENVIRONMENTAL LABORATORY
** USAE WATERWAYS EXPERIMENT STATION
** FOR USEPA RISK REDUCTION ENGINEERING LABORATORY
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PRECIPITATION DATA FILE: C:\HELP_MOD\AELIVBA.D4
TEMPERATURE DATA FILE: C:\HELP_MOD\AELIVBA.D7
SOLAR RADIATION DATA FILE: C:\HELP_MOD\AELIVBA.D13
EVAPOTRANSPIRATION DATA: C:\HELP_MOD\AELIVBA.D11
SOIL AND DESIGN DATA FILE: C:\HELP_MOD\AELIVBA.D10
OUTPUT DATA FILE: C:\HELP_MOD\AELIVBA.OUT

TIME: 13:58 DATE: 3/5/2015

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TITLE: AMERICAN ENV. LF - PHASE IV ACTIVE

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NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 26

THICKNESS	=	6.00	INCHES
POROSITY	=	0.4450	VOL/VOL
FIELD CAPACITY	=	0.3930	VOL/VOL
WILTING POINT	=	0.2770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2991	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.190000003000E-05	CM/SEC

NOTE: 100.00 PERCENT OF THE DRAINAGE COLLECTED FROM LAYER # 3
IS RECIRCULATED INTO THIS LAYER.
NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 1.80
FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

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LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	240.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2887	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 5

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4570	VOL/VOL
FIELD CAPACITY	=	0.1310	VOL/VOL
WILTING POINT	=	0.0580	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1615	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC
SLOPE	=	1.00	PERCENT
DRAINAGE LENGTH	=	330.0	FEET

NOTE: 100.00 PERCENT OF THE DRAINAGE COLLECTED FROM THIS LAYER IS RECIRCULATED INTO LAYER # 1.

LAYER 4

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.50	HOLES/ACRE
FML INSTALLATION DEFECTS	=	1.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 5

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #26 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 25.% AND A SLOPE LENGTH OF 360. FEET.

SCS RUNOFF CURVE NUMBER	=	97.00	
FRACTION OF AREA ALLOWING RUNOFF	=	20.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	10.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2.183	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	5.354	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.970	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	83.281	INCHES
TOTAL INITIAL WATER	=	83.281	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM TULSA OKLAHOMA

STATION LATITUDE	=	36.12	DEGREES
MAXIMUM LEAF AREA INDEX	=	1.00	
START OF GROWING SEASON (JULIAN DATE)	=	85	
END OF GROWING SEASON (JULIAN DATE)	=	311	
EVAPORATIVE ZONE DEPTH	=	10.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	10.50	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	64.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	67.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	66.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	68.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR TULSA OKLAHOMA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
1.35	1.74	3.14	4.15	5.14	4.57
3.51	3.01	4.37	3.41	2.56	1.82

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR TULSA OKLAHOMA

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NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
35.20	40.70	49.30	60.90	69.10	77.70
83.20	81.70	73.80	62.60	49.20	39.80

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR TULSA OKLAHOMA
AND STATION LATITUDE = 36.12 DEGREES

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MONTHLY TOTALS (IN INCHES) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.57	0.88	1.01	2.22	1.75	5.70
	3.64	2.13	8.00	2.39	3.64	0.59
RUNOFF	0.047	0.052	0.119	0.523	0.177	1.393
	0.471	0.272	2.536	0.625	1.355	0.123
EVAPOTRANSPIRATION	0.422	0.537	1.512	1.624	1.585	4.348
	3.208	1.858	4.498	2.000	2.636	0.609
LATERAL DRAINAGE RECIRCULATED	0.0059	0.0053	0.0058	0.0055	0.0056	0.0053
INTO LAYER 1	0.0054	0.0053	0.0051	0.0053	0.0051	0.0057
LATERAL DRAINAGE COLLECTED	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FROM LAYER 3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LATERAL DRAINAGE RECIRCULATED	0.0059	0.0053	0.0058	0.0055	0.0056	0.0053
FROM LAYER 3	0.0054	0.0053	0.0051	0.0053	0.0051	0.0057
PERCOLATION/LEAKAGE THROUGH	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LAYER 5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	1.116	1.098	1.081	1.064	1.047	1.031
TOP OF LAYER 4	1.020	1.003	0.995	0.994	0.983	1.079
STD. DEVIATION OF DAILY	0.005	0.005	0.005	0.005	0.005	0.004
HEAD ON TOP OF LAYER 4	0.005	0.005	0.007	0.005	0.002	0.045

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	32.52	118047.602	100.00
RUNOFF	7.693	27924.369	23.66
EVAPOTRANSPIRATION	24.837	90156.977	76.37
RECIRCULATION INTO LAYER 1	0.065359	237.254	0.20
DRAINAGE COLLECTED FROM LAYER 3	0.0000	0.000	0.00
RECIRCULATION FROM LAYER 3	0.065359	237.254	0.20
PERC./LEAKAGE THROUGH LAYER 5	0.000327	1.188	0.00
AVG. HEAD ON TOP OF LAYER 4	1.0426		
CHANGE IN WATER STORAGE	-0.010	-34.868	-0.03
SOIL WATER AT START OF YEAR	83.281	302310.594	
SOIL WATER AT END OF YEAR	83.272	302275.750	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.068	0.00

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	0.57	0.88	1.01	2.22	1.75	5.70
	3.64	2.13	8.00	2.39	3.64	0.59
STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
RUNOFF						
TOTALS	0.047	0.052	0.119	0.523	0.177	1.393
	0.471	0.272	2.536	0.625	1.355	0.123
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	0.422	0.537	1.512	1.624	1.585	4.348
	3.208	1.858	4.498	2.000	2.636	0.609
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

LATERAL DRAINAGE RECIRCULATED INTO LAYER 1

TOTALS	0.0059	0.0053	0.0058	0.0055	0.0056	0.0053
	0.0054	0.0053	0.0051	0.0053	0.0051	0.0057
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

LATERAL DRAINAGE COLLECTED FROM LAYER 3

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

LATERAL DRAINAGE RECIRCULATED FROM LAYER 3

TOTALS	0.0059	0.0053	0.0058	0.0055	0.0056	0.0053
	0.0054	0.0053	0.0051	0.0053	0.0051	0.0057
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 5

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES	1.1156	1.0984	1.0814	1.0641	1.0471	1.0314
	1.0197	1.0031	0.9953	0.9942	0.9829	1.0785
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 1

	AELIVA INCHES		CU. FEET	PERCENT
PRECIPITATION	32.52	(0.000)	118047.6	100.00
RUNOFF	7.693	(0.0000)	27924.37	23.655
EVAPOTRANSPIRATION	24.837	(0.0000)	90156.98	76.373
DRAINAGE RECIRCULATED INTO LAYER 1	0.06536	(0.00000)	237.254	0.20098
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.00000	(0.00000)	0.000	0.00000
DRAINAGE RECIRCULATED FROM LAYER 3	0.06536	(0.00000)	237.254	0.20098
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.00033	(0.00000)	1.188	0.00101
AVERAGE HEAD ON TOP OF LAYER 4	1.043	(0.000)		
CHANGE IN WATER STORAGE	-0.010	(0.0000)	-34.87	-0.030

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 1

	(INCHES)	(CU. FT.)
PRECIPITATION	1.97	7151.100
RUNOFF	0.534	1937.9286
DRAINAGE RECIRCULATED INTO LAYER 1	0.00020	0.71030
DRAINAGE COLLECTED FROM LAYER 3	0.00000	0.00000
DRAINAGE RECIRCULATED FROM LAYER 3	0.00019	0.70097
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.000001	0.00349
AVERAGE HEAD ON TOP OF LAYER 4	1.124	
MAXIMUM HEAD ON TOP OF LAYER 4	1.982	
LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN)	39.1 FEET	
SNOW WATER	0.57	2070.2432
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3379	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1970	

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*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(INCHES)	(VOL/VOL)
1	1.7953	0.2992
2	69.3000	0.2887
3	1.9282	0.1607
4	0.0000	0.0000
5	10.2480	0.4270
SNOW WATER	0.000	

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** HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
** HELP MODEL VERSION 3.07 (1 NOVEMBER 1997)
** DEVELOPED BY ENVIRONMENTAL LABORATORY
** USAE WATERWAYS EXPERIMENT STATION
** FOR USEPA RISK REDUCTION ENGINEERING LABORATORY
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PRECIPITATION DATA FILE: C:\HELP_MOD\AELIVBI.D4
TEMPERATURE DATA FILE: C:\HELP_MOD\AELIVBI.D7
SOLAR RADIATION DATA FILE: C:\HELP_MOD\AELIVBI.D13
EVAPOTRANSPIRATION DATA: C:\HELP_MOD\AELIVBI.D11
SOIL AND DESIGN DATA FILE: C:\HELP_MOD\AELIVBI.D10
OUTPUT DATA FILE: C:\HELP_MOD\AELIVBI.OUT

TIME: 14:56 DATE: 3/5/2015

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TITLE: AMERICAN ENV. LF - PHASE IV INTERIM

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NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 26

THICKNESS	=	6.00	INCHES
POROSITY	=	0.4450	VOL/VOL
FIELD CAPACITY	=	0.3930	VOL/VOL
WILTING POINT	=	0.2770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2936	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.190000003000E-05	CM/SEC

NOTE: 100.00 PERCENT OF THE DRAINAGE COLLECTED FROM LAYER # 3
IS RECIRCULATED INTO THIS LAYER.
NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 1.80
FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

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LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	720.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2909	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 5

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4570	VOL/VOL
FIELD CAPACITY	=	0.1310	VOL/VOL
WILTING POINT	=	0.0580	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1605	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC
SLOPE	=	1.00	PERCENT
DRAINAGE LENGTH	=	330.0	FEET

NOTE: 100.00 PERCENT OF THE DRAINAGE COLLECTED FROM THIS LAYER IS RECIRCULATED INTO LAYER # 1.

LAYER 4

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.50	HOLES/ACRE
FML INSTALLATION DEFECTS	=	1.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 5

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #26 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 25.% AND A SLOPE LENGTH OF 360. FEET.

SCS RUNOFF CURVE NUMBER	=	90.70	
FRACTION OF AREA ALLOWING RUNOFF	=	50.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	10.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2.150	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	5.354	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.970	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	223.396	INCHES
TOTAL INITIAL WATER	=	223.396	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM TULSA OKLAHOMA

STATION LATITUDE	=	36.12 DEGREES
MAXIMUM LEAF AREA INDEX	=	1.00
START OF GROWING SEASON (JULIAN DATE)	=	85
END OF GROWING SEASON (JULIAN DATE)	=	311
EVAPORATIVE ZONE DEPTH	=	10.0 INCHES
AVERAGE ANNUAL WIND SPEED	=	10.50 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	64.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	66.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	68.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR TULSA OKLAHOMA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
1.35	1.74	3.14	4.15	5.14	4.57
3.51	3.01	4.37	3.41	2.56	1.82

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR TULSA OKLAHOMA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

AELIVI

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
35.20	40.70	49.30	60.90	69.10	77.70
83.20	81.70	73.80	62.60	49.20	39.80

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR TULSA OKLAHOMA
AND STATION LATITUDE = 36.12 DEGREES

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MONTHLY TOTALS (IN INCHES) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.57	0.88	1.01	2.22	1.75	5.70
	3.64	2.13	8.00	2.39	3.64	0.59
RUNOFF	0.100	0.085	0.207	0.864	0.324	2.398
	0.782	0.487	3.932	0.828	1.766	0.201
EVAPOTRANSPIRATION	0.376	0.470	1.418	1.276	1.447	3.373
	2.867	1.646	3.601	1.510	2.380	0.218
LATERAL DRAINAGE RECIRCULATED	0.0057	0.0051	0.0056	0.0053	0.0054	0.0051
INTO LAYER 1	0.0052	0.0051	0.0049	0.0050	0.0048	0.0052
LATERAL DRAINAGE COLLECTED	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FROM LAYER 3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LATERAL DRAINAGE RECIRCULATED	0.0057	0.0051	0.0056	0.0053	0.0054	0.0051
FROM LAYER 3	0.0052	0.0051	0.0049	0.0050	0.0048	0.0052
PERCOLATION/LEAKAGE THROUGH	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LAYER 5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	1.079	1.062	1.046	1.030	1.014	0.998
TOP OF LAYER 4	0.982	0.966	0.950	0.935	0.928	0.975
STD. DEVIATION OF DAILY	0.005	0.005	0.005	0.004	0.005	0.005
HEAD ON TOP OF LAYER 4	0.005	0.005	0.004	0.005	0.018	0.005

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AELIVI

ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	32.52	118047.602	100.00
RUNOFF	11.974	43463.879	36.82
EVAPOTRANSPIRATION	20.583	74716.031	63.29
RECIRCULATION INTO LAYER 1	0.062486	226.824	0.19
DRAINAGE COLLECTED FROM LAYER 3	0.0000	0.000	0.00
RECIRCULATION FROM LAYER 3	0.062486	226.824	0.19
PERC./LEAKAGE THROUGH LAYER 5	0.000314	1.140	0.00
AVG. HEAD ON TOP OF LAYER 4	0.9969		
CHANGE IN WATER STORAGE	-0.037	-133.433	-0.11
SOIL WATER AT START OF YEAR	223.396	810928.125	
SOIL WATER AT END OF YEAR	223.359	810794.687	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.018	0.00

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	0.57	0.88	1.01	2.22	1.75	5.70
	3.64	2.13	8.00	2.39	3.64	0.59
STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
RUNOFF						
TOTALS	0.100	0.085	0.207	0.864	0.324	2.398
	0.782	0.487	3.932	0.828	1.766	0.201
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	0.376	0.470	1.418	1.276	1.447	3.373
	2.867	1.646	3.601	1.510	2.380	0.218
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

LATERAL DRAINAGE RECIRCULATED INTO LAYER 1

TOTALS	0.0057	0.0051	0.0056	0.0053	0.0054	0.0051
	0.0052	0.0051	0.0049	0.0050	0.0048	0.0052
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

LATERAL DRAINAGE COLLECTED FROM LAYER 3

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

LATERAL DRAINAGE RECIRCULATED FROM LAYER 3

TOTALS	0.0057	0.0051	0.0056	0.0053	0.0054	0.0051
	0.0052	0.0051	0.0049	0.0050	0.0048	0.0052
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 5

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES	1.0789	1.0622	1.0459	1.0296	1.0138	0.9976
	0.9816	0.9656	0.9502	0.9350	0.9275	0.9752
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 1

	INCHES	CU. FEET	PERCENT

	AELIVI		
PRECIPITATION	32.52 (0.000)	118047.6	100.00
RUNOFF	11.974 (0.0000)	43463.88	36.819
EVAPOTRANSPIRATION	20.583 (0.0000)	74716.03	63.293
DRAINAGE RECIRCULATED INTO LAYER 1	0.06249 (0.00000)	226.824	0.19215
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.00000 (0.00000)	0.000	0.00000
DRAINAGE RECIRCULATED FROM LAYER 3	0.06249 (0.00000)	226.824	0.19215
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.00031 (0.00000)	1.140	0.00097
AVERAGE HEAD ON TOP OF LAYER 4	0.997 (0.000)		
CHANGE IN WATER STORAGE	-0.037 (0.0000)	-133.43	-0.113

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 1

	(INCHES)	(CU. FT.)
PRECIPITATION	1.97	7151.100
RUNOFF	0.953	3460.8040
DRAINAGE RECIRCULATED INTO LAYER 1	0.00021	0.76219
DRAINAGE COLLECTED FROM LAYER 3	0.00000	0.00000
DRAINAGE RECIRCULATED FROM LAYER 3	0.00019	0.67803
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.000001	0.00338
AVERAGE HEAD ON TOP OF LAYER 4	1.087	
MAXIMUM HEAD ON TOP OF LAYER 4	1.922	
LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN)	38.3 FEET	
SNOW WATER	0.57	2070.2432

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3084
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1970

*** Maximum heads are computed using McEnroe's equations. ***

AELIVI

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(INCHES)	(VOL/VOL)
1	1.7642	0.2940
2	209.4600	0.2909
3	1.8873	0.1573
4	0.0000	0.0000
5	10.2480	0.4270
SNOW WATER	0.000	

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**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE                **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                 **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                    **
**                    USAE WATERWAYS EXPERIMENT STATION                      **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY               **
**                                                                           **
**                                                                           **
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PRECIPITATION DATA FILE: C:\HELP_MOD\AELIVBC.D4
TEMPERATURE DATA FILE: C:\HELP_MOD\AELIVBC.D7
SOLAR RADIATION DATA FILE: C:\HELP_MOD\AELIVBC.D13
EVAPOTRANSPIRATION DATA: C:\HELP_MOD\AELIVBC.D11
SOIL AND DESIGN DATA FILE: C:\HELP_MOD\AELIVBC.D10
OUTPUT DATA FILE: C:\HELP_MOD\AELIVBC.OUT

TIME: 15:14 DATE: 3/5/2015

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TITLE: AMERICAN ENV. LF - PHASE IV CLOSED

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NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 26

THICKNESS	=	6.00	INCHES
POROSITY	=	0.4450	VOL/VOL
FIELD CAPACITY	=	0.3930	VOL/VOL
WILTING POINT	=	0.2770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2868	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.190000003000E-05	CM/SEC

NOTE: 100.00 PERCENT OF THE DRAINAGE COLLECTED FROM LAYER # 3
IS RECIRCULATED INTO THIS LAYER.
NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 1.80
FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

AELIVC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	1440.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2915	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 5

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4570	VOL/VOL
FIELD CAPACITY	=	0.1310	VOL/VOL
WILTING POINT	=	0.0580	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1580	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC
SLOPE	=	1.00	PERCENT
DRAINAGE LENGTH	=	330.0	FEET

NOTE: 100.00 PERCENT OF THE DRAINAGE COLLECTED FROM THIS LAYER IS RECIRCULATED INTO LAYER # 1.

LAYER 4

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.50	HOLES/ACRE
FML INSTALLATION DEFECTS	=	1.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 5

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #26 WITH A GOOD STAND OF GRASS, A SURFACE SLOPE OF 25.% AND A SLOPE LENGTH OF 360. FEET.

SCS RUNOFF CURVE NUMBER	=	87.50	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	10.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2.109	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	5.354	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.970	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	433.564	INCHES
TOTAL INITIAL WATER	=	433.564	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM TULSA OKLAHOMA

STATION LATITUDE	=	36.12 DEGREES
MAXIMUM LEAF AREA INDEX	=	1.00
START OF GROWING SEASON (JULIAN DATE)	=	85
END OF GROWING SEASON (JULIAN DATE)	=	311
EVAPORATIVE ZONE DEPTH	=	10.0 INCHES
AVERAGE ANNUAL WIND SPEED	=	10.50 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	64.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	66.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	68.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR TULSA OKLAHOMA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
1.35	1.74	3.14	4.15	5.14	4.57
3.51	3.01	4.37	3.41	2.56	1.82

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR TULSA OKLAHOMA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

AELIVC

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
35.20	40.70	49.30	60.90	69.10	77.70
83.20	81.70	73.80	62.60	49.20	39.80

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR TULSA OKLAHOMA
AND STATION LATITUDE = 36.12 DEGREES

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MONTHLY TOTALS (IN INCHES) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.57	0.88	1.01	2.22	1.75	5.70
	3.64	2.13	8.00	2.39	3.64	0.59
RUNOFF	0.204	0.212	0.411	1.351	0.629	4.054
	1.560	1.037	5.638	1.304	2.496	0.401
EVAPOTRANSPIRATION	0.358	0.476	0.952	0.786	1.146	1.714
	2.091	1.096	2.268	0.862	1.475	0.055
LATERAL DRAINAGE RECIRCULATED	0.0052	0.0047	0.0051	0.0048	0.0049	0.0047
INTO LAYER 1	0.0048	0.0047	0.0045	0.0045	0.0043	0.0044
LATERAL DRAINAGE COLLECTED	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FROM LAYER 3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LATERAL DRAINAGE RECIRCULATED	0.0052	0.0047	0.0051	0.0048	0.0049	0.0047
FROM LAYER 3	0.0048	0.0047	0.0045	0.0045	0.0043	0.0044
PERCOLATION/LEAKAGE THROUGH	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LAYER 5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	0.985	0.970	0.955	0.940	0.925	0.910
TOP OF LAYER 4	0.895	0.881	0.868	0.854	0.841	0.829
STD. DEVIATION OF DAILY	0.005	0.004	0.004	0.004	0.004	0.004
HEAD ON TOP OF LAYER 4	0.004	0.004	0.003	0.004	0.003	0.004

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	32.52	118047.602	100.00
RUNOFF	19.297	70047.625	59.34
EVAPOTRANSPIRATION	13.279	48203.355	40.83
RECIRCULATION INTO LAYER 1	0.056682	205.755	0.17
DRAINAGE COLLECTED FROM LAYER 3	0.0000	0.000	0.00
RECIRCULATION FROM LAYER 3	0.056682	205.755	0.17
PERC./LEAKAGE THROUGH LAYER 5	0.000287	1.043	0.00
AVG. HEAD ON TOP OF LAYER 4	0.9044		
CHANGE IN WATER STORAGE	-0.056	-204.276	-0.17
SOIL WATER AT START OF YEAR	433.564	1573838.750	
SOIL WATER AT END OF YEAR	433.508	1573634.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.149	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	0.57	0.88	1.01	2.22	1.75	5.70
	3.64	2.13	8.00	2.39	3.64	0.59
STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
RUNOFF						
TOTALS	0.204	0.212	0.411	1.351	0.629	4.054
	1.560	1.037	5.638	1.304	2.496	0.401
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	0.358	0.476	0.952	0.786	1.146	1.714
	2.091	1.096	2.268	0.862	1.475	0.055
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

LATERAL DRAINAGE RECIRCULATED INTO LAYER 1

TOTALS	0.0052	0.0047	0.0051	0.0048	0.0049	0.0047
	0.0048	0.0047	0.0045	0.0045	0.0043	0.0044
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

LATERAL DRAINAGE COLLECTED FROM LAYER 3

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

LATERAL DRAINAGE RECIRCULATED FROM LAYER 3

TOTALS	0.0052	0.0047	0.0051	0.0048	0.0049	0.0047
	0.0048	0.0047	0.0045	0.0045	0.0043	0.0044
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 5

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES	0.9847	0.9697	0.9551	0.9399	0.9249	0.9101
	0.8955	0.8810	0.8676	0.8544	0.8414	0.8287
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 1

	INCHES	CU. FEET	PERCENT

	AELIVC			
PRECIPITATION	32.52	(0.000)	118047.6	100.00
RUNOFF	19.297	(0.0000)	70047.62	59.338
EVAPOTRANSPIRATION	13.279	(0.0000)	48203.36	40.834
DRAINAGE RECIRCULATED INTO LAYER 1	0.05668	(0.00000)	205.755	0.17430
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.00000	(0.00000)	0.000	0.00000
DRAINAGE RECIRCULATED FROM LAYER 3	0.05668	(0.00000)	205.755	0.17430
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.00029	(0.00000)	1.043	0.00088
AVERAGE HEAD ON TOP OF LAYER 4	0.904	(0.000)		
CHANGE IN WATER STORAGE	-0.056	(0.0000)	-204.28	-0.173

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 1

	(INCHES)	(CU. FT.)
PRECIPITATION	1.97	7151.100
RUNOFF	1.654	6002.2090
DRAINAGE RECIRCULATED INTO LAYER 1	0.00020	0.73708
DRAINAGE COLLECTED FROM LAYER 3	0.00000	0.00000
DRAINAGE RECIRCULATED FROM LAYER 3	0.00017	0.61889
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.000001	0.00311
AVERAGE HEAD ON TOP OF LAYER 4	0.993	
MAXIMUM HEAD ON TOP OF LAYER 4	1.767	
LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN)	36.2 FEET	
SNOW WATER	0.57	2070.2432

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2660
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1970

*** Maximum heads are computed using McEnroe's equations. ***

AELIVC

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(INCHES)	(VOL/VOL)
1	1.7203	0.2867
2	419.7000	0.2915
3	1.8399	0.1533
4	0.0000	0.0000
5	10.2480	0.4270
SNOW WATER	0.000	

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Lateral Expansion HELP Model Results

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 4.0 BETA (2018)
DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Title: AEL Lateral Expansion **Simulated On:** 11/29/2022 8:42

Layer 1

Type 1 - Vertical Percolation Layer (Cover Soil)
SiCL - Silty Clay Loam (Moderate)
Material Texture Number 26

Thickness	=	6	inches
Porosity	=	0.445	vol/vol
Field Capacity	=	0.393	vol/vol
Wilting Point	=	0.277	vol/vol
Initial Soil Water Content	=	0.3567	vol/vol
Effective Sat. Hyd. Conductivity	=	1.90E-06	cm/sec

Note: 100% of drainage collected from Layer 3 is recirculated into this layer.

Layer 2

Type 1 - Vertical Percolation Layer (Waste)
Municipal Solid Waste (MSW) (900 pcy)
Material Texture Number 18

Thickness	=	240	inches
Porosity	=	0.671	vol/vol
Field Capacity	=	0.292	vol/vol
Wilting Point	=	0.077	vol/vol
Initial Soil Water Content	=	0.2888	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-03	cm/sec

Layer 3

Type 2 - Lateral Drainage Layer
LFS Loamy Fine Sand
Material Texture Number 5

Thickness	=	12	inches
Porosity	=	0.457	vol/vol
Field Capacity	=	0.131	vol/vol
Wilting Point	=	0.058	vol/vol
Initial Soil Water Content	=	0.1742	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-03	cm/sec
Slope	=	0.5	%
Drainage Length	=	250	ft

Note: 100% of drainage collected from this layer is recirculated into Layer 1.

Layer 4

Type 4 - Flexible Membrane Liner

HDPE Membrane

Material Texture Number 35

Thickness	=	0.06	inches
Effective Sat. Hyd. Conductivity	=	2.00E-13	cm/sec
FML Pinhole Density	=	0.5	Holes/Acre
FML Installation Defects	=	1	Holes/Acre
FML Placement Quality	=	3	Good

Layer 5

Type 3 - Barrier Soil Liner

Liner Soil (High)

Material Texture Number 16

Thickness	=	24	inches
Porosity	=	0.427	vol/vol
Field Capacity	=	0.418	vol/vol
Wilting Point	=	0.367	vol/vol
Initial Soil Water Content	=	0.427	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-07	cm/sec

Note: Initial moisture content of the layers and snow water were computed as nearly steady-state values by HELP.

General Design and Evaporative Zone Data

SCS Runoff Curve Number	=	97.1	
Fraction of Area Allowing Runoff	=	30	%
Area projected on a horizontal plane	=	1	acres
Evaporative Zone Depth	=	10	inches
Initial Water in Evaporative Zone	=	2.531	inches
Upper Limit of Evaporative Storage	=	5.354	inches
Lower Limit of Evaporative Storage	=	1.97	inches
Initial Snow Water	=	0	inches
Initial Water in Layer Materials	=	83.781	inches
Total Initial Water	=	83.781	inches
Total Subsurface Inflow	=	0	inches/year

Note: SCS Runoff Curve Number was calculated by HELP.

Evapotranspiration and Weather Data

Station Latitude	=	36.15	Degrees

Maximum Leaf Area Index	=	1	
Start of Growing Season (Julian Date)	=	74	days
End of Growing Season (Julian Date)	=	319	days
Average Wind Speed	=	10	mph
Average 1st Quarter Relative Humidity	=	63	%
Average 2nd Quarter Relative Humidity	=	66	%
Average 3rd Quarter Relative Humidity	=	69	%
Average 4th Quarter Relative Humidity	=	63	%

Note: Evapotranspiration data was obtained for Sand Springs, Oklahoma

Normal Mean Monthly Precipitation (inches)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
1.360443	1.630784	3.351263	4.428939	4.601378	4.538602
3.993826	2.841239	3.475277	2.797522	2.323377	1.91907

Note: Precipitation was simulated based on HELP V4 weather simulation for:
Lat/Long: 36.15/-96.2

Normal Mean Monthly Temperature (Degrees Fahrenheit)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
44	49	51.8	67	77.1	85.5
91.2	88.2	80.8	71.7	57.6	45.3

Note: Temperature was simulated based on HELP V4 weather simulation for:
Lat/Long: 36.15/-96.2
Solar radiation was simulated based on HELP V4 weather simulation for:
Lat/Long: 36.15/-96.2

Daily Output for Year 1

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 8:42

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.039	0.2493	1.5900	0.0002	1.32E-06
2	*		0.00	0.000	0.040	0.2452	1.5894	0.0002	1.32E-06
3	*		0.00	0.000	0.000	0.2453	1.5889	0.0002	1.32E-06
4	*		0.00	0.000	0.000	0.2453	1.5883	0.0002	1.32E-06
5	*		0.00	0.000	0.000	0.2453	1.5877	0.0002	1.32E-06
6	*		0.00	0.000	0.000	0.2453	1.5872	0.0002	1.32E-06
7			0.11	0.000	0.082	0.2477	1.5866	0.0002	1.32E-06
8			0.08	0.000	0.120	0.2437	1.5861	0.0002	1.32E-06
9			0.28	0.034	0.120	0.2519	1.5855	0.0002	1.32E-06
10			0.10	0.000	0.107	0.2563	1.5850	0.0002	1.32E-06
11			0.03	0.000	0.110	0.2488	1.5844	0.0002	1.32E-06
12			0.03	0.000	0.078	0.2444	1.5839	0.0002	1.32E-06
13			0.00	0.000	0.116	0.2329	1.5833	0.0002	1.32E-06
14			0.00	0.000	0.111	0.2218	1.5827	0.0002	1.32E-06
15			0.00	0.000	0.118	0.2100	1.5822	0.0002	1.31E-06
16			0.00	0.000	0.118	0.1982	1.5816	0.0002	1.31E-06
17			0.00	0.000	0.006	0.1976	1.5811	0.0002	1.31E-06
18			0.03	0.000	0.016	0.1995	1.5805	0.0002	1.31E-06
19	*		0.16	0.000	0.051	0.2015	1.5800	0.0002	1.31E-06
20			0.03	0.000	0.082	0.2048	1.5794	0.0002	1.31E-06
21			0.00	0.000	0.026	0.2023	1.5789	0.0002	1.31E-06
22			0.00	0.000	0.028	0.1995	1.5783	0.0002	1.31E-06
23			0.02	0.000	0.018	0.1995	1.5778	0.0002	1.31E-06
24			0.10	0.000	0.010	0.2090	1.5772	0.0002	1.31E-06

25		0.00	0.000	0.013	0.2077	1.5767	0.0002	1.31E-06
26		0.00	0.000	0.016	0.2061	1.5761	0.0002	1.31E-06
27	*	0.00	0.000	0.017	0.2044	1.5756	0.0002	1.31E-06
28		0.00	0.000	0.016	0.2028	1.5750	0.0002	1.31E-06
29		0.00	0.000	0.015	0.2013	1.5745	0.0002	1.31E-06
30		0.00	0.000	0.015	0.1998	1.5739	0.0002	1.31E-06
31	*	0.00	0.000	0.000	0.1998	1.5734	0.0002	1.31E-06
32	*	0.00	0.000	0.000	0.1999	1.5728	0.0002	1.31E-06
33	*	0.00	0.000	0.000	0.1999	1.5723	0.0002	1.31E-06
34	*	0.00	0.000	0.000	0.1999	1.5717	0.0002	1.31E-06
35	*	0.00	0.000	0.000	0.1999	1.5712	0.0002	1.31E-06
36	*	0.00	0.000	0.000	0.1999	1.5706	0.0002	1.31E-06
37	*	0.00	0.000	0.000	0.1999	1.5701	0.0002	1.31E-06
38	*	0.00	0.000	0.000	0.2000	1.5695	0.0002	1.31E-06
39	*	0.00	0.000	0.015	0.1985	1.5690	0.0002	1.30E-06
40	*	0.00	0.000	0.012	0.1974	1.5684	0.0002	1.30E-06
41		0.00	0.000	0.004	0.1970	1.5679	0.0002	1.30E-06
42	*	0.00	0.000	0.000	0.1970	1.5673	0.0002	1.30E-06
43		0.00	0.000	0.000	0.1970	1.5668	0.0002	1.30E-06
44		0.00	0.000	0.000	0.1970	1.5662	0.0002	1.30E-06
45		0.14	0.001	0.012	0.2098	1.5657	0.0002	1.30E-06
46		0.00	0.000	0.010	0.2092	1.5651	0.0002	1.30E-06
47		0.00	0.000	0.010	0.2082	1.5646	0.0002	1.30E-06
48		0.00	0.000	0.011	0.2071	1.5640	0.0002	1.30E-06
49		0.00	0.000	0.010	0.2061	1.5635	0.0002	1.30E-06
50		0.00	0.000	0.010	0.2051	1.5629	0.0002	1.30E-06
51	*	0.00	0.000	0.010	0.2042	1.5624	0.0002	1.30E-06
52		0.00	0.000	0.010	0.2032	1.5618	0.0002	1.30E-06
53		0.02	0.000	0.014	0.2034	1.5613	0.0002	1.30E-06
54		0.00	0.000	0.011	0.2026	1.5607	0.0002	1.30E-06
55		0.06	0.000	0.014	0.2071	1.5602	0.0002	1.30E-06
56		0.00	0.000	0.011	0.2060	1.5596	0.0002	1.30E-06

57		0.00	0.000	0.011	0.2050	1.5591	0.0002	1.30E-06
58		0.00	0.000	0.009	0.2041	1.5586	0.0002	1.30E-06
59	*	0.00	0.000	0.000	0.2041	1.5580	0.0002	1.30E-06
60	*	0.00	0.000	0.008	0.2033	1.5575	0.0002	1.30E-06
61	*	0.00	0.000	0.008	0.2025	1.5569	0.0002	1.30E-06
62	*	0.00	0.000	0.008	0.2017	1.5564	0.0002	1.30E-06
63	*	0.00	0.000	0.013	0.2009	1.5558	0.0002	1.29E-06
64	*	0.04	0.000	0.045	0.2001	1.5553	0.0002	1.29E-06
65		0.00	0.000	0.008	0.1994	1.5547	0.0002	1.29E-06
66		0.00	0.000	0.008	0.1986	1.5542	0.0002	1.29E-06
67		1.67	0.665	0.016	0.2145	1.5537	0.0002	1.29E-06
68		0.00	0.129	0.285	0.2262	1.5531	0.0002	1.29E-06
69		0.00	0.000	0.266	0.2298	1.5526	0.0002	1.29E-06
70		0.00	0.000	0.069	0.2229	1.5520	0.0002	1.29E-06
71		0.38	0.049	0.134	0.2366	1.5515	0.0002	1.29E-06
72		1.05	0.413	0.087	0.2482	1.5509	0.0002	1.29E-06
73		0.00	0.075	0.133	0.2599	1.5504	0.0002	1.29E-06
74	*	0.00	0.006	0.037	0.2715	1.5499	0.0002	1.29E-06
75		0.00	0.000	0.079	0.2651	1.5493	0.0002	1.29E-06
76		0.03	0.000	0.109	0.2569	1.5488	0.0002	1.29E-06
77		1.82	0.766	0.072	0.2698	1.5482	0.0002	1.29E-06
78		0.67	0.469	0.116	0.2814	1.5477	0.0002	1.29E-06
79		0.00	0.171	0.135	0.2930	1.5471	0.0002	1.29E-06
80		0.00	0.059	0.085	0.3047	1.5466	0.0002	1.29E-06
81		0.39	0.102	0.248	0.3163	1.5461	0.0002	1.29E-06
82		0.43	0.132	0.142	0.3279	1.5455	0.0002	1.29E-06
83	*	0.00	0.000	0.087	0.3293	1.5450	0.0002	1.29E-06
84	*	0.23	0.000	0.039	0.3313	1.5444	0.0002	1.29E-06
85		0.00	0.007	0.111	0.3370	1.5439	0.0002	1.29E-06
86		0.48	0.144	0.071	0.3492	1.5434	0.0002	1.29E-06
87		0.00	0.000	0.240	0.3401	1.5428	0.0002	1.28E-06
88		0.00	0.000	0.104	0.3296	1.5423	0.0002	1.28E-06

89	*	0.01	0.000	0.065	0.3238	1.5417	0.0002	1.28E-06
90		0.12	0.000	0.103	0.3248	1.5447	0.0002	1.29E-06
91		0.00	0.000	0.211	0.3037	1.5688	0.0002	1.30E-06
92		0.00	0.000	0.099	0.2938	1.5682	0.0002	1.30E-06
93	*	0.25	0.000	0.043	0.2958	1.5677	0.0002	1.30E-06
94		0.00	0.000	0.095	0.3051	1.5671	0.0002	1.30E-06
95		0.10	0.000	0.115	0.3038	1.5666	0.0002	1.30E-06
96		0.19	0.013	0.198	0.2990	1.5660	0.0002	1.30E-06
97		0.87	0.295	0.112	0.3107	1.5655	0.0002	1.30E-06
98		0.02	0.030	0.170	0.3223	1.5649	0.0002	1.30E-06
99		0.00	0.000	0.190	0.3103	1.5644	0.0002	1.30E-06
100		0.00	0.000	0.267	0.2837	1.5638	0.0002	1.30E-06
101		0.30	0.033	0.270	0.2773	1.5633	0.0002	1.30E-06
102		0.00	0.000	0.181	0.2651	1.5627	0.0002	1.30E-06
103	*	0.10	0.000	0.093	0.2663	1.5622	0.0002	1.30E-06
104		0.00	0.000	0.189	0.2474	1.5617	0.0002	1.30E-06
105		0.00	0.000	0.112	0.2362	1.5611	0.0002	1.30E-06
106		0.00	0.000	0.080	0.2282	1.5606	0.0002	1.30E-06
107		0.00	0.000	0.059	0.2216	1.5600	0.0002	1.30E-06
108		0.00	0.000	0.046	0.2170	1.5831	0.0002	1.32E-06
109		0.00	0.000	0.038	0.2102	1.6287	0.0002	1.35E-06
110		0.00	0.000	0.034	0.2068	1.6735	0.0002	1.38E-06
111		0.46	0.099	0.036	0.2229	1.6741	0.0002	1.38E-06
112		0.27	0.069	0.113	0.2345	1.6746	0.0002	1.39E-06
113		0.00	0.000	0.206	0.2282	1.6740	0.0002	1.38E-06
114		0.00	0.000	0.167	0.2082	1.7135	0.0002	1.41E-06
115		0.00	0.000	0.106	0.1977	1.7714	0.0002	1.46E-06
116		0.00	0.000	0.007	0.1970	1.7708	0.0002	1.46E-06
117		0.00	0.000	0.000	0.1970	1.7702	0.0002	1.46E-06
118		0.00	0.000	0.000	0.1970	1.7696	0.0002	1.46E-06
119	*	0.00	0.000	0.000	0.1970	1.7690	0.0002	1.46E-06
120		0.00	0.000	0.000	0.1970	1.7683	0.0002	1.46E-06

121	0.00	0.000	0.000	0.1970	1.7677	0.0002	1.46E-06
122	0.00	0.000	0.000	0.1970	1.7671	0.0002	1.46E-06
123	0.22	0.024	0.016	0.2094	1.7665	0.0002	1.46E-06
124	0.00	0.000	0.063	0.2084	1.7659	0.0002	1.45E-06
125	0.00	0.000	0.018	0.2066	1.7652	0.0002	1.45E-06
126	0.00	0.000	0.016	0.2051	1.7646	0.0002	1.45E-06
127	0.00	0.000	0.015	0.2036	1.7640	0.0002	1.45E-06
128	0.00	0.000	0.015	0.2021	1.7634	0.0002	1.45E-06
129	0.00	0.000	0.015	0.2006	1.7628	0.0002	1.45E-06
130	0.41	0.081	0.024	0.2163	1.7621	0.0002	1.45E-06
131	0.00	0.000	0.167	0.2144	1.7615	0.0002	1.45E-06
132	0.04	0.000	0.020	0.2167	1.7609	0.0002	1.45E-06
133	0.00	0.000	0.071	0.2096	1.7603	0.0002	1.45E-06
134	0.47	0.110	0.022	0.2241	1.7597	0.0002	1.45E-06
135	0.67	0.256	0.092	0.2357	1.7591	0.0002	1.45E-06
136	0.84	0.343	0.304	0.2474	1.7584	0.0002	1.45E-06
137	0.00	0.058	0.160	0.2590	1.7578	0.0002	1.45E-06
138	0.00	0.000	0.114	0.2611	1.7572	0.0002	1.45E-06
139	0.00	0.000	0.221	0.2390	1.7566	0.0002	1.45E-06
140	0.00	0.000	0.154	0.2236	1.7560	0.0002	1.45E-06
141	0.00	0.000	0.171	0.2065	1.7554	0.0002	1.45E-06
142	0.38	0.043	0.239	0.2105	1.7548	0.0002	1.45E-06
143	0.00	0.000	0.141	0.2025	1.7541	0.0002	1.45E-06
144	0.00	0.000	0.034	0.1991	1.7535	0.0002	1.45E-06
145	0.00	0.000	0.018	0.1973	1.7529	0.0002	1.44E-06
146	0.00	0.000	0.003	0.1970	1.7523	0.0002	1.44E-06
147	0.00	0.000	0.000	0.1970	1.7517	0.0002	1.44E-06
148	0.33	0.051	0.044	0.2107	1.7511	0.0002	1.44E-06
149	0.00	0.000	0.109	0.2092	1.7505	0.0002	1.44E-06
150	0.00	0.000	0.022	0.2070	1.7498	0.0002	1.44E-06
151	0.03	0.000	0.027	0.2075	1.7492	0.0002	1.44E-06
152	0.20	0.023	0.025	0.2183	1.7486	0.0002	1.44E-06

153	0.04	0.000	0.158	0.2112	1.7480	0.0002	1.44E-06
154	0.00	0.000	0.019	0.2092	1.7474	0.0002	1.44E-06
155	0.00	0.000	0.021	0.2071	1.7468	0.0002	1.44E-06
156	0.00	0.000	0.018	0.2053	1.7462	0.0002	1.44E-06
157	0.00	0.000	0.019	0.2035	1.7456	0.0002	1.44E-06
158	0.00	0.000	0.019	0.2016	1.7449	0.0002	1.44E-06
159	0.00	0.000	0.021	0.1995	1.7443	0.0002	1.44E-06
160	0.00	0.000	0.022	0.1973	1.7437	0.0002	1.44E-06
161	0.00	0.000	0.003	0.1970	1.7431	0.0002	1.44E-06
162	0.54	0.133	0.026	0.2130	1.7425	0.0002	1.44E-06
163	0.00	0.000	0.295	0.2052	1.7419	0.0002	1.44E-06
164	0.00	0.000	0.015	0.2037	1.7413	0.0002	1.44E-06
165	1.29	0.480	0.027	0.2188	1.7407	0.0002	1.44E-06
166	0.00	0.047	0.359	0.2305	1.7401	0.0002	1.44E-06
167	0.00	0.000	0.294	0.2121	1.7395	0.0002	1.43E-06
168	0.00	0.000	0.123	0.1998	1.7389	0.0002	1.43E-06
169	0.06	0.000	0.045	0.2014	1.7383	0.0002	1.43E-06
170	0.90	0.273	0.150	0.2132	1.7377	0.0002	1.43E-06
171	0.00	0.015	0.192	0.2249	1.7371	0.0002	1.43E-06
172	0.00	0.000	0.095	0.2190	1.7365	0.0002	1.43E-06
173	0.00	0.000	0.191	0.1999	1.7358	0.0002	1.43E-06
174	0.00	0.000	0.029	0.1974	1.7352	0.0002	1.43E-06
175	0.39	0.047	0.138	0.2108	1.7346	0.0002	1.43E-06
176	0.00	0.000	0.124	0.2051	1.7340	0.0002	1.43E-06
177	0.00	0.000	0.044	0.2007	1.7334	0.0002	1.43E-06
178	0.76	0.225	0.054	0.2164	1.7328	0.0002	1.43E-06
179	0.02	0.000	0.246	0.2269	1.7322	0.0002	1.43E-06
180	0.00	0.000	0.115	0.2154	1.7316	0.0002	1.43E-06
181	0.05	0.000	0.141	0.2064	1.7310	0.0002	1.43E-06
182	0.04	0.000	0.086	0.2016	1.7304	0.0002	1.43E-06
183	0.06	0.000	0.024	0.2052	1.7298	0.0002	1.43E-06
184	0.00	0.000	0.052	0.2000	1.7292	0.0002	1.43E-06

185	1.74	0.683	0.072	0.2150	1.7286	0.0002	1.43E-06
186	0.66	0.335	0.428	0.2266	1.7280	0.0002	1.43E-06
187	0.15	0.069	0.420	0.2383	1.7274	0.0002	1.43E-06
188	0.01	0.000	0.341	0.2206	1.7269	0.0002	1.43E-06
189	0.69	0.115	0.352	0.2335	1.7267	0.0002	1.42E-06
190	0.00	0.000	0.278	0.2147	1.7260	0.0002	1.42E-06
191	0.00	0.000	0.161	0.1987	1.7254	0.0002	1.42E-06
192	0.00	0.000	0.008	0.1978	1.7248	0.0002	1.42E-06
193	0.24	0.028	0.072	0.2058	1.7242	0.0002	1.42E-06
194	0.00	0.000	0.115	0.2003	1.7236	0.0002	1.42E-06
195	0.00	0.000	0.026	0.1977	1.7230	0.0002	1.42E-06
196	0.00	0.000	0.007	0.1970	1.7224	0.0002	1.42E-06
197	0.00	0.000	0.000	0.1970	1.7218	0.0002	1.42E-06
198	0.00	0.000	0.000	0.1970	1.7212	0.0002	1.42E-06
199	0.00	0.000	0.000	0.1970	1.7206	0.0002	1.42E-06
200	0.00	0.000	0.000	0.1970	1.7200	0.0002	1.42E-06
201	0.00	0.000	0.000	0.1970	1.7194	0.0002	1.42E-06
202	0.00	0.000	0.000	0.1970	1.7188	0.0002	1.42E-06
203	0.00	0.000	0.000	0.1970	1.7182	0.0002	1.42E-06
204	0.00	0.000	0.000	0.1970	1.7176	0.0002	1.42E-06
205	0.00	0.000	0.000	0.1970	1.7170	0.0002	1.42E-06
206	0.00	0.000	0.000	0.1970	1.7164	0.0002	1.42E-06
207	0.00	0.000	0.000	0.1970	1.7158	0.0002	1.42E-06
208	0.26	0.036	0.028	0.2096	1.7152	0.0002	1.42E-06
209	0.98	0.349	0.100	0.2210	1.7146	0.0002	1.42E-06
210	0.00	0.031	0.267	0.2326	1.7140	0.0002	1.42E-06
211	0.00	0.000	0.226	0.2173	1.7134	0.0002	1.41E-06
212	0.50	0.057	0.262	0.2304	1.7128	0.0002	1.41E-06
213	0.20	0.025	0.116	0.2366	1.7122	0.0002	1.41E-06
214	0.00	0.000	0.115	0.2299	1.7116	0.0002	1.41E-06
215	0.00	0.000	0.207	0.2093	1.7110	0.0002	1.41E-06
216	0.00	0.000	0.097	0.1996	1.7104	0.0002	1.41E-06

217	0.03	0.000	0.032	0.1992	1.7098	0.0002	1.41E-06
218	0.17	0.009	0.078	0.2057	1.7092	0.0002	1.41E-06
219	0.00	0.000	0.055	0.2021	1.7086	0.0002	1.41E-06
220	0.00	0.000	0.038	0.1984	1.7080	0.0002	1.41E-06
221	0.00	0.000	0.011	0.1973	1.7074	0.0002	1.41E-06
222	0.12	0.000	0.013	0.2083	1.7068	0.0002	1.41E-06
223	0.01	0.000	0.020	0.2069	1.7062	0.0002	1.41E-06
224	0.00	0.000	0.021	0.2048	1.7056	0.0002	1.41E-06
225	0.00	0.000	0.022	0.2026	1.7050	0.0002	1.41E-06
226	0.00	0.000	0.022	0.2005	1.7044	0.0002	1.41E-06
227	0.00	0.000	0.022	0.1983	1.7038	0.0002	1.41E-06
228	0.00	0.000	0.011	0.1973	1.7032	0.0002	1.41E-06
229	0.00	0.000	0.003	0.1970	1.7026	0.0002	1.41E-06
230	0.00	0.000	0.000	0.1970	1.7020	0.0002	1.41E-06
231	0.00	0.000	0.000	0.1970	1.7014	0.0002	1.41E-06
232	0.00	0.000	0.000	0.1970	1.7008	0.0002	1.41E-06
233	0.00	0.000	0.000	0.1970	1.7002	0.0002	1.40E-06
234	0.00	0.000	0.000	0.1970	1.6997	0.0002	1.40E-06
235	0.00	0.000	0.000	0.1970	1.6991	0.0002	1.40E-06
236	0.07	0.000	0.010	0.2033	1.6985	0.0002	1.40E-06
237	0.00	0.000	0.016	0.2018	1.6979	0.0002	1.40E-06
238	0.00	0.000	0.021	0.1996	1.6973	0.0002	1.40E-06
239	0.00	0.000	0.009	0.1987	1.6967	0.0002	1.40E-06
240	0.00	0.000	0.009	0.1979	1.6961	0.0002	1.40E-06
241	0.00	0.000	0.005	0.1974	1.6955	0.0002	1.40E-06
242	0.00	0.000	0.003	0.1971	1.6949	0.0002	1.40E-06
243	0.00	0.000	0.001	0.1970	1.6943	0.0002	1.40E-06
244	0.23	0.027	0.016	0.2097	1.6937	0.0002	1.40E-06
245	0.00	0.000	0.072	0.2082	1.6931	0.0002	1.40E-06
246	0.00	0.000	0.022	0.2060	1.6925	0.0002	1.40E-06
247	0.00	0.000	0.022	0.2039	1.6919	0.0002	1.40E-06
248	0.00	0.000	0.018	0.2022	1.6913	0.0002	1.40E-06

249	0.07	0.000	0.028	0.2068	1.6907	0.0002	1.40E-06
250	0.14	0.002	0.027	0.2170	1.6902	0.0002	1.40E-06
251	0.44	0.114	0.030	0.2281	1.6896	0.0002	1.40E-06
252	1.50	0.610	0.289	0.2397	1.6890	0.0002	1.40E-06
253	0.99	0.542	0.185	0.2514	1.6884	0.0002	1.40E-06
254	0.00	0.110	0.338	0.2630	1.6878	0.0002	1.40E-06
255	0.35	0.066	0.445	0.2683	1.6872	0.0002	1.39E-06
256	0.51	0.149	0.146	0.2800	1.6866	0.0002	1.39E-06
257	0.00	0.000	0.138	0.2802	1.6860	0.0002	1.39E-06
258	0.00	0.000	0.089	0.2713	1.6854	0.0002	1.39E-06
259	0.00	0.000	0.167	0.2547	1.6848	0.0002	1.39E-06
260	0.00	0.000	0.176	0.2372	1.6842	0.0002	1.39E-06
261	1.04	0.295	0.255	0.2519	1.6836	0.0002	1.39E-06
262	0.69	0.233	0.322	0.2636	1.6831	0.0002	1.39E-06
263	0.00	0.008	0.215	0.2752	1.6825	0.0002	1.39E-06
264	0.00	0.000	0.294	0.2478	1.6819	0.0002	1.39E-06
265	0.00	0.000	0.151	0.2327	1.6813	0.0002	1.39E-06
266	0.00	0.000	0.110	0.2219	1.6807	0.0002	1.39E-06
267	1.21	0.420	0.093	0.2375	1.6801	0.0002	1.39E-06
268	0.24	0.144	0.200	0.2492	1.6795	0.0002	1.39E-06
269	0.00	0.002	0.204	0.2608	1.6789	0.0002	1.39E-06
270	0.00	0.000	0.311	0.2302	1.6783	0.0002	1.39E-06
271	0.00	0.000	0.199	0.2102	1.6778	0.0002	1.39E-06
272	0.00	0.000	0.126	0.1976	1.6781	0.0002	1.39E-06
273	0.17	0.007	0.043	0.2080	1.6778	0.0002	1.39E-06
274	0.03	0.000	0.099	0.2028	1.6772	0.0002	1.39E-06
275	0.87	0.251	0.159	0.2158	1.6766	0.0002	1.39E-06
276	0.15	0.048	0.205	0.2274	1.6760	0.0002	1.39E-06
277	0.00	0.000	0.177	0.2209	1.6754	0.0002	1.39E-06
278	1.42	0.505	0.231	0.2338	1.6749	0.0002	1.39E-06
279	0.00	0.066	0.222	0.2455	1.6743	0.0002	1.39E-06
280	0.00	0.000	0.179	0.2429	1.6737	0.0002	1.38E-06

281		0.00	0.000	0.075	0.2355	1.6731	0.0002	1.38E-06
282		0.00	0.000	0.086	0.2269	1.6725	0.0002	1.38E-06
283		0.00	0.000	0.109	0.2160	1.6719	0.0002	1.38E-06
284		0.00	0.000	0.128	0.2033	1.6713	0.0002	1.38E-06
285		0.15	0.000	0.093	0.2089	1.6708	0.0002	1.38E-06
286		0.00	0.000	0.084	0.2005	1.6702	0.0002	1.38E-06
287		0.00	0.000	0.026	0.1979	1.6696	0.0002	1.38E-06
288		0.00	0.000	0.009	0.1971	1.6690	0.0002	1.38E-06
289		0.00	0.000	0.001	0.1970	1.6684	0.0002	1.38E-06
290		1.26	0.455	0.054	0.2131	1.6678	0.0002	1.38E-06
291		0.20	0.153	0.172	0.2248	1.6672	0.0002	1.38E-06
292		0.00	0.009	0.206	0.2364	1.6667	0.0002	1.38E-06
293		0.00	0.000	0.177	0.2209	1.6661	0.0002	1.38E-06
294		0.00	0.000	0.110	0.2099	1.6655	0.0002	1.38E-06
295		0.00	0.000	0.067	0.2033	1.6649	0.0002	1.38E-06
296		0.00	0.000	0.053	0.1980	1.6643	0.0002	1.38E-06
297	*	0.00	0.000	0.005	0.1974	1.6639	0.0002	1.38E-06
298		0.00	0.000	0.002	0.1972	1.6637	0.0002	1.38E-06
299	*	0.00	0.000	0.002	0.1970	1.6632	0.0002	1.38E-06
300	*	0.00	0.000	0.000	0.1970	1.6626	0.0002	1.38E-06
301	*	0.14	0.000	0.022	0.1990	1.6620	0.0002	1.38E-06
302	*	0.04	0.000	0.000	0.2010	1.6614	0.0002	1.38E-06
303		0.90	0.364	0.000	0.2137	1.6608	0.0002	1.37E-06
304		0.79	0.404	0.085	0.2254	1.6602	0.0002	1.37E-06
305		0.01	0.156	0.082	0.2370	1.6597	0.0002	1.37E-06
306		0.10	0.076	0.100	0.2486	1.6591	0.0002	1.37E-06
307		0.00	0.000	0.157	0.2506	1.6585	0.0002	1.37E-06
308		0.00	0.000	0.176	0.2330	1.6579	0.0002	1.37E-06
309		0.00	0.000	0.093	0.2237	1.6573	0.0002	1.37E-06
310		0.00	0.000	0.092	0.2145	1.6568	0.0002	1.37E-06
311		0.00	0.000	0.107	0.2038	1.6562	0.0002	1.37E-06
312		0.00	0.000	0.061	0.1977	1.6556	0.0002	1.37E-06

313		0.00	0.000	0.005	0.1972	1.6550	0.0002	1.37E-06
314		0.00	0.000	0.002	0.1970	1.6544	0.0002	1.37E-06
315		0.24	0.031	0.033	0.2084	1.6539	0.0002	1.37E-06
316		0.05	0.000	0.088	0.2112	1.6533	0.0002	1.37E-06
317		1.01	0.354	0.046	0.2237	1.6527	0.0002	1.37E-06
318		0.00	0.045	0.215	0.2354	1.6521	0.0002	1.37E-06
319		0.10	0.000	0.137	0.2417	1.6515	0.0002	1.37E-06
320		0.53	0.147	0.072	0.2549	1.6510	0.0002	1.37E-06
321		0.00	0.000	0.130	0.2595	1.6504	0.0002	1.37E-06
322		0.00	0.000	0.065	0.2531	1.6498	0.0002	1.37E-06
323		0.00	0.000	0.091	0.2440	1.6492	0.0002	1.37E-06
324		0.00	0.000	0.084	0.2355	1.6487	0.0002	1.37E-06
325		0.00	0.000	0.095	0.2260	1.6481	0.0002	1.37E-06
326		0.00	0.000	0.169	0.2092	1.6475	0.0002	1.36E-06
327		0.00	0.000	0.102	0.1990	1.6469	0.0002	1.36E-06
328		0.00	0.000	0.010	0.1980	1.6464	0.0002	1.36E-06
329		0.00	0.000	0.010	0.1970	1.6458	0.0002	1.36E-06
330		0.00	0.000	0.000	0.1970	1.6452	0.0002	1.36E-06
331		0.80	0.241	0.044	0.2133	1.6446	0.0002	1.36E-06
332		0.00	0.012	0.193	0.2250	1.6441	0.0002	1.36E-06
333		0.00	0.000	0.107	0.2170	1.6435	0.0002	1.36E-06
334		0.00	0.000	0.073	0.2098	1.6429	0.0002	1.36E-06
335		0.00	0.000	0.048	0.2050	1.6423	0.0002	1.36E-06
336		0.00	0.000	0.052	0.1998	1.6418	0.0002	1.36E-06
337		0.00	0.000	0.027	0.1972	1.6412	0.0002	1.36E-06
338		0.00	0.000	0.001	0.1971	1.6406	0.0002	1.36E-06
339		0.00	0.000	0.001	0.1970	1.6400	0.0002	1.36E-06
340	*	0.20	0.000	0.036	0.1990	1.6395	0.0002	1.36E-06
341		0.00	0.000	0.053	0.2079	1.6389	0.0002	1.36E-06
342		0.00	0.000	0.031	0.2048	1.6383	0.0002	1.36E-06
343		0.00	0.000	0.057	0.1991	1.6377	0.0002	1.36E-06
344		0.01	0.000	0.023	0.1975	1.6372	0.0002	1.36E-06

345		0.01	0.000	0.014	0.1970	1.6366	0.0002	1.36E-06
346		0.16	0.004	0.025	0.2089	1.6360	0.0002	1.36E-06
347		0.00	0.000	0.025	0.2073	1.6355	0.0002	1.36E-06
348		0.00	0.000	0.022	0.2051	1.6349	0.0002	1.36E-06
349		0.00	0.000	0.020	0.2031	1.6343	0.0002	1.35E-06
350		0.00	0.000	0.019	0.2013	1.6337	0.0002	1.35E-06
351		0.00	0.000	0.017	0.1996	1.6332	0.0002	1.35E-06
352	*	0.49	0.000	0.023	0.2015	1.6326	0.0002	1.35E-06
353		0.88	0.504	0.000	0.2156	1.6320	0.0002	1.35E-06
354	*	0.00	0.000	0.031	0.2156	1.6315	0.0002	1.35E-06
355	*	0.00	0.000	0.015	0.2157	1.6309	0.0002	1.35E-06
356	*	0.01	0.137	0.043	0.2295	1.6303	0.0002	1.35E-06
357		0.00	0.040	0.071	0.2411	1.6297	0.0002	1.35E-06
358		0.00	0.000	0.126	0.2378	1.6292	0.0002	1.35E-06
359		0.00	0.000	0.068	0.2310	1.6286	0.0002	1.35E-06
360	*	0.21	0.000	0.040	0.2330	1.6280	0.0002	1.35E-06
361		0.00	0.000	0.077	0.2402	1.6275	0.0002	1.35E-06
362	*	0.00	0.000	0.040	0.2362	1.6269	0.0002	1.35E-06
363		0.66	0.189	0.095	0.2496	1.6263	0.0002	1.35E-06
364		0.00	0.012	0.083	0.2613	1.6257	0.0002	1.35E-06
365		0.00	0.000	0.112	0.2528	1.6252	0.0002	1.35E-06

* = Frozen (air or soil)

Annual Totals for Year 1			
	inches	cubic feet	percent
Precipitation	43.62	158,339.0	100.00
Runoff	14.639	53,138.5	33.56
Evapotranspiration	28.972	105,169.8	66.42
Recirculation into Layer 1	0.0686	249.0	0.16
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0686	249.0	0.16
Percolation/Leakage through Layer 5	0.000501	1.8185	0.00
Average Head on Top of Layer 4	1.6577	---	---
Change in Water Storage	0.0079	28.8	0.02
Soil Water at Start of Year	83.7814	304,126.3	192.07
Soil Water at End of Year	83.7893	304,155.1	192.09
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0686	-249.0	-0.16

Average Annual Totals Summary

Title: AEL Lateral Expansion
Simulated on: 11/29/2022 8:42

	Average Annual Totals for Years 1 - 1*			
	(inches)	[std dev]	(cubic feet)	(percent)
Precipitation	43.62	[0]	158,339.0	100.00
Runoff	14.639	[0]	53,138.5	33.56
Evapotranspiration	28.972	[0]	105,169.8	66.42
Subprofile1				
Recirculation into Layer 1	0.0686	[0]	249.0	0.16
Lateral drainage collected from Layer 3	0.0000	[0]	0.0000	0.00
Drainage recirculated from Layer 3	0.0686	[0]	249.0	0.16
Percolation/leakage through Layer 5	0.000501	[0]	1.8185	0.00
Average Head on Top of Layer 4	1.6577		---	---
Water storage				
Change in water storage	0.0079		28.8	0.02

* Note: Average inches are converted to volume based on the user-specified area.

Peak Values Summary

Title: AEL Lateral Expansion
Simulated on: 11/29/2022 8:42

	Peak Values for Years 1 - 1*		
	(inches)		(cubic feet)
Precipitation	1.82		6,601.4
Runoff	0.766		2,779.8
Subprofile1			
Drainage Recirculated into Layer 1	0.0002		0.7291
Drainage collected from Layer 3	0.0000		0.0000
Drainage recirculated from Layer 3	0.0002		0.7291
Percolation/leakage through Layer 5	0.000001		0.0053
Average head on Layer 4	1.7714		---
Maximum head on Layer 4	2.6312		---
Location of maximum head in Layer 3	64.32	(feet from drain)	
Other Parameters			
Snow water	0.6786		2,463.4
Maximum vegetation soil water	0.3492	(vol/vol)	
Minimum vegetation soil water	0.1970	(vol/vol)	

Final Water Storage in Landfill Profile at End of Simulation Period

Title: AEL Lateral Expansion
Simulated on: 11/29/2022 8:42
Simulation period: 1 years

	Final Water Storage	
Layer	(inches)	(vol/vol)
1	2.1370	0.3562
2	69.3027	0.2888
3	2.1017	0.1751
4	0.0000	0.0000
5	10.2480	0.4270
Snow water	0.0000	---

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 4.0 BETA (2018)
DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Title: AEL Lateral Expansion **Simulated On:** 11/29/2022 9:52

Layer 1

Type 1 - Vertical Percolation Layer (Cover Soil)
SiCL - Silty Clay Loam (Moderate)
Material Texture Number 26

Thickness	=	6	inches
Porosity	=	0.445	vol/vol
Field Capacity	=	0.393	vol/vol
Wilting Point	=	0.277	vol/vol
Initial Soil Water Content	=	0.2736	vol/vol
Effective Sat. Hyd. Conductivity	=	1.90E-06	cm/sec

Note: 100% of drainage collected from Layer 3 is recirculated into this layer.

Layer 2

Type 1 - Vertical Percolation Layer (Waste)
Municipal Solid Waste (MSW) (900 pcy)
Material Texture Number 18

Thickness	=	960	inches
Porosity	=	0.671	vol/vol
Field Capacity	=	0.292	vol/vol
Wilting Point	=	0.077	vol/vol
Initial Soil Water Content	=	0.2912	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-03	cm/sec

Layer 3

Type 2 - Lateral Drainage Layer
LFS Loamy Fine Sand
Material Texture Number 5

Thickness	=	12	inches
Porosity	=	0.457	vol/vol
Field Capacity	=	0.131	vol/vol
Wilting Point	=	0.058	vol/vol
Initial Soil Water Content	=	0.1455	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-03	cm/sec
Slope	=	0.5	%
Drainage Length	=	250	ft

Note: 100% of drainage collected from this layer is recirculated into Layer 1.

Layer 4

Type 4 - Flexible Membrane Liner

HDPE Membrane

Material Texture Number 35

Thickness	=	0.06	inches
Effective Sat. Hyd. Conductivity	=	2.00E-13	cm/sec
FML Pinhole Density	=	0.5	Holes/Acre
FML Installation Defects	=	1	Holes/Acre
FML Placement Quality	=	3	Good

Layer 5

Type 3 - Barrier Soil Liner

Liner Soil (High)

Material Texture Number 16

Thickness	=	24	inches
Porosity	=	0.427	vol/vol
Field Capacity	=	0.418	vol/vol
Wilting Point	=	0.367	vol/vol
Initial Soil Water Content	=	0.427	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-07	cm/sec

Note: Initial moisture content of the layers and snow water were computed as nearly steady-state values by HELP.

General Design and Evaporative Zone Data

SCS Runoff Curve Number	=	91.3	
Fraction of Area Allowing Runoff	=	50	%
Area projected on a horizontal plane	=	1	acres
Evaporative Zone Depth	=	10	inches
Initial Water in Evaporative Zone	=	2.029	inches
Upper Limit of Evaporative Storage	=	5.354	inches
Lower Limit of Evaporative Storage	=	1.97	inches
Initial Snow Water	=	0.336473	inches
Initial Water in Layer Materials	=	293.176	inches
Total Initial Water	=	293.512	inches
Total Subsurface Inflow	=	0	inches/year

Note: SCS Runoff Curve Number was calculated by HELP.

Evapotranspiration and Weather Data

Station Latitude	=	36.15	Degrees

Maximum Leaf Area Index	=	1	
Start of Growing Season (Julian Date)	=	74	days
End of Growing Season (Julian Date)	=	319	days
Average Wind Speed	=	10	mph
Average 1st Quarter Relative Humidity	=	63	%
Average 2nd Quarter Relative Humidity	=	66	%
Average 3rd Quarter Relative Humidity	=	69	%
Average 4th Quarter Relative Humidity	=	63	%

Note: Evapotranspiration data was obtained for Sand Springs, Oklahoma

Normal Mean Monthly Precipitation (inches)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
1.468211	1.918381	3.381085	4.035513	4.605293	4.860243
3.293734	2.881958	3.652511	3.642077	2.361213	1.992999

Note: Precipitation was simulated based on HELP V4 weather simulation for:
Lat/Long: 36.15/-96.2

Normal Mean Monthly Temperature (Degrees Fahrenheit)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
43.4	43.7	56.7	66.7	78.1	87.7
90.7	89.2	81.7	70.8	57.2	48.8

Note: Temperature was simulated based on HELP V4 weather simulation for:
Lat/Long: 36.15/-96.2
Solar radiation was simulated based on HELP V4 weather simulation for:
Lat/Long: 36.15/-96.2

Daily Output for Year 1

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.048	0.113	0.2157	0.5348	0.0001	4.87E-07
2			0.00	0.000	0.055	0.2150	0.5346	0.0001	4.87E-07
3			0.00	0.000	0.010	0.2140	0.5344	0.0001	4.86E-07
4			0.00	0.000	0.010	0.2131	0.5342	0.0001	4.86E-07
5			0.00	0.000	0.010	0.2121	0.5340	0.0001	4.86E-07
6			0.00	0.000	0.009	0.2112	0.5338	0.0001	4.86E-07
7			0.00	0.000	0.009	0.2103	0.5336	0.0001	4.86E-07
8			0.00	0.000	0.009	0.2094	0.5335	0.0001	4.86E-07
9			0.00	0.000	0.009	0.2085	0.5333	0.0001	4.85E-07
10			0.00	0.000	0.009	0.2076	0.5331	0.0001	4.85E-07
11			0.00	0.000	0.009	0.2068	0.5329	0.0001	4.85E-07
12			0.00	0.000	0.008	0.2059	0.5327	0.0001	4.85E-07
13	*		0.00	0.000	0.008	0.2051	0.5325	0.0001	4.85E-07
14	*		0.00	0.000	0.000	0.2051	0.5323	0.0001	4.85E-07
15	*		0.00	0.000	0.000	0.2051	0.5321	0.0001	4.84E-07
16	*		0.00	0.000	0.000	0.2051	0.5320	0.0001	4.84E-07
17	*		0.00	0.000	0.008	0.2043	0.5318	0.0001	4.84E-07
18			0.00	0.000	0.008	0.2035	0.5316	0.0001	4.84E-07
19			0.00	0.000	0.008	0.2027	0.5314	0.0001	4.84E-07
20			0.00	0.000	0.008	0.2019	0.5312	0.0001	4.84E-07
21			0.00	0.000	0.008	0.2012	0.5310	0.0001	4.84E-07
22			0.00	0.000	0.008	0.2004	0.5308	0.0001	4.83E-07
23			0.00	0.000	0.006	0.1998	0.5307	0.0001	4.83E-07
24			0.00	0.000	0.009	0.1989	0.5305	0.0001	4.83E-07

25		0.00	0.000	0.009	0.1980	0.5303	0.0001	4.83E-07
26		0.00	0.000	0.009	0.1971	0.5301	0.0001	4.83E-07
27		0.00	0.000	0.001	0.1970	0.5299	0.0001	4.83E-07
28		0.01	0.000	0.006	0.1977	0.5297	0.0001	4.82E-07
29		0.00	0.000	0.001	0.1976	0.5295	0.0001	4.82E-07
30		0.00	0.000	0.005	0.1975	0.5294	0.0001	4.82E-07
31		0.00	0.000	0.001	0.1974	0.5292	0.0001	4.82E-07
32		0.00	0.000	0.002	0.1973	0.5290	0.0001	4.82E-07
33		0.00	0.000	0.002	0.1971	0.5288	0.0001	4.82E-07
34		0.00	0.000	0.001	0.1970	0.5286	0.0001	4.82E-07
35		0.00	0.000	0.000	0.1970	0.5284	0.0001	4.81E-07
36		0.00	0.000	0.000	0.1970	0.5282	0.0001	4.81E-07
37		0.32	0.080	0.016	0.2116	0.5281	0.0001	4.81E-07
38		0.00	0.000	0.084	0.2112	0.5279	0.0001	4.81E-07
39		0.00	0.000	0.006	0.2106	0.5277	0.0001	4.81E-07
40		0.02	0.000	0.012	0.2114	0.5275	0.0001	4.81E-07
41		0.00	0.000	0.006	0.2108	0.5273	0.0001	4.80E-07
42		0.00	0.000	0.008	0.2100	0.5271	0.0001	4.80E-07
43		0.00	0.000	0.007	0.2094	0.5269	0.0001	4.80E-07
44	*	0.02	0.000	0.030	0.2087	0.5268	0.0001	4.80E-07
45	*	0.00	0.000	0.000	0.2087	0.5266	0.0001	4.80E-07
46	*	0.00	0.000	0.000	0.2087	0.5264	0.0001	4.80E-07
47	*	0.00	0.000	0.000	0.2088	0.5262	0.0001	4.80E-07
48	*	0.00	0.000	0.000	0.2088	0.5260	0.0001	4.79E-07
49	*	0.13	0.000	0.028	0.2107	0.5258	0.0001	4.79E-07
50	*	0.07	0.000	0.000	0.2127	0.5257	0.0001	4.79E-07
51		0.37	0.146	0.085	0.2254	0.5255	0.0001	4.79E-07
52		0.07	0.003	0.091	0.2371	0.5253	0.0001	4.79E-07
53		0.53	0.123	0.187	0.2487	0.5251	0.0001	4.79E-07
54		0.00	0.000	0.105	0.2486	0.5250	0.0001	4.79E-07
55		0.00	0.000	0.064	0.2422	0.5248	0.0001	4.78E-07
56		0.00	0.000	0.113	0.2309	0.5246	0.0001	4.78E-07

57	*	0.00	0.000	0.047	0.2262	0.5245	0.0001	4.78E-07
58	*	0.00	0.000	0.000	0.2262	0.5243	0.0001	4.78E-07
59		0.26	0.045	0.080	0.2353	0.5241	0.0001	4.78E-07
60		0.00	0.000	0.200	0.2197	0.5239	0.0001	4.78E-07
61		0.00	0.000	0.074	0.2123	0.5237	0.0001	4.77E-07
62		0.00	0.000	0.133	0.1990	0.5238	0.0001	4.78E-07
63		0.00	0.000	0.015	0.1976	0.5238	0.0001	4.78E-07
64		0.00	0.000	0.006	0.1970	0.5237	0.0001	4.77E-07
65		0.00	0.000	0.000	0.1970	0.5235	0.0001	4.77E-07
66		0.31	0.066	0.044	0.2107	0.5233	0.0001	4.77E-07
67		0.28	0.061	0.105	0.2223	0.5231	0.0001	4.77E-07
68		0.00	0.000	0.114	0.2171	0.5229	0.0001	4.77E-07
69	*	0.17	0.000	0.088	0.2191	0.5227	0.0001	4.77E-07
70		0.12	0.000	0.087	0.2293	0.5226	0.0001	4.77E-07
71		0.00	0.000	0.098	0.2195	0.5224	0.0001	4.76E-07
72		0.00	0.000	0.176	0.2019	0.5222	0.0001	4.76E-07
73		0.10	0.000	0.055	0.2068	0.5220	0.0001	4.76E-07
74		0.53	0.164	0.064	0.2202	0.5218	0.0001	4.76E-07
75		0.00	0.000	0.172	0.2194	0.5217	0.0001	4.76E-07
76		0.00	0.000	0.083	0.2111	0.5215	0.0001	4.76E-07
77		0.06	0.000	0.102	0.2064	0.5213	0.0001	4.75E-07
78		0.29	0.047	0.064	0.2191	0.5211	0.0001	4.75E-07
79		0.00	0.000	0.126	0.2111	0.5209	0.0001	4.75E-07
80	*	0.36	0.000	0.038	0.2131	0.5207	0.0001	4.75E-07
81		0.02	0.069	0.063	0.2259	0.5206	0.0001	4.75E-07
82		0.00	0.000	0.146	0.2182	0.5204	0.0001	4.75E-07
83		0.15	0.001	0.134	0.2198	0.5202	0.0001	4.75E-07
84		0.10	0.000	0.158	0.2137	0.5200	0.0001	4.74E-07
85		0.00	0.000	0.088	0.2049	0.5198	0.0001	4.74E-07
86		0.00	0.000	0.039	0.2010	0.5196	0.0001	4.74E-07
87		0.03	0.000	0.035	0.2001	0.5195	0.0001	4.74E-07
88		0.00	0.000	0.016	0.1984	0.5193	0.0001	4.74E-07

89	0.00	0.000	0.006	0.1978	0.5191	0.0001	4.74E-07
90	0.00	0.000	0.005	0.1973	0.5189	0.0001	4.73E-07
91	0.04	0.000	0.010	0.2000	0.5187	0.0001	4.73E-07
92	0.07	0.000	0.009	0.2060	0.5186	0.0001	4.73E-07
93	0.00	0.000	0.011	0.2050	0.5184	0.0001	4.73E-07
94	0.00	0.000	0.014	0.2035	0.5182	0.0001	4.73E-07
95	0.00	0.000	0.015	0.2021	0.5180	0.0001	4.73E-07
96	0.00	0.000	0.014	0.2007	0.5178	0.0001	4.73E-07
97	0.04	0.000	0.020	0.2025	0.5176	0.0001	4.72E-07
98	0.00	0.000	0.013	0.2012	0.5175	0.0001	4.72E-07
99	0.00	0.000	0.011	0.2001	0.5173	0.0001	4.72E-07
100	0.00	0.000	0.011	0.1990	0.5171	0.0001	4.72E-07
101	0.05	0.000	0.010	0.2027	0.5169	0.0001	4.72E-07
102	0.00	0.000	0.008	0.2019	0.5167	0.0001	4.72E-07
103	0.14	0.001	0.014	0.2139	0.5166	0.0001	4.72E-07
104	0.00	0.000	0.008	0.2132	0.5164	0.0001	4.71E-07
105	0.08	0.000	0.017	0.2193	0.5162	0.0001	4.71E-07
106	0.29	0.069	0.022	0.2326	0.5160	0.0001	4.71E-07
107	0.10	0.000	0.087	0.2402	0.5158	0.0001	4.71E-07
108	0.00	0.000	0.011	0.2391	0.5157	0.0001	4.71E-07
109	0.00	0.000	0.013	0.2378	0.5155	0.0001	4.71E-07
110	0.00	0.000	0.012	0.2366	0.5153	0.0001	4.70E-07
111	0.03	0.000	0.018	0.2381	0.5151	0.0001	4.70E-07
112	0.00	0.000	0.012	0.2369	0.5149	0.0001	4.70E-07
113	0.00	0.000	0.014	0.2355	0.5148	0.0001	4.70E-07
114	0.01	0.000	0.018	0.2349	0.5146	0.0001	4.70E-07
115	0.17	0.016	0.019	0.2470	0.5145	0.0001	4.70E-07
116	0.00	0.000	0.113	0.2372	0.5144	0.0001	4.70E-07
117	0.00	0.000	0.014	0.2359	0.5143	0.0001	4.70E-07
118	0.04	0.000	0.021	0.2377	0.5141	0.0001	4.69E-07
119	0.00	0.000	0.016	0.2362	0.5139	0.0001	4.69E-07
120	0.00	0.000	0.013	0.2348	0.5137	0.0001	4.69E-07

121	0.25	0.047	0.022	0.2484	0.5135	0.0001	4.69E-07
122	0.08	0.000	0.283	0.2332	0.5134	0.0001	4.69E-07
123	0.00	0.000	0.016	0.2316	0.5132	0.0001	4.69E-07
124	0.00	0.000	0.019	0.2300	0.5130	0.0001	4.69E-07
125	0.19	0.023	0.019	0.2428	0.5128	0.0001	4.68E-07
126	0.00	0.000	0.235	0.2216	0.5127	0.0001	4.68E-07
127	0.30	0.071	0.021	0.2353	0.5125	0.0001	4.68E-07
128	1.41	0.730	0.123	0.2469	0.5123	0.0001	4.68E-07
129	0.07	0.159	0.151	0.2586	0.5121	0.0001	4.68E-07
130	0.43	0.147	0.207	0.2702	0.5120	0.0001	4.68E-07
131	0.33	0.079	0.194	0.2818	0.5118	0.0001	4.68E-07
132	0.73	0.355	0.128	0.2934	0.5116	0.0001	4.67E-07
133	1.11	0.703	0.098	0.3051	0.5114	0.0001	4.67E-07
134	0.43	0.279	0.200	0.3167	0.5113	0.0001	4.67E-07
135	0.00	0.000	0.332	0.3047	0.5111	0.0001	4.67E-07
136	0.00	0.000	0.145	0.2902	0.5109	0.0001	4.67E-07
137	0.06	0.000	0.157	0.2808	0.5107	0.0001	4.67E-07
138	0.01	0.000	0.144	0.2675	0.5105	0.0001	4.66E-07
139	0.74	0.219	0.171	0.2822	0.5104	0.0001	4.66E-07
140	0.01	0.000	0.309	0.2728	0.5102	0.0001	4.66E-07
141	0.00	0.000	0.221	0.2507	0.5100	0.0001	4.66E-07
142	0.00	0.000	0.143	0.2364	0.5098	0.0001	4.66E-07
143	0.00	0.000	0.124	0.2240	0.5096	0.0001	4.66E-07
144	0.00	0.000	0.168	0.2072	0.5095	0.0001	4.66E-07
145	0.01	0.000	0.068	0.1983	0.5549	0.0001	5.03E-07
146	0.18	0.018	0.045	0.2083	0.5940	0.0001	5.36E-07
147	0.00	0.000	0.050	0.2054	0.5938	0.0001	5.36E-07
148	0.34	0.071	0.055	0.2201	0.5936	0.0001	5.35E-07
149	0.28	0.030	0.247	0.2242	0.5934	0.0001	5.35E-07
150	0.13	0.000	0.144	0.2256	0.5932	0.0001	5.35E-07
151	0.26	0.028	0.208	0.2255	0.5930	0.0001	5.35E-07
152	0.00	0.000	0.199	0.2085	0.5928	0.0001	5.35E-07

153	0.00	0.000	0.071	0.2014	0.5925	0.0001	5.35E-07
154	0.00	0.000	0.033	0.1981	0.5923	0.0001	5.34E-07
155	0.00	0.000	0.006	0.1975	0.5921	0.0001	5.34E-07
156	0.00	0.000	0.003	0.1973	0.5919	0.0001	5.34E-07
157	0.00	0.000	0.003	0.1970	0.5917	0.0001	5.34E-07
158	0.00	0.000	0.000	0.1970	0.5915	0.0001	5.34E-07
159	0.00	0.000	0.000	0.1970	0.5913	0.0001	5.34E-07
160	0.30	0.063	0.036	0.2102	0.5911	0.0001	5.33E-07
161	0.02	0.000	0.084	0.2106	0.5909	0.0001	5.33E-07
162	0.00	0.000	0.020	0.2086	0.5907	0.0001	5.33E-07
163	0.00	0.000	0.017	0.2069	0.5905	0.0001	5.33E-07
164	0.00	0.000	0.020	0.2049	0.5903	0.0001	5.33E-07
165	0.32	0.070	0.030	0.2196	0.5901	0.0001	5.33E-07
166	0.00	0.000	0.160	0.2107	0.5899	0.0001	5.32E-07
167	0.12	0.000	0.029	0.2202	0.5896	0.0001	5.32E-07
168	0.00	0.000	0.024	0.2178	0.5894	0.0001	5.32E-07
169	0.03	0.000	0.026	0.2179	0.5892	0.0001	5.32E-07
170	0.00	0.000	0.019	0.2160	0.5890	0.0001	5.32E-07
171	0.70	0.279	0.030	0.2293	0.5888	0.0001	5.31E-07
172	0.04	0.000	0.365	0.2234	0.5886	0.0001	5.31E-07
173	1.56	0.660	0.342	0.2352	0.5884	0.0001	5.31E-07
174	0.51	0.325	0.198	0.2469	0.5882	0.0001	5.31E-07
175	1.21	0.717	0.213	0.2585	0.5880	0.0001	5.31E-07
176	0.05	0.002	0.408	0.2701	0.5878	0.0001	5.31E-07
177	0.01	0.000	0.143	0.2566	0.5876	0.0001	5.30E-07
178	0.22	0.027	0.279	0.2450	0.5874	0.0001	5.30E-07
179	0.15	0.008	0.132	0.2478	0.5872	0.0001	5.30E-07
180	0.00	0.000	0.202	0.2284	0.5870	0.0001	5.30E-07
181	0.00	0.000	0.260	0.2024	0.5868	0.0001	5.30E-07
182	0.00	0.000	0.043	0.1981	0.5866	0.0001	5.30E-07
183	0.00	0.000	0.011	0.1970	0.5863	0.0001	5.29E-07
184	0.00	0.000	0.000	0.1970	0.5861	0.0001	5.29E-07

185	0.00	0.000	0.000	0.1970	0.5859	0.0001	5.29E-07
186	0.00	0.000	0.000	0.1970	0.5857	0.0001	5.29E-07
187	0.00	0.000	0.000	0.1970	0.5855	0.0001	5.29E-07
188	0.11	0.000	0.011	0.2071	0.5853	0.0001	5.29E-07
189	0.00	0.000	0.016	0.2055	0.5851	0.0001	5.28E-07
190	0.00	0.000	0.021	0.2034	0.5849	0.0001	5.28E-07
191	0.00	0.000	0.024	0.2010	0.5847	0.0001	5.28E-07
192	0.00	0.000	0.021	0.1990	0.5845	0.0001	5.28E-07
193	0.00	0.000	0.017	0.1973	0.5843	0.0001	5.28E-07
194	0.00	0.000	0.003	0.1970	0.5841	0.0001	5.28E-07
195	1.07	0.468	0.033	0.2128	0.5839	0.0001	5.27E-07
196	0.03	0.061	0.207	0.2244	0.5837	0.0001	5.27E-07
197	0.00	0.000	0.196	0.2110	0.5835	0.0001	5.27E-07
198	0.00	0.000	0.119	0.1991	0.5833	0.0001	5.27E-07
199	0.00	0.000	0.021	0.1970	0.5831	0.0001	5.27E-07
200	0.11	0.000	0.019	0.2066	0.5829	0.0001	5.27E-07
201	0.36	0.078	0.073	0.2193	0.5827	0.0001	5.26E-07
202	0.04	0.000	0.114	0.2199	0.5825	0.0001	5.26E-07
203	0.00	0.000	0.098	0.2100	0.5823	0.0001	5.26E-07
204	0.13	0.000	0.110	0.2119	0.5820	0.0001	5.26E-07
205	0.04	0.000	0.058	0.2101	0.5818	0.0001	5.26E-07
206	0.00	0.000	0.027	0.2074	0.5816	0.0001	5.26E-07
207	0.00	0.000	0.035	0.2040	0.5814	0.0001	5.25E-07
208	2.09	1.110	0.047	0.2187	0.5812	0.0001	5.25E-07
209	0.00	0.197	0.279	0.2304	0.5810	0.0001	5.25E-07
210	0.00	0.000	0.215	0.2286	0.5808	0.0001	5.25E-07
211	0.00	0.000	0.220	0.2066	0.5806	0.0001	5.25E-07
212	0.00	0.000	0.086	0.1979	0.5804	0.0001	5.25E-07
213	0.00	0.000	0.005	0.1974	0.5802	0.0001	5.24E-07
214	0.00	0.000	0.002	0.1972	0.5800	0.0001	5.24E-07
215	0.00	0.000	0.002	0.1970	0.5798	0.0001	5.24E-07
216	0.28	0.050	0.060	0.2092	0.5796	0.0001	5.24E-07

217	0.00	0.000	0.074	0.2069	0.5794	0.0001	5.24E-07
218	0.00	0.000	0.036	0.2033	0.5792	0.0001	5.24E-07
219	0.00	0.000	0.038	0.1995	0.5790	0.0001	5.23E-07
220	0.00	0.000	0.017	0.1979	0.5788	0.0001	5.23E-07
221	0.00	0.000	0.009	0.1970	0.5786	0.0001	5.23E-07
222	0.44	0.122	0.044	0.2124	0.5784	0.0001	5.23E-07
223	0.00	0.000	0.141	0.2105	0.5782	0.0001	5.23E-07
224	0.00	0.000	0.023	0.2082	0.5780	0.0001	5.23E-07
225	0.01	0.000	0.033	0.2055	0.5778	0.0001	5.22E-07
226	0.00	0.000	0.026	0.2029	0.5776	0.0001	5.22E-07
227	0.00	0.000	0.034	0.1995	0.5774	0.0001	5.22E-07
228	0.00	0.000	0.019	0.1976	0.5772	0.0001	5.22E-07
229	0.06	0.000	0.019	0.2012	0.5770	0.0001	5.22E-07
230	0.07	0.000	0.015	0.2065	0.5768	0.0001	5.22E-07
231	0.00	0.000	0.018	0.2047	0.5766	0.0001	5.21E-07
232	0.00	0.000	0.024	0.2023	0.5764	0.0001	5.21E-07
233	0.00	0.000	0.026	0.1997	0.5762	0.0001	5.21E-07
234	0.00	0.000	0.017	0.1979	0.5760	0.0001	5.21E-07
235	0.00	0.000	0.008	0.1971	0.5758	0.0001	5.21E-07
236	0.00	0.000	0.001	0.1970	0.5756	0.0001	5.21E-07
237	0.00	0.000	0.000	0.1970	0.5754	0.0001	5.20E-07
238	0.09	0.000	0.011	0.2046	0.5752	0.0001	5.20E-07
239	0.00	0.000	0.016	0.2031	0.5750	0.0001	5.20E-07
240	0.01	0.000	0.020	0.2018	0.5747	0.0001	5.20E-07
241	0.00	0.000	0.023	0.1995	0.5745	0.0001	5.20E-07
242	0.00	0.000	0.011	0.1984	0.5743	0.0001	5.20E-07
243	0.00	0.000	0.009	0.1975	0.5741	0.0001	5.19E-07
244	0.00	0.000	0.004	0.1971	0.5739	0.0001	5.19E-07
245	0.00	0.000	0.001	0.1970	0.5737	0.0001	5.19E-07
246	0.00	0.000	0.000	0.1970	0.5735	0.0001	5.19E-07
247	0.00	0.000	0.000	0.1970	0.5733	0.0001	5.19E-07
248	0.00	0.000	0.000	0.1970	0.5731	0.0001	5.19E-07

249		0.00	0.000	0.000	0.1970	0.5729	0.0001	5.18E-07
250		0.00	0.000	0.000	0.1970	0.5727	0.0001	5.18E-07
251		0.00	0.000	0.000	0.1970	0.5725	0.0001	5.18E-07
252		0.00	0.000	0.000	0.1970	0.5723	0.0001	5.18E-07
253		0.00	0.000	0.000	0.1970	0.5721	0.0001	5.18E-07
254		0.00	0.000	0.000	0.1970	0.5719	0.0001	5.18E-07
255		0.00	0.000	0.000	0.1970	0.5717	0.0001	5.17E-07
256		0.09	0.000	0.011	0.2052	0.5715	0.0001	5.17E-07
257		0.00	0.000	0.007	0.2045	0.5713	0.0001	5.17E-07
258		0.04	0.000	0.018	0.2063	0.5711	0.0001	5.17E-07
259		0.00	0.000	0.010	0.2052	0.5709	0.0001	5.17E-07
260		0.00	0.000	0.009	0.2043	0.5707	0.0001	5.17E-07
261		0.00	0.000	0.011	0.2032	0.5705	0.0001	5.16E-07
262		0.79	0.321	0.028	0.2171	0.5703	0.0001	5.16E-07
263		0.00	0.000	0.313	0.2162	0.5701	0.0001	5.16E-07
264		0.00	0.000	0.095	0.2067	0.5699	0.0001	5.16E-07
265		0.00	0.000	0.059	0.2008	0.5697	0.0001	5.16E-07
266		0.00	0.000	0.038	0.1970	0.5695	0.0001	5.16E-07
267	*	0.00	0.000	0.000	0.1970	0.5693	0.0001	5.15E-07
268	*	0.01	0.000	0.015	0.1970	0.5691	0.0001	5.15E-07
269	*	0.12	0.000	0.086	0.1990	0.5689	0.0001	5.15E-07
270		0.26	0.033	0.116	0.2081	0.5687	0.0001	5.15E-07
271		0.00	0.000	0.110	0.2004	0.5685	0.0001	5.15E-07
272		0.00	0.000	0.025	0.1979	0.5683	0.0001	5.15E-07
273		0.00	0.000	0.009	0.1971	0.5681	0.0001	5.14E-07
274		0.00	0.000	0.001	0.1970	0.5679	0.0001	5.14E-07
275		0.00	0.000	0.000	0.1970	0.5677	0.0001	5.14E-07
276		0.00	0.000	0.000	0.1970	0.5675	0.0001	5.14E-07
277		0.00	0.000	0.000	0.1970	0.5673	0.0001	5.14E-07
278		0.42	0.112	0.038	0.2131	0.5671	0.0001	5.14E-07
279		0.05	0.000	0.169	0.2121	0.5669	0.0001	5.13E-07
280		0.52	0.178	0.038	0.2250	0.5667	0.0001	5.13E-07

281		0.00	0.000	0.138	0.2289	0.5665	0.0001	5.13E-07
282	*	0.01	0.000	0.040	0.2257	0.5663	0.0001	5.13E-07
283		0.07	0.000	0.060	0.2271	0.5661	0.0001	5.13E-07
284		0.00	0.000	0.090	0.2181	0.5660	0.0001	5.13E-07
285		0.00	0.000	0.143	0.2038	0.5658	0.0001	5.12E-07
286		0.00	0.000	0.054	0.1984	0.5656	0.0001	5.12E-07
287		0.00	0.000	0.007	0.1977	0.5654	0.0001	5.12E-07
288		0.00	0.000	0.004	0.1974	0.5652	0.0001	5.12E-07
289		0.00	0.000	0.004	0.1970	0.5650	0.0001	5.12E-07
290		0.00	0.000	0.000	0.1970	0.5648	0.0001	5.12E-07
291		0.00	0.000	0.000	0.1970	0.5646	0.0001	5.11E-07
292		0.00	0.000	0.000	0.1970	0.5644	0.0001	5.11E-07
293		0.00	0.000	0.000	0.1970	0.5642	0.0001	5.11E-07
294		0.00	0.000	0.000	0.1970	0.5640	0.0001	5.11E-07
295		0.00	0.000	0.000	0.1970	0.5638	0.0001	5.11E-07
296		0.00	0.000	0.000	0.1970	0.5636	0.0001	5.11E-07
297		0.38	0.098	0.032	0.2128	0.5634	0.0001	5.10E-07
298		0.53	0.225	0.066	0.2244	0.5632	0.0001	5.10E-07
299		0.00	0.000	0.177	0.2290	0.5630	0.0001	5.10E-07
300		0.00	0.000	0.078	0.2214	0.5628	0.0001	5.10E-07
301		0.00	0.000	0.111	0.2103	0.5626	0.0001	5.10E-07
302		0.00	0.000	0.114	0.1989	0.5624	0.0001	5.10E-07
303		0.00	0.000	0.015	0.1974	0.5622	0.0001	5.09E-07
304		0.00	0.000	0.002	0.1972	0.5620	0.0001	5.09E-07
305		0.00	0.000	0.002	0.1970	0.5618	0.0001	5.09E-07
306	*	0.00	0.000	0.000	0.1970	0.5616	0.0001	5.09E-07
307		0.72	0.257	0.048	0.2133	0.5614	0.0001	5.09E-07
308	*	0.00	0.000	0.030	0.2133	0.5612	0.0001	5.09E-07
309	*	1.01	0.000	0.021	0.2248	0.5610	0.0001	5.08E-07
310		0.38	0.468	0.000	0.2371	0.5608	0.0001	5.08E-07
311		0.08	0.472	0.001	0.2487	0.5606	0.0001	5.08E-07
312		0.00	0.037	0.180	0.2603	0.5604	0.0001	5.08E-07

313		0.00	0.000	0.081	0.2560	0.5602	0.0001	5.08E-07
314		0.01	0.000	0.129	0.2443	0.5600	0.0001	5.08E-07
315		0.07	0.000	0.121	0.2390	0.5598	0.0001	5.08E-07
316		0.07	0.000	0.093	0.2362	0.5596	0.0001	5.07E-07
317		0.12	0.000	0.091	0.2389	0.5594	0.0001	5.07E-07
318		0.00	0.000	0.064	0.2325	0.5594	0.0001	5.07E-07
319		0.00	0.000	0.131	0.2194	0.5593	0.0001	5.07E-07
320		0.09	0.000	0.063	0.2218	0.5591	0.0001	5.07E-07
321		0.00	0.000	0.087	0.2131	0.5589	0.0001	5.07E-07
322		0.00	0.000	0.094	0.2037	0.5588	0.0001	5.07E-07
323		0.00	0.000	0.060	0.1977	0.5586	0.0001	5.06E-07
324	*	0.00	0.000	0.006	0.1972	0.5587	0.0001	5.07E-07
325		0.29	0.051	0.067	0.2098	0.5587	0.0001	5.07E-07
326		0.49	0.142	0.140	0.2214	0.5585	0.0001	5.06E-07
327		0.00	0.000	0.118	0.2237	0.5583	0.0001	5.06E-07
328		0.01	0.000	0.041	0.2206	0.5596	0.0001	5.07E-07
329	*	0.00	0.000	0.001	0.2206	0.5603	0.0001	5.08E-07
330		0.03	0.000	0.065	0.2168	0.5601	0.0001	5.08E-07
331		0.00	0.000	0.066	0.2103	0.5599	0.0001	5.08E-07
332		0.03	0.000	0.062	0.2072	0.5597	0.0001	5.07E-07
333		0.17	0.011	0.057	0.2160	0.5595	0.0001	5.07E-07
334		0.00	0.000	0.049	0.2122	0.5593	0.0001	5.07E-07
335	*	0.00	0.000	0.000	0.2123	0.5591	0.0001	5.07E-07
336	*	0.00	0.000	0.028	0.2094	0.5589	0.0001	5.07E-07
337		0.00	0.000	0.057	0.2037	0.5587	0.0001	5.07E-07
338		0.00	0.000	0.053	0.1984	0.5585	0.0001	5.06E-07
339		0.00	0.000	0.014	0.1970	0.5583	0.0001	5.06E-07
340		0.00	0.000	0.000	0.1970	0.5581	0.0001	5.06E-07
341		0.00	0.000	0.000	0.1970	0.5579	0.0001	5.06E-07
342		0.00	0.000	0.000	0.1970	0.5577	0.0001	5.06E-07
343		0.00	0.000	0.000	0.1970	0.5575	0.0001	5.06E-07
344		0.00	0.000	0.000	0.1970	0.5574	0.0001	5.05E-07

345		0.00	0.000	0.000	0.1970	0.5572	0.0001	5.05E-07
346		0.00	0.000	0.000	0.1970	0.5570	0.0001	5.05E-07
347		0.00	0.000	0.000	0.1970	0.5568	0.0001	5.05E-07
348		0.00	0.000	0.000	0.1970	0.5566	0.0001	5.05E-07
349		0.00	0.000	0.000	0.1970	0.5564	0.0001	5.05E-07
350		0.00	0.000	0.000	0.1970	0.5562	0.0001	5.04E-07
351	*	0.00	0.000	0.000	0.1970	0.5560	0.0001	5.04E-07
352		0.00	0.000	0.000	0.1970	0.5558	0.0001	5.04E-07
353		0.00	0.000	0.000	0.1970	0.5556	0.0001	5.04E-07
354		0.00	0.000	0.000	0.1970	0.5554	0.0001	5.04E-07
355		0.00	0.000	0.000	0.1970	0.5552	0.0001	5.04E-07
356		0.00	0.000	0.000	0.1970	0.5550	0.0001	5.04E-07
357		0.00	0.000	0.000	0.1970	0.5548	0.0001	5.03E-07
358		0.00	0.000	0.000	0.1970	0.5546	0.0001	5.03E-07
359		0.00	0.000	0.000	0.1970	0.5544	0.0001	5.03E-07
360	*	0.00	0.000	0.000	0.1970	0.5542	0.0001	5.03E-07
361	*	0.00	0.000	0.000	0.1970	0.5540	0.0001	5.03E-07
362	*	0.00	0.000	0.000	0.1970	0.5538	0.0001	5.03E-07
363	*	0.20	0.000	0.030	0.1990	0.5537	0.0001	5.02E-07
364	*	0.30	0.000	0.028	0.2010	0.5535	0.0001	5.02E-07
365	*	0.00	0.000	0.040	0.2029	0.5533	0.0001	5.02E-07

* = Frozen (air or soil)

Annual Totals for Year 1			
	inches	cubic feet	percent
Precipitation	30.28	109,914.3	100.00
Runoff	10.539	38,258.0	34.81
Evapotranspiration	19.734	71,634.0	65.17
Recirculation into Layer 1	0.0229	83.0	0.08
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0229	83.0	0.08
Percolation/Leakage through Layer 5	0.000183	0.6642	0.00
Average Head on Top of Layer 4	0.5524	---	---
Change in Water Storage	0.0060	21.7	0.02
Soil Water at Start of Year	293.1757	1,064,227.9	968.23
Soil Water at End of Year	293.1817	1,064,249.6	968.25
Snow Water at Start of Year	0.3365	1,221.4	1.11
Snow Water at End of Year	0.3365	1,221.4	1.11
Annual Water Budget Balance	-0.0229	-83.0	-0.08

Daily Output for Year 2

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.093	0.023	0.2157	0.5531	0.0001	5.02E-07
2			0.00	0.000	0.070	0.2180	0.5529	0.0001	5.02E-07
3			0.00	0.000	0.010	0.2170	0.5527	0.0001	5.02E-07
4			0.00	0.000	0.010	0.2160	0.5525	0.0001	5.01E-07
5	*		0.00	0.000	0.000	0.2160	0.5523	0.0001	5.01E-07
6	*		0.00	0.000	0.000	0.2160	0.5521	0.0001	5.01E-07
7	*		0.00	0.000	0.000	0.2160	0.5519	0.0001	5.01E-07
8	*		0.00	0.000	0.000	0.2160	0.5517	0.0001	5.01E-07
9	*		0.68	0.000	0.030	0.2180	0.5515	0.0001	5.01E-07
10	*		0.03	0.000	0.027	0.2200	0.5513	0.0001	5.00E-07
11	*		0.06	0.000	0.000	0.2219	0.5511	0.0001	5.00E-07
12	*		0.00	0.000	0.020	0.2239	0.5509	0.0001	5.00E-07
13	*		0.00	0.000	0.035	0.2259	0.5507	0.0001	5.00E-07
14			0.00	0.200	0.037	0.2386	0.5506	0.0001	5.00E-07
15			0.00	0.000	0.101	0.2477	0.5504	0.0001	5.00E-07
16			0.00	0.000	0.054	0.2423	0.5502	0.0001	4.99E-07
17			0.00	0.000	0.055	0.2368	0.5500	0.0001	4.99E-07
18	*		0.00	0.000	0.000	0.2368	0.5498	0.0001	4.99E-07
19			0.00	0.000	0.068	0.2300	0.5496	0.0001	4.99E-07
20			0.00	0.000	0.081	0.2219	0.5494	0.0001	4.99E-07
21			0.00	0.000	0.096	0.2123	0.5492	0.0001	4.99E-07
22			0.00	0.000	0.145	0.1978	0.5490	0.0001	4.99E-07
23			0.00	0.000	0.004	0.1974	0.5488	0.0001	4.98E-07
24	*		0.00	0.000	0.000	0.1974	0.5486	0.0001	4.98E-07

25	*	*	0.00	0.000	0.000	0.1974	0.5484	0.0001	4.98E-07
26		*	0.05	0.000	0.009	0.2014	0.5482	0.0001	4.98E-07
27		*	0.00	0.000	0.000	0.2014	0.5481	0.0001	4.98E-07
28		*	0.01	0.000	0.004	0.2015	0.5479	0.0001	4.98E-07
29			0.09	0.000	0.018	0.2088	0.5477	0.0001	4.97E-07
30			0.00	0.000	0.020	0.2069	0.5475	0.0001	4.97E-07
31			0.09	0.000	0.031	0.2123	0.5473	0.0001	4.97E-07
32			0.00	0.000	0.017	0.2106	0.5471	0.0001	4.97E-07
33	*		0.00	0.000	0.020	0.2086	0.5469	0.0001	4.97E-07
34	*		0.01	0.000	0.033	0.2067	0.5467	0.0001	4.97E-07
35	*		0.00	0.000	0.000	0.2067	0.5465	0.0001	4.96E-07
36	*		0.00	0.000	0.000	0.2067	0.5463	0.0001	4.96E-07
37	*		0.00	0.000	0.000	0.2067	0.5461	0.0001	4.96E-07
38			0.00	0.000	0.017	0.2050	0.5459	0.0001	4.96E-07
39	*		0.00	0.000	0.000	0.2050	0.5458	0.0001	4.96E-07
40			0.00	0.000	0.016	0.2034	0.5456	0.0001	4.96E-07
41			0.00	0.000	0.015	0.2019	0.5454	0.0001	4.96E-07
42			0.49	0.153	0.030	0.2175	0.5452	0.0001	4.95E-07
43			1.30	0.686	0.114	0.2292	0.5450	0.0001	4.95E-07
44			0.00	0.139	0.146	0.2408	0.5448	0.0001	4.95E-07
45			0.00	0.000	0.151	0.2396	0.5446	0.0001	4.95E-07
46			0.32	0.034	0.135	0.2514	0.5444	0.0001	4.95E-07
47			0.00	0.000	0.114	0.2438	0.5443	0.0001	4.95E-07
48			0.15	0.005	0.114	0.2465	0.5441	0.0001	4.94E-07
49			0.00	0.000	0.249	0.2222	0.5439	0.0001	4.94E-07
50			0.00	0.000	0.125	0.2097	0.5437	0.0001	4.94E-07
51	*		0.01	0.000	0.057	0.2052	0.5435	0.0001	4.94E-07
52	*		0.00	0.000	0.000	0.2052	0.5433	0.0001	4.94E-07
53	*		0.00	0.000	0.060	0.1992	0.5431	0.0001	4.94E-07
54	*		0.00	0.000	0.000	0.1992	0.5429	0.0001	4.93E-07
55	*		0.00	0.000	0.000	0.1993	0.5428	0.0001	4.93E-07
56			0.54	0.123	0.131	0.2155	0.5426	0.0001	4.93E-07

57		0.00	0.000	0.120	0.2158	0.5424	0.0001	4.93E-07
58		0.00	0.000	0.060	0.2098	0.5422	0.0001	4.93E-07
59	*	0.00	0.000	0.000	0.2098	0.5420	0.0001	4.93E-07
60		0.00	0.000	0.079	0.2018	0.5431	0.0001	4.94E-07
61	*	0.00	0.000	0.000	0.2018	0.5437	0.0001	4.94E-07
62	*	0.00	0.000	0.000	0.2018	0.5435	0.0001	4.94E-07
63	*	0.18	0.000	0.054	0.2038	0.5433	0.0001	4.94E-07
64		0.31	0.087	0.105	0.2178	0.5431	0.0001	4.94E-07
65	*	0.04	0.000	0.087	0.2214	0.5429	0.0001	4.93E-07
66		0.00	0.000	0.075	0.2139	0.5427	0.0001	4.93E-07
67		0.00	0.000	0.036	0.2103	0.5425	0.0001	4.93E-07
68	*	0.00	0.000	0.057	0.2046	0.5423	0.0001	4.93E-07
69		0.01	0.000	0.051	0.2000	0.5421	0.0001	4.93E-07
70		0.00	0.000	0.030	0.1970	0.5420	0.0001	4.93E-07
71	*	0.00	0.000	0.001	0.1970	0.5418	0.0001	4.93E-07
72	*	0.08	0.000	0.047	0.1990	0.5416	0.0001	4.92E-07
73	*	0.59	0.000	0.000	0.2010	0.5414	0.0001	4.92E-07
74		0.82	0.706	0.000	0.2137	0.5412	0.0001	4.92E-07
75		0.00	0.074	0.309	0.2253	0.5410	0.0001	4.92E-07
76		0.00	0.000	0.114	0.2213	0.5408	0.0001	4.92E-07
77		0.57	0.154	0.133	0.2348	0.5406	0.0001	4.92E-07
78	*	0.31	0.000	0.037	0.2377	0.5404	0.0001	4.91E-07
79		0.00	0.059	0.076	0.2510	0.5402	0.0001	4.91E-07
80		0.01	0.000	0.119	0.2523	0.5401	0.0001	4.91E-07
81		0.00	0.000	0.077	0.2446	0.5399	0.0001	4.91E-07
82		0.00	0.000	0.107	0.2339	0.5397	0.0001	4.91E-07
83		0.05	0.000	0.210	0.2182	0.5395	0.0001	4.91E-07
84		0.17	0.013	0.146	0.2183	0.5393	0.0001	4.90E-07
85		0.38	0.042	0.192	0.2299	0.5391	0.0001	4.90E-07
86		0.00	0.000	0.228	0.2113	0.5389	0.0001	4.90E-07
87		0.00	0.000	0.111	0.2002	0.5392	0.0001	4.90E-07
88		0.00	0.000	0.028	0.1974	0.5392	0.0001	4.90E-07

89		0.01	0.000	0.009	0.1972	0.5391	0.0001	4.90E-07
90		0.71	0.243	0.067	0.2135	0.5389	0.0001	4.90E-07
91		0.00	0.000	0.178	0.2190	0.5387	0.0001	4.90E-07
92		0.00	0.000	0.056	0.2134	0.5385	0.0001	4.90E-07
93		0.00	0.000	0.112	0.2023	0.5383	0.0001	4.90E-07
94		0.00	0.000	0.037	0.1985	0.5381	0.0001	4.89E-07
95		0.00	0.000	0.015	0.1971	0.5379	0.0001	4.89E-07
96		0.00	0.000	0.000	0.1970	0.5377	0.0001	4.89E-07
97		0.00	0.000	0.000	0.1970	0.5375	0.0001	4.89E-07
98		0.54	0.163	0.053	0.2133	0.5374	0.0001	4.89E-07
99	*	0.05	0.011	0.033	0.2249	0.5372	0.0001	4.89E-07
100	*	0.00	0.000	0.054	0.2249	0.5370	0.0001	4.89E-07
101	*	0.00	0.000	0.000	0.2249	0.5368	0.0001	4.88E-07
102	*	0.00	0.000	0.066	0.2183	0.5366	0.0001	4.88E-07
103	*	0.03	0.000	0.092	0.2119	0.5364	0.0001	4.88E-07
104	*	0.00	0.000	0.005	0.2119	0.5362	0.0001	4.88E-07
105		0.00	0.000	0.060	0.2059	0.5360	0.0001	4.88E-07
106		0.00	0.000	0.071	0.1989	0.5359	0.0001	4.88E-07
107		0.00	0.000	0.017	0.1972	0.5357	0.0001	4.87E-07
108		0.00	0.000	0.001	0.1971	0.5355	0.0001	4.87E-07
109		0.00	0.000	0.001	0.1970	0.5353	0.0001	4.87E-07
110		0.00	0.000	0.000	0.1970	0.5351	0.0001	4.87E-07
111		0.00	0.000	0.000	0.1970	0.5349	0.0001	4.87E-07
112		0.13	0.000	0.011	0.2088	0.5347	0.0001	4.87E-07
113		0.00	0.000	0.012	0.2076	0.5345	0.0001	4.86E-07
114		0.00	0.000	0.014	0.2063	0.5344	0.0001	4.86E-07
115		0.00	0.000	0.016	0.2047	0.5342	0.0001	4.86E-07
116		0.00	0.000	0.016	0.2031	0.5340	0.0001	4.86E-07
117		0.57	0.193	0.031	0.2184	0.5338	0.0001	4.86E-07
118		0.00	0.000	0.214	0.2161	0.5336	0.0001	4.86E-07
119		0.00	0.000	0.118	0.2044	0.5334	0.0001	4.86E-07
120		0.00	0.000	0.057	0.1990	0.5332	0.0001	4.85E-07

121	0.61	0.190	0.067	0.2152	0.5330	0.0001	4.85E-07
122	0.00	0.000	0.278	0.2061	0.5329	0.0001	4.85E-07
123	0.00	0.000	0.031	0.2030	0.5327	0.0001	4.85E-07
124	0.00	0.000	0.023	0.2007	0.5325	0.0001	4.85E-07
125	0.00	0.000	0.028	0.1979	0.5323	0.0001	4.85E-07
126	0.00	0.000	0.009	0.1970	0.5321	0.0001	4.84E-07
127	0.01	0.000	0.009	0.1974	0.5319	0.0001	4.84E-07
128	0.12	0.000	0.011	0.2084	0.5317	0.0001	4.84E-07
129	0.09	0.000	0.019	0.2159	0.5316	0.0001	4.84E-07
130	0.87	0.380	0.032	0.2289	0.5314	0.0001	4.84E-07
131	1.50	0.759	0.477	0.2405	0.5312	0.0001	4.84E-07
132	0.05	0.000	0.423	0.2515	0.5310	0.0001	4.84E-07
133	0.00	0.000	0.164	0.2350	0.5308	0.0001	4.83E-07
134	0.00	0.000	0.307	0.2043	0.5306	0.0001	4.83E-07
135	0.50	0.041	0.292	0.2169	0.5304	0.0001	4.83E-07
136	0.00	0.000	0.207	0.2003	0.5302	0.0001	4.83E-07
137	0.00	0.000	0.021	0.1982	0.5301	0.0001	4.83E-07
138	0.25	0.049	0.046	0.2084	0.5299	0.0001	4.83E-07
139	0.03	0.000	0.077	0.2083	0.5297	0.0001	4.82E-07
140	0.30	0.062	0.047	0.2213	0.5295	0.0001	4.82E-07
141	0.37	0.061	0.192	0.2330	0.5293	0.0001	4.82E-07
142	0.01	0.000	0.299	0.2098	0.5291	0.0001	4.82E-07
143	0.00	0.000	0.113	0.1985	0.5289	0.0001	4.82E-07
144	0.00	0.000	0.012	0.1973	0.5288	0.0001	4.82E-07
145	0.00	0.000	0.001	0.1971	0.5286	0.0001	4.82E-07
146	0.00	0.000	0.001	0.1970	0.5284	0.0001	4.81E-07
147	0.00	0.000	0.000	0.1970	0.5282	0.0001	4.81E-07
148	0.00	0.000	0.000	0.1970	0.5280	0.0001	4.81E-07
149	0.12	0.000	0.012	0.2081	0.5278	0.0001	4.81E-07
150	0.00	0.000	0.012	0.2069	0.5277	0.0001	4.81E-07
151	0.36	0.095	0.036	0.2208	0.5275	0.0001	4.81E-07
152	0.05	0.000	0.117	0.2230	0.5273	0.0001	4.80E-07

153	0.99	0.459	0.034	0.2359	0.5271	0.0001	4.80E-07
154	0.00	0.000	0.268	0.2461	0.5269	0.0001	4.80E-07
155	0.06	0.000	0.082	0.2437	0.5267	0.0001	4.80E-07
156	0.00	0.000	0.181	0.2258	0.5265	0.0001	4.80E-07
157	0.00	0.000	0.167	0.2091	0.5264	0.0001	4.80E-07
158	0.17	0.005	0.163	0.2086	0.5262	0.0001	4.80E-07
159	0.01	0.000	0.087	0.2010	0.5262	0.0001	4.80E-07
160	0.17	0.008	0.082	0.2078	0.5267	0.0001	4.80E-07
161	0.46	0.066	0.225	0.2192	0.5265	0.0001	4.80E-07
162	0.03	0.000	0.100	0.2187	0.5292	0.0001	4.82E-07
163	0.10	0.000	0.062	0.2222	0.5308	0.0001	4.83E-07
164	0.00	0.000	0.096	0.2126	0.5306	0.0001	4.83E-07
165	0.11	0.000	0.137	0.2103	0.5304	0.0001	4.83E-07
166	0.03	0.000	0.103	0.2033	0.5302	0.0001	4.83E-07
167	0.09	0.000	0.044	0.2080	0.5300	0.0001	4.83E-07
168	0.02	0.000	0.041	0.2059	0.5299	0.0001	4.83E-07
169	0.68	0.251	0.056	0.2189	0.5297	0.0001	4.82E-07
170	0.00	0.000	0.194	0.2236	0.5295	0.0001	4.82E-07
171	0.00	0.000	0.118	0.2118	0.5293	0.0001	4.82E-07
172	0.10	0.000	0.108	0.2110	0.5291	0.0001	4.82E-07
173	0.27	0.032	0.152	0.2161	0.5289	0.0001	4.82E-07
174	0.48	0.022	0.483	0.2152	0.5287	0.0001	4.82E-07
175	0.07	0.000	0.195	0.2043	0.5286	0.0001	4.82E-07
176	0.20	0.026	0.096	0.2098	0.5284	0.0001	4.81E-07
177	0.00	0.000	0.129	0.1995	0.5282	0.0001	4.81E-07
178	0.00	0.000	0.019	0.1976	0.5280	0.0001	4.81E-07
179	1.54	0.739	0.056	0.2137	0.5278	0.0001	4.81E-07
180	0.00	0.000	0.470	0.2247	0.5276	0.0001	4.81E-07
181	0.00	0.000	0.096	0.2151	0.5274	0.0001	4.81E-07
182	0.00	0.000	0.109	0.2043	0.5273	0.0001	4.80E-07
183	0.00	0.000	0.058	0.1984	0.5271	0.0001	4.80E-07
184	0.04	0.000	0.035	0.1986	0.5269	0.0001	4.80E-07

185	0.00	0.000	0.009	0.1977	0.5267	0.0001	4.80E-07
186	0.00	0.000	0.005	0.1972	0.5265	0.0001	4.80E-07
187	0.00	0.000	0.001	0.1970	0.5263	0.0001	4.80E-07
188	0.00	0.000	0.000	0.1970	0.5262	0.0001	4.80E-07
189	0.00	0.000	0.000	0.1970	0.5260	0.0001	4.79E-07
190	0.00	0.000	0.000	0.1970	0.5258	0.0001	4.79E-07
191	0.00	0.000	0.001	0.1970	0.5256	0.0001	4.79E-07
192	0.00	0.000	0.000	0.1970	0.5254	0.0001	4.79E-07
193	0.00	0.000	0.000	0.1970	0.5252	0.0001	4.79E-07
194	0.05	0.000	0.011	0.2009	0.5250	0.0001	4.79E-07
195	0.00	0.000	0.002	0.2007	0.5249	0.0001	4.78E-07
196	0.00	0.000	0.011	0.1996	0.5247	0.0001	4.78E-07
197	0.00	0.000	0.007	0.1988	0.5245	0.0001	4.78E-07
198	0.00	0.000	0.005	0.1983	0.5243	0.0001	4.78E-07
199	0.00	0.000	0.004	0.1979	0.5241	0.0001	4.78E-07
200	0.00	0.000	0.004	0.1975	0.5239	0.0001	4.78E-07
201	0.00	0.000	0.004	0.1971	0.5238	0.0001	4.78E-07
202	0.00	0.000	0.001	0.1970	0.5236	0.0001	4.77E-07
203	0.00	0.000	0.000	0.1970	0.5234	0.0001	4.77E-07
204	0.00	0.000	0.002	0.1970	0.5232	0.0001	4.77E-07
205	0.32	0.076	0.026	0.2113	0.5230	0.0001	4.77E-07
206	0.02	0.000	0.092	0.2119	0.5228	0.0001	4.77E-07
207	0.00	0.000	0.015	0.2104	0.5227	0.0001	4.77E-07
208	0.00	0.000	0.013	0.2091	0.5225	0.0001	4.76E-07
209	0.04	0.000	0.021	0.2107	0.5223	0.0001	4.76E-07
210	0.00	0.000	0.012	0.2095	0.5221	0.0001	4.76E-07
211	0.00	0.000	0.009	0.2087	0.5219	0.0001	4.76E-07
212	0.02	0.000	0.019	0.2083	0.5217	0.0001	4.76E-07
213	0.01	0.000	0.017	0.2077	0.5216	0.0001	4.76E-07
214	0.00	0.000	0.012	0.2064	0.5214	0.0001	4.76E-07
215	0.00	0.000	0.012	0.2053	0.5212	0.0001	4.75E-07
216	0.00	0.000	0.011	0.2041	0.5210	0.0001	4.75E-07

217	0.00	0.000	0.011	0.2030	0.5208	0.0001	4.75E-07
218	0.68	0.259	0.027	0.2176	0.5207	0.0001	4.75E-07
219	0.00	0.000	0.211	0.2217	0.5205	0.0001	4.75E-07
220	0.00	0.000	0.087	0.2131	0.5203	0.0001	4.75E-07
221	0.00	0.000	0.131	0.2001	0.5201	0.0001	4.74E-07
222	0.27	0.047	0.120	0.2055	0.5199	0.0001	4.74E-07
223	0.00	0.000	0.073	0.2029	0.5197	0.0001	4.74E-07
224	0.00	0.000	0.032	0.1997	0.5196	0.0001	4.74E-07
225	0.00	0.000	0.024	0.1973	0.5194	0.0001	4.74E-07
226	0.37	0.089	0.046	0.2123	0.5192	0.0001	4.74E-07
227	0.00	0.000	0.201	0.2011	0.5190	0.0001	4.74E-07
228	0.00	0.000	0.028	0.1986	0.5188	0.0001	4.73E-07
229	0.00	0.000	0.016	0.1970	0.5186	0.0001	4.73E-07
230	0.00	0.000	0.000	0.1970	0.5185	0.0001	4.73E-07
231	0.00	0.000	0.000	0.1970	0.5183	0.0001	4.73E-07
232	0.00	0.000	0.000	0.1970	0.5181	0.0001	4.73E-07
233	0.00	0.000	0.000	0.1970	0.5179	0.0001	4.73E-07
234	0.00	0.000	0.000	0.1970	0.5177	0.0001	4.72E-07
235	0.01	0.000	0.006	0.1970	0.5176	0.0001	4.72E-07
236	0.00	0.000	0.000	0.1970	0.5174	0.0001	4.72E-07
237	0.00	0.000	0.000	0.1970	0.5172	0.0001	4.72E-07
238	0.13	0.000	0.012	0.2087	0.5170	0.0001	4.72E-07
239	0.00	0.000	0.010	0.2076	0.5168	0.0001	4.72E-07
240	0.00	0.000	0.010	0.2066	0.5167	0.0001	4.72E-07
241	0.00	0.000	0.013	0.2053	0.5165	0.0001	4.71E-07
242	0.98	0.425	0.029	0.2197	0.5163	0.0001	4.71E-07
243	0.00	0.000	0.339	0.2241	0.5161	0.0001	4.71E-07
244	0.00	0.000	0.191	0.2050	0.5159	0.0001	4.71E-07
245	0.00	0.000	0.073	0.1977	0.5157	0.0001	4.71E-07
246	0.00	0.000	0.007	0.1970	0.5156	0.0001	4.71E-07
247	0.00	0.000	0.000	0.1970	0.5154	0.0001	4.71E-07
248	0.00	0.000	0.000	0.1970	0.5152	0.0001	4.70E-07

249		0.00	0.000	0.000	0.1970	0.5150	0.0001	4.70E-07
250		0.06	0.000	0.013	0.2012	0.5148	0.0001	4.70E-07
251		0.13	0.000	0.025	0.2118	0.5147	0.0001	4.70E-07
252		0.00	0.000	0.014	0.2104	0.5145	0.0001	4.70E-07
253		0.00	0.000	0.017	0.2087	0.5143	0.0001	4.70E-07
254		0.00	0.000	0.019	0.2068	0.5141	0.0001	4.69E-07
255		0.00	0.000	0.018	0.2050	0.5139	0.0001	4.69E-07
256		0.07	0.000	0.027	0.2090	0.5138	0.0001	4.69E-07
257		0.00	0.000	0.018	0.2073	0.5136	0.0001	4.69E-07
258		1.03	0.454	0.032	0.2210	0.5134	0.0001	4.69E-07
259		0.00	0.042	0.202	0.2326	0.5132	0.0001	4.69E-07
260		0.00	0.000	0.158	0.2211	0.5130	0.0001	4.69E-07
261		0.00	0.000	0.086	0.2125	0.5129	0.0001	4.68E-07
262	*	0.04	0.000	0.092	0.2076	0.5127	0.0001	4.68E-07
263		0.00	0.000	0.101	0.1975	0.5125	0.0001	4.68E-07
264		0.00	0.000	0.003	0.1972	0.5123	0.0001	4.68E-07
265		0.18	0.012	0.078	0.2054	0.5123	0.0001	4.68E-07
266		0.30	0.041	0.114	0.2169	0.5122	0.0001	4.68E-07
267		0.09	0.000	0.101	0.2200	0.5120	0.0001	4.68E-07
268		0.43	0.066	0.170	0.2333	0.5118	0.0001	4.68E-07
269		0.00	0.000	0.148	0.2249	0.5117	0.0001	4.67E-07
270		0.00	0.000	0.102	0.2147	0.5115	0.0001	4.67E-07
271		0.05	0.000	0.174	0.2019	0.5113	0.0001	4.67E-07
272		0.00	0.000	0.031	0.1988	0.5111	0.0001	4.67E-07
273		0.03	0.000	0.032	0.1984	0.5109	0.0001	4.67E-07
274		0.00	0.000	0.010	0.1975	0.5108	0.0001	4.67E-07
275		0.00	0.000	0.004	0.1971	0.5106	0.0001	4.67E-07
276		0.00	0.000	0.001	0.1970	0.5104	0.0001	4.66E-07
277		0.00	0.000	0.000	0.1970	0.5102	0.0001	4.66E-07
278		0.00	0.000	0.000	0.1970	0.5100	0.0001	4.66E-07
279		0.00	0.000	0.000	0.1970	0.5099	0.0001	4.66E-07
280		0.66	0.232	0.036	0.2133	0.5097	0.0001	4.66E-07

281		0.00	0.000	0.163	0.2196	0.5095	0.0001	4.66E-07
282		0.00	0.000	0.059	0.2142	0.5093	0.0001	4.65E-07
283		0.12	0.000	0.085	0.2179	0.5092	0.0001	4.65E-07
284		0.00	0.000	0.062	0.2120	0.5090	0.0001	4.65E-07
285		0.00	0.000	0.073	0.2047	0.5088	0.0001	4.65E-07
286		0.00	0.000	0.067	0.1980	0.5086	0.0001	4.65E-07
287		0.00	0.000	0.010	0.1970	0.5084	0.0001	4.65E-07
288		0.00	0.000	0.000	0.1970	0.5083	0.0001	4.65E-07
289		0.00	0.000	0.000	0.1970	0.5081	0.0001	4.64E-07
290		0.00	0.000	0.000	0.1970	0.5079	0.0001	4.64E-07
291		0.27	0.052	0.040	0.2096	0.5077	0.0001	4.64E-07
292		0.68	0.269	0.090	0.2212	0.5075	0.0001	4.64E-07
293		0.00	0.000	0.146	0.2324	0.5074	0.0001	4.64E-07
294		0.00	0.000	0.049	0.2275	0.5072	0.0001	4.64E-07
295		0.00	0.000	0.048	0.2228	0.5070	0.0001	4.64E-07
296		0.00	0.000	0.097	0.2131	0.5068	0.0001	4.63E-07
297		0.00	0.000	0.063	0.2069	0.5067	0.0001	4.63E-07
298		0.00	0.000	0.084	0.1984	0.5065	0.0001	4.63E-07
299		3.14	1.784	0.097	0.2147	0.5063	0.0001	4.63E-07
300	*	0.00	0.000	0.031	0.2147	0.5061	0.0001	4.63E-07
301	*	0.00	0.000	0.015	0.2148	0.5059	0.0001	4.63E-07
302		0.49	0.177	0.000	0.2287	0.5058	0.0001	4.62E-07
303	*	0.06	0.588	0.000	0.2403	0.5056	0.0001	4.62E-07
304	*	0.00	0.204	0.008	0.2520	0.5054	0.0001	4.62E-07
305	*	0.21	0.005	0.021	0.2636	0.5052	0.0001	4.62E-07
306	*	0.04	0.000	0.035	0.2656	0.5051	0.0001	4.62E-07
307	*	0.01	0.000	0.036	0.2676	0.5049	0.0001	4.62E-07
308	*	0.02	0.000	0.000	0.2696	0.5047	0.0001	4.62E-07
309	*	0.00	0.000	0.020	0.2716	0.5045	0.0001	4.61E-07
310	*	1.15	0.000	0.000	0.2736	0.5044	0.0001	4.61E-07
311		0.64	1.206	0.000	0.2864	0.5042	0.0001	4.61E-07
312		0.06	0.248	0.098	0.2980	0.5040	0.0001	4.61E-07

313			0.00	0.032	0.069	0.3096	0.5038	0.0001	4.61E-07
314	*		0.00	0.000	0.032	0.3096	0.5036	0.0001	4.61E-07
315			0.32	0.060	0.074	0.3227	0.5035	0.0001	4.61E-07
316			0.00	0.000	0.171	0.3108	0.5033	0.0001	4.60E-07
317			0.00	0.000	0.112	0.2996	0.5031	0.0001	4.60E-07
318			0.00	0.000	0.048	0.2948	0.5029	0.0001	4.60E-07
319			0.00	0.000	0.057	0.2890	0.5028	0.0001	4.60E-07
320	*		0.00	0.000	0.000	0.2890	0.5026	0.0001	4.60E-07
321	*		0.00	0.000	0.000	0.2890	0.5024	0.0001	4.60E-07
322	*		0.00	0.000	0.000	0.2890	0.5022	0.0001	4.60E-07
323	*	*	0.00	0.000	0.000	0.2890	0.5021	0.0001	4.59E-07
324	*	*	0.00	0.000	0.000	0.2891	0.5019	0.0001	4.59E-07
325	*	*	0.00	0.000	0.000	0.2891	0.5017	0.0001	4.59E-07
326	*	*	0.00	0.000	0.000	0.2891	0.5015	0.0001	4.59E-07
327	*	*	0.00	0.000	0.000	0.2891	0.5014	0.0001	4.59E-07
328		*	0.00	0.000	0.000	0.2891	0.5012	0.0001	4.59E-07
329		*	0.00	0.000	0.000	0.2891	0.5010	0.0001	4.59E-07
330		*	0.00	0.000	0.000	0.2891	0.5008	0.0001	4.58E-07
331			0.00	0.000	0.044	0.2847	0.5007	0.0001	4.58E-07
332	*		0.00	0.000	0.000	0.2847	0.5005	0.0001	4.58E-07
333	*	*	0.00	0.000	0.000	0.2847	0.5003	0.0001	4.58E-07
334	*	*	0.00	0.000	0.000	0.2847	0.5001	0.0001	4.58E-07
335	*	*	0.00	0.000	0.000	0.2848	0.5000	0.0001	4.58E-07
336	*	*	0.00	0.000	0.000	0.2848	0.4998	0.0001	4.57E-07
337	*	*	0.00	0.000	0.000	0.2848	0.4996	0.0001	4.57E-07
338	*	*	0.00	0.000	0.000	0.2848	0.4994	0.0001	4.57E-07
339	*	*	0.00	0.000	0.000	0.2848	0.4993	0.0001	4.57E-07
340	*	*	0.00	0.000	0.000	0.2848	0.4991	0.0001	4.57E-07
341		*	0.00	0.000	0.000	0.2848	0.4989	0.0001	4.57E-07
342		*	0.56	0.314	0.008	0.2892	0.4987	0.0001	4.57E-07
343		*	0.12	0.115	0.083	0.2892	0.4986	0.0001	4.56E-07
344			0.02	0.000	0.102	0.2921	0.4984	0.0001	4.56E-07

345		0.20	0.024	0.093	0.2978	0.4982	0.0001	4.56E-07
346		0.05	0.000	0.084	0.2967	0.4984	0.0001	4.56E-07
347		0.00	0.000	0.132	0.2835	0.4992	0.0001	4.57E-07
348		0.00	0.000	0.097	0.2739	0.4990	0.0001	4.57E-07
349		0.00	0.000	0.085	0.2654	0.4989	0.0001	4.57E-07
350		0.00	0.000	0.165	0.2489	0.4987	0.0001	4.57E-07
351		0.00	0.000	0.147	0.2342	0.4985	0.0001	4.56E-07
352		0.00	0.000	0.136	0.2206	0.4983	0.0001	4.56E-07
353		0.00	0.000	0.065	0.2140	0.4982	0.0001	4.56E-07
354		0.00	0.000	0.058	0.2082	0.5024	0.0001	4.60E-07
355		0.00	0.000	0.045	0.1993	0.5536	0.0001	5.02E-07
356		0.00	0.000	0.023	0.1970	0.6389	0.0001	5.73E-07
357		0.00	0.000	0.000	0.1970	0.6387	0.0001	5.73E-07
358		0.00	0.000	0.000	0.1970	0.6385	0.0001	5.72E-07
359		0.00	0.000	0.000	0.1970	0.6383	0.0001	5.72E-07
360		0.00	0.000	0.000	0.1970	0.6381	0.0001	5.72E-07
361		0.00	0.000	0.000	0.1970	0.6378	0.0001	5.72E-07
362		0.00	0.000	0.000	0.1970	0.6376	0.0001	5.72E-07
363	*	0.00	0.000	0.000	0.1970	0.6374	0.0001	5.71E-07
364	*	0.29	0.000	0.034	0.1990	0.6372	0.0001	5.71E-07
365	*	0.00	0.000	0.030	0.2010	0.6369	0.0001	5.71E-07

* = Frozen (air or soil)

Annual Totals for Year 2			
	inches	cubic feet	percent
Precipitation	34.66	125,803.4	100.00
Runoff	13.245	48,078.1	38.22
Evapotranspiration	21.552	78,233.7	62.19
Recirculation into Layer 1	0.0219	79.4	0.06
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0219	79.4	0.06
Percolation/Leakage through Layer 5	0.000176	0.6380	0.00
Average Head on Top of Layer 4	0.5286	---	---
Change in Water Storage	-0.1402	-509.0	-0.40
Soil Water at Start of Year	293.1817	1,064,249.6	845.96
Soil Water at End of Year	293.1891	1,064,276.5	845.98
Snow Water at Start of Year	0.3365	1,221.4	0.97
Snow Water at End of Year	0.1888	685.4	0.54
Annual Water Budget Balance	-0.0219	-79.4	-0.06

Daily Output for Year 3

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.003	0.056	0.2137	0.6367	0.0001	5.71E-07
2			0.00	0.000	0.012	0.2128	0.6365	0.0001	5.71E-07
3			0.00	0.000	0.013	0.2115	0.6363	0.0001	5.71E-07
4	*		0.00	0.000	0.013	0.2102	0.6360	0.0001	5.70E-07
5			0.00	0.000	0.012	0.2089	0.6358	0.0001	5.70E-07
6			0.00	0.000	0.012	0.2077	0.6356	0.0001	5.70E-07
7			0.00	0.000	0.012	0.2066	0.6354	0.0001	5.70E-07
8			0.06	0.000	0.018	0.2107	0.6351	0.0001	5.70E-07
9			0.15	0.011	0.018	0.2221	0.6349	0.0001	5.69E-07
10			0.07	0.000	0.031	0.2268	0.6347	0.0001	5.69E-07
11			0.00	0.000	0.013	0.2255	0.6345	0.0001	5.69E-07
12			0.00	0.000	0.011	0.2244	0.6343	0.0001	5.69E-07
13			0.00	0.000	0.010	0.2234	0.6340	0.0001	5.69E-07
14			0.00	0.000	0.010	0.2225	0.6338	0.0001	5.69E-07
15			0.00	0.000	0.010	0.2215	0.6336	0.0001	5.68E-07
16			0.00	0.000	0.009	0.2206	0.6334	0.0001	5.68E-07
17			0.00	0.000	0.009	0.2197	0.6331	0.0001	5.68E-07
18			0.00	0.000	0.009	0.2188	0.6329	0.0001	5.68E-07
19			0.00	0.000	0.009	0.2179	0.6327	0.0001	5.68E-07
20			0.00	0.000	0.009	0.2170	0.6325	0.0001	5.67E-07
21			0.00	0.000	0.009	0.2162	0.6323	0.0001	5.67E-07
22			0.00	0.000	0.008	0.2153	0.6320	0.0001	5.67E-07
23			0.00	0.000	0.008	0.2145	0.6318	0.0001	5.67E-07
24			0.00	0.000	0.008	0.2137	0.6316	0.0001	5.67E-07

25		0.00	0.000	0.008	0.2129	0.6314	0.0001	5.67E-07
26		0.00	0.000	0.008	0.2121	0.6312	0.0001	5.66E-07
27		0.00	0.000	0.008	0.2113	0.6309	0.0001	5.66E-07
28	*	0.00	0.000	0.000	0.2113	0.6307	0.0001	5.66E-07
29	*	0.00	0.000	0.000	0.2113	0.6305	0.0001	5.66E-07
30		0.17	0.019	0.015	0.2235	0.6303	0.0001	5.66E-07
31		0.02	0.000	0.034	0.2241	0.6300	0.0001	5.65E-07
32		0.04	0.000	0.016	0.2262	0.6298	0.0001	5.65E-07
33		0.00	0.000	0.009	0.2253	0.6296	0.0001	5.65E-07
34	*	0.76	0.000	0.038	0.2273	0.6294	0.0001	5.65E-07
35		0.00	0.196	0.006	0.2400	0.6292	0.0001	5.65E-07
36		0.00	0.071	0.113	0.2517	0.6289	0.0001	5.65E-07
37	*	0.00	0.000	0.065	0.2517	0.6287	0.0001	5.64E-07
38		0.00	0.000	0.000	0.2517	0.6285	0.0001	5.64E-07
39	*	0.00	0.000	0.004	0.2517	0.6283	0.0001	5.64E-07
40	*	0.00	0.000	0.000	0.2517	0.6281	0.0001	5.64E-07
41		0.00	0.000	0.049	0.2467	0.6278	0.0001	5.64E-07
42		0.00	0.000	0.086	0.2381	0.6276	0.0001	5.63E-07
43		0.00	0.000	0.150	0.2231	0.6274	0.0001	5.63E-07
44		0.00	0.000	0.067	0.2165	0.6272	0.0001	5.63E-07
45		0.19	0.019	0.099	0.2215	0.6270	0.0001	5.63E-07
46		0.06	0.000	0.069	0.2221	0.6269	0.0001	5.63E-07
47	*	0.00	0.000	0.000	0.2221	0.6268	0.0001	5.63E-07
48	*	0.00	0.000	0.000	0.2221	0.6266	0.0001	5.63E-07
49		0.00	0.000	0.105	0.2116	0.6264	0.0001	5.62E-07
50	*	0.14	0.000	0.038	0.2136	0.6262	0.0001	5.62E-07
51	*	0.00	0.000	0.033	0.2156	0.6260	0.0001	5.62E-07
52	*	0.00	0.000	0.024	0.2156	0.6257	0.0001	5.62E-07
53	*	0.00	0.000	0.040	0.2116	0.6255	0.0001	5.62E-07
54		0.00	0.000	0.088	0.2028	0.6253	0.0001	5.62E-07
55		0.11	0.000	0.048	0.2094	0.6251	0.0001	5.61E-07
56		0.28	0.034	0.110	0.2192	0.6249	0.0001	5.61E-07

57		0.00	0.000	0.070	0.2156	0.6257	0.0001	5.62E-07
58	*	0.00	0.000	0.034	0.2122	0.6261	0.0001	5.62E-07
59		0.00	0.000	0.087	0.2035	0.6259	0.0001	5.62E-07
60		0.00	0.000	0.052	0.1984	0.6256	0.0001	5.62E-07
61		0.10	0.000	0.025	0.2059	0.6254	0.0001	5.62E-07
62		0.66	0.241	0.051	0.2191	0.6252	0.0001	5.61E-07
63		0.54	0.243	0.177	0.2307	0.6250	0.0001	5.61E-07
64		0.28	0.120	0.159	0.2424	0.6248	0.0001	5.61E-07
65		0.23	0.029	0.304	0.2414	0.6245	0.0001	5.61E-07
66		0.25	0.023	0.348	0.2300	0.6243	0.0001	5.61E-07
67		0.37	0.022	0.426	0.2224	0.6241	0.0001	5.61E-07
68		1.04	0.393	0.237	0.2340	0.6239	0.0001	5.60E-07
69		0.00	0.000	0.329	0.2326	0.6237	0.0001	5.60E-07
70		0.00	0.000	0.207	0.2120	0.6234	0.0001	5.60E-07
71		0.16	0.005	0.194	0.2076	0.6232	0.0001	5.60E-07
72		0.06	0.000	0.082	0.2058	0.6230	0.0001	5.60E-07
73		0.25	0.036	0.063	0.2174	0.6228	0.0001	5.59E-07
74		0.11	0.000	0.062	0.2258	0.6282	0.0001	5.64E-07
75	*	0.00	0.000	0.000	0.2258	0.6314	0.0001	5.67E-07
76	*	0.00	0.000	0.072	0.2186	0.6312	0.0001	5.66E-07
77		0.03	0.000	0.080	0.2131	0.6310	0.0001	5.66E-07
78		0.19	0.024	0.097	0.2181	0.6308	0.0001	5.66E-07
79		0.06	0.000	0.112	0.2150	0.6305	0.0001	5.66E-07
80		0.29	0.044	0.077	0.2277	0.6303	0.0001	5.66E-07
81	*	0.01	0.000	0.049	0.2277	0.6301	0.0001	5.65E-07
82	*	0.00	0.000	0.041	0.2237	0.6299	0.0001	5.65E-07
83		0.05	0.000	0.132	0.2157	0.6297	0.0001	5.65E-07
84		0.18	0.021	0.090	0.2209	0.6294	0.0001	5.65E-07
85		0.01	0.000	0.108	0.2136	0.6292	0.0001	5.65E-07
86	*	0.04	0.000	0.043	0.2136	0.6290	0.0001	5.65E-07
87		0.00	0.000	0.079	0.2057	0.6288	0.0001	5.64E-07
88		0.05	0.000	0.089	0.2021	0.6286	0.0001	5.64E-07

89		1.52	0.740	0.088	0.2147	0.6283	0.0001	5.64E-07
90	*	0.09	0.225	0.000	0.2263	0.6281	0.0001	5.64E-07
91	*	0.52	0.000	0.025	0.2290	0.6279	0.0001	5.64E-07
92	*	0.34	0.000	0.016	0.2310	0.6277	0.0001	5.63E-07
93	*	0.00	0.000	0.032	0.2330	0.6275	0.0001	5.63E-07
94		0.00	0.000	0.052	0.2350	0.6272	0.0001	5.63E-07
95		0.16	0.568	0.000	0.2477	0.6270	0.0001	5.63E-07
96		0.00	0.102	0.114	0.2594	0.6268	0.0001	5.63E-07
97		0.00	0.000	0.216	0.2482	0.6270	0.0001	5.63E-07
98		0.00	0.000	0.197	0.2288	0.6271	0.0001	5.63E-07
99		0.19	0.015	0.192	0.2255	0.6269	0.0001	5.63E-07
100		0.00	0.000	0.179	0.2091	0.6267	0.0001	5.63E-07
101		0.00	0.000	0.085	0.2006	0.6264	0.0001	5.62E-07
102		0.33	0.046	0.171	0.2069	0.6262	0.0001	5.62E-07
103		0.08	0.000	0.110	0.2081	0.6260	0.0001	5.62E-07
104		0.00	0.000	0.089	0.1992	0.6258	0.0001	5.62E-07
105		0.00	0.000	0.017	0.1975	0.6256	0.0001	5.62E-07
106		0.00	0.000	0.005	0.1970	0.6253	0.0001	5.62E-07
107		0.84	0.323	0.052	0.2133	0.6251	0.0001	5.61E-07
108		0.04	0.028	0.173	0.2249	0.6249	0.0001	5.61E-07
109		0.30	0.063	0.086	0.2365	0.6247	0.0001	5.61E-07
110		0.00	0.000	0.119	0.2310	0.6245	0.0001	5.61E-07
111		0.00	0.000	0.111	0.2199	0.6242	0.0001	5.61E-07
112		0.04	0.000	0.218	0.2021	0.6240	0.0001	5.60E-07
113		0.40	0.037	0.315	0.2035	0.6238	0.0001	5.60E-07
114		0.10	0.000	0.094	0.2080	0.6236	0.0001	5.60E-07
115		0.50	0.032	0.306	0.2214	0.6234	0.0001	5.60E-07
116		0.45	0.075	0.221	0.2330	0.6232	0.0001	5.60E-07
117		0.50	0.135	0.202	0.2446	0.6229	0.0001	5.60E-07
118		0.00	0.000	0.295	0.2272	0.6245	0.0001	5.61E-07
119		0.00	0.000	0.194	0.2078	0.6254	0.0001	5.62E-07
120		0.00	0.000	0.098	0.1980	0.6252	0.0001	5.61E-07

121	0.00	0.000	0.008	0.1972	0.6250	0.0001	5.61E-07
122	2.29	1.225	0.066	0.2134	0.6247	0.0001	5.61E-07
123	0.00	0.231	0.260	0.2251	0.6245	0.0001	5.61E-07
124	0.40	0.084	0.355	0.2367	0.6243	0.0001	5.61E-07
125	0.03	0.000	0.268	0.2211	0.6256	0.0001	5.62E-07
126	0.17	0.006	0.262	0.2108	0.6263	0.0001	5.62E-07
127	0.00	0.000	0.101	0.2013	0.6261	0.0001	5.62E-07
128	0.00	0.000	0.030	0.1983	0.6258	0.0001	5.62E-07
129	0.00	0.000	0.012	0.1971	0.6256	0.0001	5.62E-07
130	0.00	0.000	0.001	0.1970	0.6254	0.0001	5.62E-07
131	1.53	0.739	0.052	0.2133	0.6252	0.0001	5.61E-07
132	0.20	0.281	0.098	0.2249	0.6250	0.0001	5.61E-07
133	0.02	0.056	0.074	0.2365	0.6247	0.0001	5.61E-07
134	1.76	0.926	0.226	0.2482	0.6245	0.0001	5.61E-07
135	0.04	0.119	0.236	0.2598	0.6243	0.0001	5.61E-07
136	0.00	0.000	0.216	0.2501	0.6241	0.0001	5.61E-07
137	0.03	0.000	0.100	0.2428	0.6239	0.0001	5.60E-07
138	0.04	0.000	0.142	0.2324	0.6237	0.0001	5.60E-07
139	0.10	0.000	0.239	0.2183	0.6234	0.0001	5.60E-07
140	0.84	0.273	0.210	0.2300	0.6232	0.0001	5.60E-07
141	0.01	0.015	0.105	0.2417	0.6230	0.0001	5.60E-07
142	0.00	0.000	0.175	0.2257	0.6228	0.0001	5.59E-07
143	0.00	0.000	0.137	0.2120	0.6226	0.0001	5.59E-07
144	0.00	0.000	0.132	0.1987	0.6223	0.0001	5.59E-07
145	0.21	0.027	0.076	0.2063	0.6228	0.0001	5.59E-07
146	0.00	0.000	0.094	0.1996	0.6244	0.0001	5.61E-07
147	0.00	0.000	0.022	0.1973	0.6242	0.0001	5.61E-07
148	0.18	0.018	0.036	0.2083	0.6240	0.0001	5.60E-07
149	0.00	0.000	0.038	0.2064	0.6238	0.0001	5.60E-07
150	0.00	0.000	0.027	0.2037	0.6236	0.0001	5.60E-07
151	0.00	0.000	0.026	0.2010	0.6233	0.0001	5.60E-07
152	0.14	0.000	0.032	0.2116	0.6231	0.0001	5.60E-07

153	0.11	0.000	0.027	0.2196	0.6229	0.0001	5.60E-07
154	0.13	0.000	0.020	0.2311	0.6227	0.0001	5.59E-07
155	0.00	0.000	0.183	0.2128	0.6225	0.0001	5.59E-07
156	0.00	0.000	0.022	0.2106	0.6222	0.0001	5.59E-07
157	0.00	0.000	0.025	0.2081	0.6220	0.0001	5.59E-07
158	0.00	0.000	0.022	0.2060	0.6218	0.0001	5.59E-07
159	0.20	0.029	0.028	0.2171	0.6216	0.0001	5.58E-07
160	0.00	0.000	0.050	0.2149	0.6214	0.0001	5.58E-07
161	0.00	0.000	0.023	0.2127	0.6212	0.0001	5.58E-07
162	0.00	0.000	0.018	0.2109	0.6209	0.0001	5.58E-07
163	0.00	0.000	0.015	0.2094	0.6207	0.0001	5.58E-07
164	0.02	0.000	0.021	0.2093	0.6205	0.0001	5.58E-07
165	0.19	0.021	0.027	0.2214	0.6203	0.0001	5.57E-07
166	0.09	0.000	0.047	0.2280	0.6201	0.0001	5.57E-07
167	0.02	0.000	0.237	0.2066	0.6199	0.0001	5.57E-07
168	1.10	0.488	0.028	0.2225	0.6196	0.0001	5.57E-07
169	0.00	0.000	0.428	0.2223	0.6194	0.0001	5.57E-07
170	0.00	0.000	0.197	0.2028	0.6192	0.0001	5.57E-07
171	0.01	0.000	0.060	0.1979	0.6190	0.0001	5.56E-07
172	0.54	0.112	0.157	0.2134	0.6188	0.0001	5.56E-07
173	0.10	0.000	0.137	0.2212	0.6186	0.0001	5.56E-07
174	0.00	0.000	0.149	0.2063	0.6183	0.0001	5.56E-07
175	0.00	0.000	0.069	0.1994	0.6181	0.0001	5.56E-07
176	0.00	0.000	0.024	0.1970	0.6179	0.0001	5.55E-07
177	0.00	0.000	0.000	0.1970	0.6177	0.0001	5.55E-07
178	0.18	0.019	0.030	0.2086	0.6175	0.0001	5.55E-07
179	1.12	0.521	0.068	0.2199	0.6173	0.0001	5.55E-07
180	0.00	0.007	0.310	0.2315	0.6170	0.0001	5.55E-07
181	0.20	0.030	0.133	0.2329	0.6168	0.0001	5.55E-07
182	0.38	0.051	0.188	0.2445	0.6166	0.0001	5.54E-07
183	0.04	0.000	0.219	0.2318	0.6164	0.0001	5.54E-07
184	0.00	0.000	0.236	0.2083	0.6162	0.0001	5.54E-07

185	0.00	0.000	0.095	0.1988	0.6160	0.0001	5.54E-07
186	0.00	0.000	0.014	0.1974	0.6158	0.0001	5.54E-07
187	0.00	0.000	0.004	0.1970	0.6155	0.0001	5.54E-07
188	1.23	0.551	0.058	0.2128	0.6153	0.0001	5.53E-07
189	0.01	0.000	0.408	0.2192	0.6151	0.0001	5.53E-07
190	0.00	0.000	0.096	0.2096	0.6149	0.0001	5.53E-07
191	0.00	0.000	0.110	0.1986	0.6147	0.0001	5.53E-07
192	0.00	0.000	0.016	0.1970	0.6145	0.0001	5.53E-07
193	0.00	0.000	0.000	0.1970	0.6142	0.0001	5.52E-07
194	0.06	0.000	0.014	0.2017	0.6140	0.0001	5.52E-07
195	0.13	0.000	0.029	0.2122	0.6138	0.0001	5.52E-07
196	0.05	0.000	0.030	0.2139	0.6136	0.0001	5.52E-07
197	0.00	0.000	0.027	0.2112	0.6134	0.0001	5.52E-07
198	0.00	0.000	0.032	0.2081	0.6132	0.0001	5.52E-07
199	0.00	0.000	0.027	0.2053	0.6130	0.0001	5.51E-07
200	0.00	0.000	0.031	0.2022	0.6127	0.0001	5.51E-07
201	0.07	0.000	0.035	0.2060	0.6125	0.0001	5.51E-07
202	0.07	0.000	0.042	0.2089	0.6123	0.0001	5.51E-07
203	0.37	0.109	0.036	0.2204	0.6121	0.0001	5.51E-07
204	0.02	0.000	0.259	0.2079	0.6119	0.0001	5.50E-07
205	0.00	0.000	0.022	0.2057	0.6117	0.0001	5.50E-07
206	0.00	0.000	0.026	0.2030	0.6115	0.0001	5.50E-07
207	0.84	0.335	0.042	0.2181	0.6112	0.0001	5.50E-07
208	0.03	0.030	0.167	0.2297	0.6110	0.0001	5.50E-07
209	0.42	0.095	0.146	0.2413	0.6108	0.0001	5.50E-07
210	0.00	0.000	0.297	0.2207	0.6106	0.0001	5.49E-07
211	0.00	0.000	0.192	0.2015	0.6104	0.0001	5.49E-07
212	1.25	0.510	0.162	0.2171	0.6102	0.0001	5.49E-07
213	0.00	0.040	0.223	0.2287	0.6100	0.0001	5.49E-07
214	0.25	0.024	0.281	0.2249	0.6097	0.0001	5.49E-07
215	0.00	0.000	0.175	0.2098	0.6095	0.0001	5.49E-07
216	0.00	0.000	0.103	0.1995	0.6093	0.0001	5.48E-07

217	0.00	0.000	0.024	0.1970	0.6091	0.0001	5.48E-07
218	0.00	0.000	0.000	0.1970	0.6089	0.0001	5.48E-07
219	0.00	0.000	0.000	0.1970	0.6087	0.0001	5.48E-07
220	0.00	0.000	0.000	0.1970	0.6085	0.0001	5.48E-07
221	0.37	0.085	0.052	0.2115	0.6083	0.0001	5.48E-07
222	0.00	0.000	0.102	0.2098	0.6080	0.0001	5.47E-07
223	0.00	0.000	0.031	0.2066	0.6078	0.0001	5.47E-07
224	0.00	0.000	0.029	0.2038	0.6076	0.0001	5.47E-07
225	0.00	0.000	0.028	0.2010	0.6074	0.0001	5.47E-07
226	0.00	0.000	0.020	0.1990	0.6072	0.0001	5.47E-07
227	0.00	0.000	0.016	0.1975	0.6070	0.0001	5.46E-07
228	0.00	0.000	0.005	0.1970	0.6068	0.0001	5.46E-07
229	0.00	0.000	0.000	0.1970	0.6066	0.0001	5.46E-07
230	0.00	0.000	0.000	0.1970	0.6063	0.0001	5.46E-07
231	0.00	0.000	0.000	0.1970	0.6061	0.0001	5.46E-07
232	0.00	0.000	0.000	0.1970	0.6059	0.0001	5.46E-07
233	0.30	0.068	0.035	0.2102	0.6057	0.0001	5.45E-07
234	0.27	0.063	0.097	0.2216	0.6055	0.0001	5.45E-07
235	0.00	0.000	0.166	0.2113	0.6053	0.0001	5.45E-07
236	0.00	0.000	0.023	0.2089	0.6051	0.0001	5.45E-07
237	0.00	0.000	0.021	0.2068	0.6049	0.0001	5.45E-07
238	0.00	0.000	0.020	0.2048	0.6046	0.0001	5.45E-07
239	0.00	0.000	0.022	0.2026	0.6044	0.0001	5.44E-07
240	1.82	0.934	0.031	0.2182	0.6042	0.0001	5.44E-07
241	0.00	0.138	0.305	0.2299	0.6040	0.0001	5.44E-07
242	0.00	0.000	0.224	0.2213	0.6038	0.0001	5.44E-07
243	0.11	0.000	0.140	0.2188	0.6036	0.0001	5.44E-07
244	0.00	0.000	0.150	0.2038	0.6034	0.0001	5.43E-07
245	0.00	0.000	0.051	0.1988	0.6032	0.0001	5.43E-07
246	0.43	0.070	0.162	0.2116	0.6029	0.0001	5.43E-07
247	0.25	0.025	0.266	0.2116	0.6027	0.0001	5.43E-07
248	0.06	0.000	0.087	0.2117	0.6025	0.0001	5.43E-07

249	0.14	0.000	0.079	0.2183	0.6023	0.0001	5.43E-07
250	0.25	0.033	0.115	0.2253	0.6021	0.0001	5.42E-07
251	0.12	0.000	0.092	0.2315	0.6019	0.0001	5.42E-07
252	0.01	0.000	0.168	0.2158	0.6017	0.0001	5.42E-07
253	0.00	0.000	0.147	0.2012	0.6015	0.0001	5.42E-07
254	0.00	0.000	0.034	0.1978	0.6013	0.0001	5.42E-07
255	0.00	0.000	0.004	0.1974	0.6010	0.0001	5.42E-07
256	0.00	0.000	0.002	0.1972	0.6008	0.0001	5.41E-07
257	0.43	0.110	0.060	0.2124	0.6006	0.0001	5.41E-07
258	0.00	0.000	0.134	0.2100	0.6004	0.0001	5.41E-07
259	0.36	0.085	0.054	0.2232	0.6002	0.0001	5.41E-07
260	0.06	0.000	0.126	0.2256	0.6000	0.0001	5.41E-07
261	0.00	0.000	0.069	0.2191	0.5998	0.0001	5.41E-07
262	0.41	0.092	0.083	0.2334	0.5996	0.0001	5.40E-07
263	0.03	0.000	0.124	0.2335	0.5994	0.0001	5.40E-07
264	0.00	0.000	0.123	0.2212	0.5992	0.0001	5.40E-07
265	0.00	0.000	0.103	0.2110	0.5989	0.0001	5.40E-07
266	0.00	0.000	0.113	0.1996	0.5987	0.0001	5.40E-07
267	0.03	0.000	0.038	0.1987	0.5985	0.0001	5.39E-07
268	0.01	0.000	0.014	0.1981	0.5983	0.0001	5.39E-07
269	1.08	0.463	0.061	0.2133	0.5981	0.0001	5.39E-07
270	0.09	0.075	0.228	0.2249	0.5979	0.0001	5.39E-07
271	0.15	0.011	0.122	0.2334	0.5977	0.0001	5.39E-07
272	0.00	0.000	0.246	0.2100	0.5975	0.0001	5.39E-07
273	0.00	0.000	0.101	0.1999	0.5973	0.0001	5.38E-07
274	0.00	0.000	0.018	0.1981	0.5971	0.0001	5.38E-07
275	0.06	0.000	0.028	0.2009	0.5968	0.0001	5.38E-07
276	0.41	0.108	0.073	0.2132	0.5966	0.0001	5.38E-07
277	0.09	0.000	0.188	0.2139	0.5974	0.0001	5.39E-07
278	0.00	0.000	0.128	0.2017	0.5978	0.0001	5.39E-07
279	0.79	0.246	0.156	0.2175	0.5976	0.0001	5.39E-07
280	0.00	0.000	0.289	0.2115	0.5974	0.0001	5.39E-07

281		0.00	0.000	0.119	0.1996	0.5972	0.0001	5.38E-07
282		0.00	0.000	0.024	0.1971	0.5970	0.0001	5.38E-07
283		0.00	0.000	0.001	0.1970	0.5968	0.0001	5.38E-07
284		0.14	0.000	0.018	0.2089	0.5966	0.0001	5.38E-07
285		0.00	0.000	0.019	0.2069	0.5964	0.0001	5.38E-07
286		0.00	0.000	0.023	0.2046	0.5962	0.0001	5.38E-07
287		0.00	0.000	0.023	0.2023	0.5960	0.0001	5.37E-07
288		0.00	0.000	0.021	0.2003	0.5958	0.0001	5.37E-07
289		0.00	0.000	0.019	0.1984	0.5955	0.0001	5.37E-07
290		0.00	0.000	0.009	0.1975	0.5953	0.0001	5.37E-07
291		0.00	0.000	0.005	0.1970	0.5951	0.0001	5.37E-07
292		0.00	0.000	0.000	0.1970	0.5949	0.0001	5.37E-07
293		0.00	0.000	0.000	0.1970	0.5947	0.0001	5.36E-07
294		0.00	0.000	0.000	0.1970	0.5945	0.0001	5.36E-07
295		0.00	0.000	0.000	0.1970	0.5943	0.0001	5.36E-07
296		0.29	0.064	0.029	0.2106	0.5941	0.0001	5.36E-07
297		0.00	0.000	0.072	0.2098	0.5939	0.0001	5.36E-07
298		0.00	0.000	0.013	0.2086	0.5937	0.0001	5.35E-07
299		0.00	0.000	0.012	0.2074	0.5935	0.0001	5.35E-07
300		0.00	0.000	0.011	0.2063	0.5933	0.0001	5.35E-07
301		0.00	0.000	0.011	0.2052	0.5931	0.0001	5.35E-07
302		0.00	0.000	0.011	0.2041	0.5928	0.0001	5.35E-07
303		0.00	0.000	0.010	0.2030	0.5926	0.0001	5.35E-07
304		0.00	0.000	0.010	0.2020	0.5924	0.0001	5.34E-07
305		0.00	0.000	0.010	0.2010	0.5922	0.0001	5.34E-07
306		0.00	0.000	0.010	0.2001	0.5920	0.0001	5.34E-07
307		0.00	0.000	0.010	0.1991	0.5918	0.0001	5.34E-07
308		0.00	0.000	0.008	0.1983	0.5916	0.0001	5.34E-07
309		0.00	0.000	0.010	0.1973	0.5914	0.0001	5.34E-07
310	*	0.00	0.000	0.003	0.1970	0.5912	0.0001	5.33E-07
311		0.00	0.000	0.001	0.1970	0.5910	0.0001	5.33E-07
312		0.00	0.000	0.000	0.1970	0.5908	0.0001	5.33E-07

313		0.00	0.000	0.000	0.1970	0.5906	0.0001	5.33E-07
314		0.00	0.000	0.000	0.1970	0.5904	0.0001	5.33E-07
315		0.20	0.029	0.015	0.2100	0.5902	0.0001	5.33E-07
316		0.01	0.000	0.042	0.2101	0.5899	0.0001	5.32E-07
317		0.00	0.000	0.008	0.2093	0.5897	0.0001	5.32E-07
318		0.00	0.000	0.008	0.2085	0.5895	0.0001	5.32E-07
319		0.17	0.014	0.018	0.2205	0.5893	0.0001	5.32E-07
320		0.00	0.000	0.020	0.2198	0.5891	0.0001	5.32E-07
321		0.00	0.000	0.008	0.2191	0.5889	0.0001	5.32E-07
322		0.00	0.000	0.008	0.2183	0.5887	0.0001	5.31E-07
323		0.00	0.000	0.007	0.2176	0.5885	0.0001	5.31E-07
324	*	0.01	0.000	0.006	0.2176	0.5883	0.0001	5.31E-07
325	*	0.00	0.000	0.000	0.2176	0.5881	0.0001	5.31E-07
326	*	0.00	0.000	0.000	0.2176	0.5879	0.0001	5.31E-07
327		0.04	0.000	0.016	0.2202	0.5877	0.0001	5.31E-07
328		0.57	0.217	0.020	0.2329	0.5875	0.0001	5.30E-07
329		0.00	0.000	0.143	0.2397	0.5873	0.0001	5.30E-07
330		0.00	0.000	0.056	0.2341	0.5871	0.0001	5.30E-07
331		0.00	0.000	0.090	0.2252	0.5869	0.0001	5.30E-07
332		0.00	0.000	0.040	0.2211	0.5867	0.0001	5.30E-07
333	*	0.00	0.000	0.035	0.2176	0.5865	0.0001	5.30E-07
334		0.00	0.000	0.068	0.2109	0.5863	0.0001	5.29E-07
335		0.00	0.000	0.038	0.2071	0.5861	0.0001	5.29E-07
336		0.00	0.000	0.063	0.2007	0.5859	0.0001	5.29E-07
337		0.37	0.077	0.069	0.2152	0.5856	0.0001	5.29E-07
338		0.00	0.000	0.099	0.2130	0.5854	0.0001	5.29E-07
339		0.00	0.000	0.069	0.2060	0.5852	0.0001	5.29E-07
340		0.09	0.000	0.054	0.2097	0.5850	0.0001	5.28E-07
341		0.23	0.035	0.076	0.2180	0.5848	0.0001	5.28E-07
342		0.00	0.000	0.078	0.2137	0.5846	0.0001	5.28E-07
343		0.08	0.000	0.090	0.2126	0.5844	0.0001	5.28E-07
344		0.18	0.013	0.078	0.2201	0.5842	0.0001	5.28E-07

345		0.31	0.048	0.115	0.2317	0.5840	0.0001	5.28E-07
346		0.00	0.000	0.057	0.2308	0.5838	0.0001	5.27E-07
347	*	0.00	0.000	0.000	0.2308	0.5836	0.0001	5.27E-07
348		0.00	0.000	0.044	0.2265	0.5834	0.0001	5.27E-07
349		0.00	0.000	0.052	0.2213	0.5832	0.0001	5.27E-07
350		0.00	0.000	0.062	0.2151	0.5830	0.0001	5.27E-07
351	*	0.13	0.000	0.045	0.2171	0.5828	0.0001	5.27E-07
352		0.00	0.000	0.071	0.2168	0.5826	0.0001	5.26E-07
353		0.00	0.000	0.043	0.2125	0.5824	0.0001	5.26E-07
354		0.12	0.000	0.063	0.2184	0.5822	0.0001	5.26E-07
355	*	0.02	0.000	0.023	0.2184	0.5820	0.0001	5.26E-07
356	*	0.00	0.000	0.000	0.2184	0.5818	0.0001	5.26E-07
357	*	0.00	0.000	0.000	0.2185	0.5816	0.0001	5.25E-07
358	*	0.00	0.000	0.030	0.2154	0.5814	0.0001	5.25E-07
359		0.00	0.000	0.050	0.2105	0.5812	0.0001	5.25E-07
360	*	0.00	0.000	0.000	0.2105	0.5810	0.0001	5.25E-07
361		0.00	0.000	0.045	0.2060	0.5808	0.0001	5.25E-07
362		0.00	0.000	0.047	0.2013	0.5814	0.0001	5.25E-07
363	*	0.59	0.000	0.030	0.2033	0.5818	0.0001	5.26E-07
364	*	0.28	0.000	0.030	0.2053	0.5816	0.0001	5.25E-07
365	*	0.00	0.000	0.028	0.2072	0.5814	0.0001	5.25E-07

* = Frozen (air or soil)

Annual Totals for Year 3			
	inches	cubic feet	percent
Precipitation	42.65	154,830.0	100.00
Runoff	14.020	50,893.5	32.87
Evapotranspiration	28.059	101,853.0	65.78
Recirculation into Layer 1	0.0253	91.9	0.06
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0253	91.9	0.06
Percolation/Leakage through Layer 5	0.000201	0.7295	0.00
Average Head on Top of Layer 4	0.6121	---	---
Change in Water Storage	0.5738	2,082.7	1.35
Soil Water at Start of Year	293.1891	1,064,276.5	687.38
Soil Water at End of Year	293.2337	1,064,438.3	687.49
Snow Water at Start of Year	0.1888	685.4	0.44
Snow Water at End of Year	0.7180	2,606.3	1.68
Annual Water Budget Balance	-0.0253	-92.0	-0.06

Daily Output for Year 4

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.039	0.2092	0.5812	0.0001	5.25E-07
2			0.00	0.269	0.000	0.2219	0.5810	0.0001	5.25E-07
3			0.00	0.013	0.120	0.2336	0.5808	0.0001	5.25E-07
4			0.00	0.000	0.070	0.2279	0.5805	0.0001	5.25E-07
5			0.00	0.000	0.077	0.2202	0.5804	0.0001	5.24E-07
6			0.00	0.000	0.064	0.2138	0.5802	0.0001	5.24E-07
7	*		0.00	0.000	0.037	0.2101	0.5801	0.0001	5.24E-07
8			0.00	0.000	0.061	0.2040	0.5801	0.0001	5.24E-07
9			0.00	0.000	0.044	0.1996	0.5799	0.0001	5.24E-07
10			0.00	0.000	0.025	0.1971	0.5797	0.0001	5.24E-07
11			0.00	0.000	0.001	0.1971	0.5795	0.0001	5.24E-07
12			0.00	0.000	0.001	0.1970	0.5793	0.0001	5.24E-07
13			0.00	0.000	0.000	0.1970	0.5791	0.0001	5.23E-07
14	*		0.00	0.000	0.000	0.1970	0.5789	0.0001	5.23E-07
15	*		0.00	0.000	0.000	0.1970	0.5787	0.0001	5.23E-07
16			0.00	0.000	0.000	0.1970	0.5785	0.0001	5.23E-07
17			0.00	0.000	0.000	0.1970	0.5783	0.0001	5.23E-07
18			0.00	0.000	0.000	0.1970	0.5781	0.0001	5.23E-07
19			0.00	0.000	0.000	0.1970	0.5779	0.0001	5.22E-07
20			0.00	0.000	0.000	0.1970	0.5777	0.0001	5.22E-07
21			0.00	0.000	0.000	0.1970	0.5775	0.0001	5.22E-07
22			0.00	0.000	0.000	0.1970	0.5773	0.0001	5.22E-07
23			0.00	0.000	0.000	0.1970	0.5771	0.0001	5.22E-07
24			0.00	0.000	0.000	0.1970	0.5769	0.0001	5.22E-07

25		0.72	0.266	0.032	0.2133	0.5767	0.0001	5.21E-07
26		0.00	0.001	0.139	0.2249	0.5765	0.0001	5.21E-07
27		0.00	0.000	0.038	0.2212	0.5763	0.0001	5.21E-07
28		0.00	0.000	0.049	0.2164	0.5761	0.0001	5.21E-07
29		0.00	0.000	0.056	0.2107	0.5759	0.0001	5.21E-07
30		0.00	0.000	0.065	0.2043	0.5757	0.0001	5.21E-07
31		0.00	0.000	0.056	0.1986	0.5755	0.0001	5.20E-07
32		0.00	0.000	0.015	0.1971	0.5753	0.0001	5.20E-07
33		0.19	0.020	0.034	0.2085	0.5751	0.0001	5.20E-07
34		0.21	0.037	0.056	0.2186	0.5749	0.0001	5.20E-07
35		0.05	0.000	0.077	0.2199	0.5747	0.0001	5.20E-07
36		0.09	0.000	0.071	0.2216	0.5744	0.0001	5.20E-07
37		0.23	0.035	0.078	0.2296	0.5742	0.0001	5.19E-07
38		0.00	0.000	0.097	0.2234	0.5740	0.0001	5.19E-07
39		0.00	0.000	0.056	0.2178	0.5738	0.0001	5.19E-07
40	*	0.00	0.000	0.043	0.2136	0.5736	0.0001	5.19E-07
41		0.00	0.000	0.053	0.2083	0.5734	0.0001	5.19E-07
42		0.00	0.000	0.038	0.2045	0.5732	0.0001	5.19E-07
43		0.07	0.000	0.046	0.2065	0.5730	0.0001	5.18E-07
44		0.07	0.000	0.043	0.2088	0.5728	0.0001	5.18E-07
45		0.20	0.024	0.038	0.2200	0.5726	0.0001	5.18E-07
46		0.09	0.000	0.119	0.2192	0.5724	0.0001	5.18E-07
47		0.18	0.019	0.029	0.2307	0.5722	0.0001	5.18E-07
48		0.00	0.000	0.099	0.2227	0.5720	0.0001	5.18E-07
49		0.03	0.000	0.027	0.2230	0.5718	0.0001	5.17E-07
50		0.00	0.000	0.021	0.2209	0.5716	0.0001	5.17E-07
51		0.00	0.000	0.019	0.2190	0.5714	0.0001	5.17E-07
52		0.05	0.000	0.024	0.2215	0.5712	0.0001	5.17E-07
53		0.09	0.000	0.025	0.2284	0.5710	0.0001	5.17E-07
54		0.70	0.282	0.030	0.2413	0.5708	0.0001	5.17E-07
55		0.00	0.023	0.093	0.2529	0.5706	0.0001	5.16E-07
56		0.00	0.000	0.093	0.2459	0.5704	0.0001	5.16E-07

57		0.67	0.232	0.105	0.2595	0.5702	0.0001	5.16E-07
58		0.68	0.325	0.191	0.2711	0.5700	0.0001	5.16E-07
59		0.41	0.216	0.145	0.2828	0.5698	0.0001	5.16E-07
60		0.00	0.000	0.170	0.2836	0.5696	0.0001	5.16E-07
61		0.00	0.000	0.077	0.2759	0.5694	0.0001	5.15E-07
62		0.00	0.000	0.105	0.2654	0.5692	0.0001	5.15E-07
63		0.00	0.000	0.123	0.2531	0.5690	0.0001	5.15E-07
64		0.00	0.000	0.073	0.2458	0.5688	0.0001	5.15E-07
65	*	0.00	0.000	0.000	0.2459	0.5686	0.0001	5.15E-07
66	*	0.00	0.000	0.000	0.2459	0.5684	0.0001	5.15E-07
67	*	0.02	0.000	0.025	0.2459	0.5682	0.0001	5.14E-07
68	*	0.16	0.000	0.030	0.2478	0.5680	0.0001	5.14E-07
69	*	0.00	0.000	0.065	0.2498	0.5678	0.0001	5.14E-07
70		0.00	0.000	0.155	0.2371	0.5676	0.0001	5.14E-07
71		0.00	0.000	0.174	0.2198	0.5674	0.0001	5.14E-07
72		0.01	0.000	0.107	0.2101	0.5672	0.0001	5.14E-07
73	*	1.14	0.000	0.030	0.2121	0.5670	0.0001	5.13E-07
74		0.27	0.221	0.000	0.2264	0.5668	0.0001	5.13E-07
75		0.20	0.260	0.000	0.2381	0.5666	0.0001	5.13E-07
76		0.71	0.843	0.000	0.2497	0.5664	0.0001	5.13E-07
77		0.04	0.136	0.229	0.2613	0.5663	0.0001	5.13E-07
78		0.07	0.000	0.142	0.2680	0.5661	0.0001	5.13E-07
79		0.01	0.000	0.117	0.2571	0.5659	0.0001	5.12E-07
80		0.37	0.071	0.078	0.2720	0.5657	0.0001	5.12E-07
81		0.00	0.000	0.143	0.2652	0.5655	0.0001	5.12E-07
82		0.00	0.000	0.102	0.2550	0.5653	0.0001	5.12E-07
83		0.00	0.000	0.060	0.2490	0.5651	0.0001	5.12E-07
84		0.05	0.000	0.223	0.2313	0.5649	0.0001	5.12E-07
85		0.00	0.000	0.187	0.2126	0.5647	0.0001	5.12E-07
86		0.00	0.000	0.136	0.1989	0.5645	0.0001	5.11E-07
87		0.00	0.000	0.015	0.1974	0.5676	0.0001	5.14E-07
88		0.28	0.051	0.068	0.2089	0.5674	0.0001	5.14E-07

89		1.08	0.354	0.375	0.2206	0.5672	0.0001	5.14E-07
90		0.01	0.000	0.294	0.2200	0.5704	0.0001	5.16E-07
91		0.00	0.000	0.125	0.2075	0.5722	0.0001	5.18E-07
92		0.00	0.000	0.089	0.1986	0.5720	0.0001	5.18E-07
93		0.09	0.000	0.042	0.2033	0.5718	0.0001	5.17E-07
94		0.01	0.000	0.059	0.1985	0.5716	0.0001	5.17E-07
95		0.72	0.211	0.150	0.2147	0.5714	0.0001	5.17E-07
96		1.74	0.975	0.128	0.2264	0.5712	0.0001	5.17E-07
97		0.00	0.236	0.131	0.2380	0.5710	0.0001	5.17E-07
98		0.08	0.060	0.084	0.2496	0.5708	0.0001	5.17E-07
99		0.02	0.000	0.116	0.2455	0.5706	0.0001	5.16E-07
100		0.01	0.000	0.086	0.2381	0.5704	0.0001	5.16E-07
101		0.00	0.000	0.183	0.2198	0.5702	0.0001	5.16E-07
102		0.01	0.000	0.118	0.2091	0.5700	0.0001	5.16E-07
103		0.00	0.000	0.099	0.1992	0.5698	0.0001	5.16E-07
104		0.09	0.000	0.034	0.2048	0.5696	0.0001	5.16E-07
105		0.00	0.000	0.052	0.1996	0.5694	0.0001	5.15E-07
106		0.00	0.000	0.019	0.1977	0.5692	0.0001	5.15E-07
107	*	0.00	0.000	0.006	0.1971	0.5690	0.0001	5.15E-07
108		0.00	0.000	0.001	0.1970	0.5688	0.0001	5.15E-07
109		1.45	0.691	0.043	0.2133	0.5686	0.0001	5.15E-07
110		0.00	0.170	0.097	0.2249	0.5684	0.0001	5.15E-07
111		0.01	0.000	0.088	0.2339	0.5682	0.0001	5.14E-07
112		0.14	0.000	0.144	0.2330	0.5680	0.0001	5.14E-07
113		0.22	0.035	0.080	0.2403	0.5678	0.0001	5.14E-07
114		0.02	0.000	0.233	0.2220	0.5676	0.0001	5.14E-07
115		0.00	0.000	0.090	0.2130	0.5674	0.0001	5.14E-07
116		0.00	0.000	0.123	0.2007	0.5672	0.0001	5.14E-07
117		0.00	0.000	0.032	0.1976	0.5670	0.0001	5.13E-07
118		0.06	0.000	0.023	0.2012	0.5668	0.0001	5.13E-07
119		0.00	0.000	0.008	0.2004	0.5666	0.0001	5.13E-07
120		0.00	0.000	0.015	0.1989	0.5664	0.0001	5.13E-07

121	0.00	0.000	0.008	0.1981	0.5662	0.0001	5.13E-07
122	0.00	0.000	0.008	0.1973	0.5660	0.0001	5.13E-07
123	0.05	0.000	0.014	0.2014	0.5658	0.0001	5.12E-07
124	0.59	0.213	0.038	0.2138	0.5656	0.0001	5.12E-07
125	0.00	0.000	0.137	0.2211	0.5654	0.0001	5.12E-07
126	0.00	0.000	0.042	0.2169	0.5652	0.0001	5.12E-07
127	0.07	0.000	0.056	0.2186	0.5650	0.0001	5.12E-07
128	0.04	0.000	0.158	0.2065	0.5648	0.0001	5.12E-07
129	0.56	0.048	0.338	0.2195	0.5646	0.0001	5.11E-07
130	0.06	0.000	0.163	0.2133	0.5644	0.0001	5.11E-07
131	1.95	0.968	0.193	0.2263	0.5642	0.0001	5.11E-07
132	0.28	0.308	0.210	0.2379	0.5640	0.0001	5.11E-07
133	1.43	0.756	0.358	0.2495	0.5638	0.0001	5.11E-07
134	0.01	0.000	0.395	0.2611	0.5636	0.0001	5.11E-07
135	0.00	0.000	0.205	0.2406	0.5634	0.0001	5.10E-07
136	0.00	0.000	0.228	0.2178	0.5632	0.0001	5.10E-07
137	0.00	0.000	0.189	0.1989	0.5630	0.0001	5.10E-07
138	0.00	0.000	0.010	0.1980	0.5628	0.0001	5.10E-07
139	0.00	0.000	0.010	0.1970	0.5626	0.0001	5.10E-07
140	0.00	0.000	0.000	0.1970	0.5624	0.0001	5.10E-07
141	0.19	0.020	0.027	0.2090	0.5622	0.0001	5.09E-07
142	0.00	0.000	0.036	0.2074	0.5620	0.0001	5.09E-07
143	0.00	0.000	0.023	0.2052	0.5618	0.0001	5.09E-07
144	0.24	0.043	0.032	0.2173	0.5616	0.0001	5.09E-07
145	0.14	0.002	0.094	0.2255	0.5614	0.0001	5.09E-07
146	0.02	0.000	0.122	0.2150	0.5612	0.0001	5.09E-07
147	0.64	0.170	0.153	0.2303	0.5611	0.0001	5.09E-07
148	0.00	0.000	0.185	0.2281	0.5609	0.0001	5.08E-07
149	0.00	0.000	0.225	0.2056	0.5607	0.0001	5.08E-07
150	0.00	0.000	0.075	0.1981	0.5605	0.0001	5.08E-07
151	0.00	0.000	0.010	0.1975	0.5603	0.0001	5.08E-07
152	0.02	0.000	0.016	0.1984	0.5601	0.0001	5.08E-07

153	0.28	0.045	0.051	0.2117	0.5599	0.0001	5.08E-07
154	0.00	0.000	0.061	0.2101	0.5599	0.0001	5.08E-07
155	0.00	0.000	0.024	0.2077	0.5599	0.0001	5.08E-07
156	0.00	0.000	0.022	0.2055	0.5597	0.0001	5.07E-07
157	0.00	0.000	0.019	0.2036	0.5595	0.0001	5.07E-07
158	0.00	0.000	0.019	0.2016	0.5593	0.0001	5.07E-07
159	0.00	0.000	0.019	0.1997	0.5591	0.0001	5.07E-07
160	0.10	0.000	0.027	0.2069	0.5589	0.0001	5.07E-07
161	0.02	0.000	0.028	0.2059	0.5587	0.0001	5.07E-07
162	0.00	0.000	0.015	0.2044	0.5585	0.0001	5.06E-07
163	0.00	0.000	0.013	0.2031	0.5583	0.0001	5.06E-07
164	0.00	0.000	0.015	0.2017	0.5581	0.0001	5.06E-07
165	0.00	0.000	0.015	0.2002	0.5579	0.0001	5.06E-07
166	0.03	0.000	0.023	0.2010	0.5577	0.0001	5.06E-07
167	0.00	0.000	0.010	0.2000	0.5575	0.0001	5.06E-07
168	0.00	0.000	0.008	0.1991	0.5573	0.0001	5.05E-07
169	0.00	0.000	0.004	0.1987	0.5572	0.0001	5.05E-07
170	0.00	0.000	0.004	0.1983	0.5570	0.0001	5.05E-07
171	0.00	0.000	0.003	0.1980	0.5568	0.0001	5.05E-07
172	0.00	0.000	0.004	0.1976	0.5566	0.0001	5.05E-07
173	0.01	0.000	0.010	0.1978	0.5564	0.0001	5.05E-07
174	0.00	0.000	0.002	0.1975	0.5562	0.0001	5.04E-07
175	0.78	0.306	0.026	0.2133	0.5560	0.0001	5.04E-07
176	0.00	0.000	0.215	0.2208	0.5558	0.0001	5.04E-07
177	0.00	0.000	0.122	0.2087	0.5556	0.0001	5.04E-07
178	0.00	0.000	0.097	0.1990	0.5554	0.0001	5.04E-07
179	0.00	0.000	0.020	0.1970	0.5552	0.0001	5.04E-07
180	0.00	0.000	0.000	0.1970	0.5550	0.0001	5.03E-07
181	0.00	0.000	0.000	0.1970	0.5548	0.0001	5.03E-07
182	0.07	0.000	0.014	0.2026	0.5546	0.0001	5.03E-07
183	0.06	0.000	0.027	0.2061	0.5544	0.0001	5.03E-07
184	0.00	0.000	0.022	0.2039	0.5542	0.0001	5.03E-07

185	0.46	0.140	0.040	0.2181	0.5540	0.0001	5.03E-07
186	0.02	0.000	0.127	0.2210	0.5538	0.0001	5.03E-07
187	0.06	0.000	0.070	0.2196	0.5536	0.0001	5.02E-07
188	0.53	0.089	0.234	0.2318	0.5535	0.0001	5.02E-07
189	0.00	0.000	0.221	0.2181	0.5533	0.0001	5.02E-07
190	0.00	0.000	0.156	0.2025	0.5531	0.0001	5.02E-07
191	0.00	0.000	0.049	0.1976	0.5529	0.0001	5.02E-07
192	0.00	0.000	0.003	0.1973	0.5527	0.0001	5.02E-07
193	0.00	0.000	0.001	0.1971	0.5525	0.0001	5.01E-07
194	0.00	0.000	0.001	0.1970	0.5523	0.0001	5.01E-07
195	0.00	0.000	0.000	0.1970	0.5521	0.0001	5.01E-07
196	0.00	0.000	0.000	0.1970	0.5519	0.0001	5.01E-07
197	0.05	0.000	0.013	0.2007	0.5517	0.0001	5.01E-07
198	1.03	0.460	0.041	0.2129	0.5515	0.0001	5.01E-07
199	0.04	0.089	0.150	0.2245	0.5513	0.0001	5.00E-07
200	0.00	0.000	0.119	0.2216	0.5511	0.0001	5.00E-07
201	0.00	0.000	0.097	0.2119	0.5509	0.0001	5.00E-07
202	0.26	0.033	0.206	0.2108	0.5507	0.0001	5.00E-07
203	0.96	0.358	0.213	0.2225	0.5506	0.0001	5.00E-07
204	0.00	0.000	0.252	0.2281	0.5504	0.0001	5.00E-07
205	0.00	0.000	0.205	0.2076	0.5502	0.0001	4.99E-07
206	0.01	0.000	0.088	0.1999	0.5500	0.0001	4.99E-07
207	0.00	0.000	0.027	0.1972	0.5498	0.0001	4.99E-07
208	0.00	0.000	0.002	0.1970	0.5496	0.0001	4.99E-07
209	0.00	0.000	0.000	0.1970	0.5494	0.0001	4.99E-07
210	0.62	0.203	0.060	0.2129	0.5492	0.0001	4.99E-07
211	0.80	0.382	0.147	0.2245	0.5490	0.0001	4.99E-07
212	0.00	0.000	0.290	0.2309	0.5488	0.0001	4.98E-07
213	0.00	0.000	0.114	0.2195	0.5486	0.0001	4.98E-07
214	0.00	0.000	0.172	0.2023	0.5484	0.0001	4.98E-07
215	0.00	0.000	0.040	0.1983	0.5482	0.0001	4.98E-07
216	0.00	0.000	0.008	0.1975	0.5480	0.0001	4.98E-07

217	0.00	0.000	0.003	0.1972	0.5479	0.0001	4.98E-07
218	0.00	0.000	0.002	0.1970	0.5477	0.0001	4.97E-07
219	0.00	0.000	0.000	0.1970	0.5475	0.0001	4.97E-07
220	0.00	0.000	0.000	0.1970	0.5473	0.0001	4.97E-07
221	0.00	0.000	0.000	0.1970	0.5471	0.0001	4.97E-07
222	0.00	0.000	0.000	0.1970	0.5469	0.0001	4.97E-07
223	0.00	0.000	0.000	0.1970	0.5467	0.0001	4.97E-07
224	0.00	0.000	0.000	0.1970	0.5465	0.0001	4.96E-07
225	0.00	0.000	0.000	0.1970	0.5463	0.0001	4.96E-07
226	0.00	0.000	0.000	0.1970	0.5461	0.0001	4.96E-07
227	0.90	0.369	0.035	0.2131	0.5459	0.0001	4.96E-07
228	0.25	0.065	0.344	0.2247	0.5457	0.0001	4.96E-07
229	0.00	0.000	0.124	0.2188	0.5456	0.0001	4.96E-07
230	0.00	0.000	0.083	0.2105	0.5454	0.0001	4.95E-07
231	0.00	0.000	0.080	0.2025	0.5452	0.0001	4.95E-07
232	0.18	0.000	0.140	0.2062	0.5450	0.0001	4.95E-07
233	1.20	0.519	0.143	0.2178	0.5448	0.0001	4.95E-07
234	0.00	0.070	0.167	0.2294	0.5446	0.0001	4.95E-07
235	0.00	0.000	0.178	0.2186	0.5444	0.0001	4.95E-07
236	0.14	0.000	0.105	0.2224	0.5442	0.0001	4.95E-07
237	0.00	0.000	0.164	0.2059	0.5440	0.0001	4.94E-07
238	0.41	0.061	0.147	0.2196	0.5438	0.0001	4.94E-07
239	0.00	0.000	0.214	0.2044	0.5436	0.0001	4.94E-07
240	0.39	0.057	0.140	0.2177	0.5438	0.0001	4.94E-07
241	0.17	0.012	0.231	0.2153	0.5438	0.0001	4.94E-07
242	0.22	0.026	0.182	0.2156	0.5436	0.0001	4.94E-07
243	0.02	0.000	0.162	0.2037	0.5434	0.0001	4.94E-07
244	0.00	0.000	0.050	0.1987	0.5432	0.0001	4.94E-07
245	0.00	0.000	0.017	0.1970	0.5431	0.0001	4.94E-07
246	0.42	0.098	0.074	0.2125	0.5429	0.0001	4.93E-07
247	0.13	0.002	0.110	0.2241	0.5427	0.0001	4.93E-07
248	0.44	0.125	0.085	0.2355	0.5425	0.0001	4.93E-07

249	0.18	0.054	0.079	0.2471	0.5423	0.0001	4.93E-07
250	0.00	0.000	0.181	0.2344	0.5421	0.0001	4.93E-07
251	0.00	0.000	0.122	0.2222	0.5419	0.0001	4.93E-07
252	0.00	0.000	0.226	0.1996	0.5417	0.0001	4.92E-07
253	0.00	0.000	0.013	0.1983	0.5415	0.0001	4.92E-07
254	0.00	0.000	0.007	0.1977	0.5413	0.0001	4.92E-07
255	0.00	0.000	0.007	0.1970	0.5412	0.0001	4.92E-07
256	0.00	0.000	0.000	0.1970	0.5410	0.0001	4.92E-07
257	0.60	0.196	0.055	0.2128	0.5408	0.0001	4.92E-07
258	0.75	0.351	0.144	0.2245	0.5406	0.0001	4.92E-07
259	0.13	0.108	0.132	0.2361	0.5404	0.0001	4.91E-07
260	0.03	0.000	0.122	0.2381	0.5402	0.0001	4.91E-07
261	0.00	0.000	0.049	0.2332	0.5400	0.0001	4.91E-07
262	0.00	0.000	0.098	0.2234	0.5398	0.0001	4.91E-07
263	0.00	0.000	0.143	0.2091	0.5396	0.0001	4.91E-07
264	0.00	0.000	0.070	0.2021	0.5394	0.0001	4.91E-07
265	0.34	0.043	0.235	0.2034	0.5393	0.0001	4.90E-07
266	0.00	0.000	0.066	0.2012	0.5391	0.0001	4.90E-07
267	0.00	0.000	0.032	0.1980	0.5389	0.0001	4.90E-07
268	0.00	0.000	0.008	0.1972	0.5387	0.0001	4.90E-07
269	0.05	0.000	0.028	0.1990	0.5385	0.0001	4.90E-07
270	0.00	0.000	0.007	0.1983	0.5383	0.0001	4.90E-07
271	1.58	0.763	0.071	0.2139	0.5381	0.0001	4.89E-07
272	0.00	0.135	0.205	0.2256	0.5379	0.0001	4.89E-07
273	0.00	0.000	0.170	0.2221	0.5377	0.0001	4.89E-07
274	0.00	0.000	0.087	0.2135	0.5376	0.0001	4.89E-07
275	0.00	0.000	0.088	0.2047	0.5374	0.0001	4.89E-07
276	0.00	0.000	0.059	0.1988	0.5372	0.0001	4.89E-07
277	0.00	0.000	0.016	0.1971	0.5370	0.0001	4.89E-07
278	0.00	0.000	0.001	0.1971	0.5368	0.0001	4.88E-07
279	0.00	0.000	0.001	0.1970	0.5366	0.0001	4.88E-07
280	0.18	0.016	0.037	0.2084	0.5364	0.0001	4.88E-07

281		0.00	0.000	0.041	0.2059	0.5362	0.0001	4.88E-07
282	*	0.00	0.000	0.028	0.2031	0.5361	0.0001	4.88E-07
283		0.00	0.000	0.027	0.2004	0.5359	0.0001	4.88E-07
284		0.00	0.000	0.021	0.1984	0.5357	0.0001	4.87E-07
285		0.24	0.048	0.035	0.2096	0.5355	0.0001	4.87E-07
286		0.00	0.000	0.099	0.2046	0.5353	0.0001	4.87E-07
287		0.00	0.000	0.020	0.2025	0.5351	0.0001	4.87E-07
288		0.00	0.000	0.020	0.2006	0.5349	0.0001	4.87E-07
289		0.00	0.000	0.014	0.1992	0.5347	0.0001	4.87E-07
290		0.09	0.000	0.030	0.2050	0.5346	0.0001	4.86E-07
291	*	0.00	0.000	0.014	0.2036	0.5344	0.0001	4.86E-07
292	*	0.00	0.000	0.010	0.2026	0.5342	0.0001	4.86E-07
293		0.00	0.000	0.013	0.2013	0.5340	0.0001	4.86E-07
294		0.00	0.000	0.013	0.2000	0.5338	0.0001	4.86E-07
295		0.00	0.000	0.013	0.1987	0.5336	0.0001	4.86E-07
296		0.00	0.000	0.008	0.1979	0.5334	0.0001	4.86E-07
297	*	1.89	0.000	0.000	0.1998	0.5332	0.0001	4.85E-07
298		0.04	0.218	0.000	0.2136	0.5331	0.0001	4.85E-07
299		0.00	0.315	0.000	0.2252	0.5329	0.0001	4.85E-07
300	*	0.00	0.062	0.000	0.2368	0.5327	0.0001	4.85E-07
301	*	0.42	0.000	0.033	0.2389	0.5325	0.0001	4.85E-07
302		0.11	0.287	0.000	0.2516	0.5323	0.0001	4.85E-07
303		0.01	0.549	0.000	0.2632	0.5321	0.0001	4.84E-07
304		0.00	0.069	0.106	0.2748	0.5319	0.0001	4.84E-07
305	*	0.00	0.000	0.043	0.2748	0.5317	0.0001	4.84E-07
306		0.00	0.000	0.000	0.2748	0.5316	0.0001	4.84E-07
307		1.04	0.539	0.000	0.2879	0.5314	0.0001	4.84E-07
308		0.00	0.000	0.000	0.2879	0.5312	0.0001	4.84E-07
309		0.00	0.000	0.000	0.2879	0.5310	0.0001	4.84E-07
310		0.00	0.000	0.000	0.2880	0.5308	0.0001	4.83E-07
311		0.00	0.000	0.000	0.2880	0.5306	0.0001	4.83E-07
312		0.00	0.000	0.000	0.2880	0.5304	0.0001	4.83E-07

313		0.00	0.000	0.000	0.2880	0.5303	0.0001	4.83E-07
314		0.00	0.000	0.000	0.2880	0.5301	0.0001	4.83E-07
315		0.21	0.039	0.000	0.3016	0.5299	0.0001	4.83E-07
316		0.09	0.000	0.000	0.3102	0.5297	0.0001	4.82E-07
317		0.00	0.000	0.000	0.3102	0.5295	0.0001	4.82E-07
318		0.00	0.000	0.000	0.3102	0.5293	0.0001	4.82E-07
319		0.00	0.000	0.000	0.3102	0.5291	0.0001	4.82E-07
320		0.00	0.000	0.000	0.3102	0.5290	0.0001	4.82E-07
321		0.00	0.000	0.000	0.3102	0.5288	0.0001	4.82E-07
322		0.00	0.000	0.000	0.3102	0.5286	0.0001	4.82E-07
323		0.01	0.000	0.000	0.3110	0.5284	0.0001	4.81E-07
324	*	1.40	0.144	0.000	0.3240	0.5282	0.0001	4.81E-07
325	*	0.00	0.004	0.026	0.3357	0.5280	0.0001	4.81E-07
326		0.00	0.874	0.000	0.3473	0.5278	0.0001	4.81E-07
327		0.00	0.061	0.187	0.3589	0.5277	0.0001	4.81E-07
328		0.00	0.000	0.134	0.3516	0.5275	0.0001	4.81E-07
329		0.00	0.000	0.149	0.3367	0.5273	0.0001	4.80E-07
330		0.00	0.000	0.065	0.3267	0.5553	0.0001	5.04E-07
331		0.00	0.000	0.120	0.3106	0.6794	0.0001	6.06E-07
332		0.00	0.000	0.129	0.2976	0.7606	0.0001	6.72E-07
333		0.06	0.000	0.130	0.2904	0.7603	0.0001	6.72E-07
334		0.00	0.000	0.099	0.2805	0.7601	0.0001	6.71E-07
335		0.00	0.000	0.099	0.2706	0.7598	0.0001	6.71E-07
336		0.00	0.000	0.103	0.2603	0.7595	0.0001	6.71E-07
337		0.00	0.000	0.058	0.2545	0.7593	0.0001	6.71E-07
338		0.00	0.000	0.045	0.2500	0.7590	0.0001	6.70E-07
339		0.00	0.000	0.038	0.2463	0.7587	0.0001	6.70E-07
340		0.14	0.000	0.041	0.2561	0.7585	0.0001	6.70E-07
341		0.00	0.000	0.030	0.2531	0.7582	0.0001	6.70E-07
342		0.19	0.023	0.034	0.2646	0.7579	0.0001	6.70E-07
343		0.00	0.000	0.048	0.2620	0.7577	0.0001	6.69E-07
344	*	0.00	0.000	0.024	0.2596	0.7574	0.0001	6.69E-07

345		0.00	0.000	0.023	0.2574	0.7571	0.0001	6.69E-07
346		0.01	0.000	0.026	0.2555	0.7569	0.0001	6.69E-07
347		0.01	0.000	0.025	0.2538	0.7566	0.0001	6.69E-07
348		0.00	0.000	0.020	0.2518	0.7563	0.0001	6.68E-07
349		0.45	0.140	0.025	0.2660	0.7561	0.0001	6.68E-07
350		0.00	0.000	0.152	0.2648	0.7558	0.0001	6.68E-07
351		0.00	0.000	0.115	0.2534	0.7555	0.0001	6.68E-07
352		0.00	0.000	0.059	0.2475	0.7553	0.0001	6.67E-07
353	*	0.00	0.000	0.000	0.2475	0.7550	0.0001	6.67E-07
354		0.01	0.000	0.076	0.2400	0.7594	0.0001	6.71E-07
355		0.23	0.042	0.064	0.2480	0.7733	0.0001	6.82E-07
356		0.00	0.000	0.162	0.2360	0.7730	0.0001	6.82E-07
357		0.00	0.000	0.043	0.2318	0.7727	0.0001	6.82E-07
358	*	0.00	0.000	0.000	0.2318	0.7725	0.0001	6.81E-07
359	*	0.25	0.000	0.013	0.2338	0.7722	0.0001	6.81E-07
360	*	0.00	0.000	0.010	0.2357	0.7719	0.0001	6.81E-07
361		0.00	0.000	0.047	0.2377	0.7717	0.0001	6.81E-07
362		0.02	0.000	0.086	0.2428	0.7714	0.0001	6.80E-07
363		0.10	0.000	0.121	0.2408	0.7711	0.0001	6.80E-07
364		0.00	0.000	0.092	0.2296	0.8091	0.0001	7.11E-07
365	*	0.00	0.000	0.053	0.2244	0.8314	0.0001	7.29E-07

* = Frozen (air or soil)

Annual Totals for Year 4			
	inches	cubic feet	percent
Precipitation	42.01	152,505.5	100.00
Runoff	17.195	62,419.2	40.93
Evapotranspiration	25.282	91,774.1	60.18
Recirculation into Layer 1	0.0239	86.8	0.06
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0239	86.8	0.06
Percolation/Leakage through Layer 5	0.000191	0.6921	0.00
Average Head on Top of Layer 4	0.5764	---	---
Change in Water Storage	-0.4652	-1,688.6	-1.11
Soil Water at Start of Year	293.2337	1,064,438.3	697.97
Soil Water at End of Year	293.4865	1,065,356.1	698.57
Snow Water at Start of Year	0.7180	2,606.3	1.71
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0239	-86.7	-0.06

Daily Output for Year 5

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.000	0.2244	0.8308	0.0001	7.28E-07
2	*		0.00	0.000	0.049	0.2182	0.8494	0.0001	7.43E-07
3			0.00	0.000	0.045	0.2138	0.8679	0.0001	7.58E-07
4			0.00	0.000	0.036	0.2102	0.8676	0.0001	7.58E-07
5	*		0.00	0.000	0.000	0.2102	0.8673	0.0001	7.58E-07
6			0.00	0.000	0.033	0.2061	0.8767	0.0001	7.65E-07
7			0.00	0.000	0.030	0.2031	0.8926	0.0001	7.78E-07
8			0.00	0.000	0.028	0.2003	0.8923	0.0001	7.78E-07
9	*		0.00	0.000	0.000	0.2003	0.8920	0.0001	7.77E-07
10	*		0.00	0.000	0.019	0.1970	0.9171	0.0001	7.97E-07
11			0.00	0.000	0.000	0.1970	0.9345	0.0001	8.11E-07
12			0.00	0.000	0.000	0.1970	0.9341	0.0001	8.11E-07
13	*		0.00	0.000	0.000	0.1970	0.9338	0.0001	8.11E-07
14			0.00	0.000	0.000	0.1970	0.9335	0.0001	8.10E-07
15			0.00	0.000	0.000	0.1970	0.9332	0.0001	8.10E-07
16			0.00	0.000	0.000	0.1970	0.9328	0.0001	8.10E-07
17			0.00	0.000	0.000	0.1970	0.9325	0.0001	8.10E-07
18	*		0.00	0.000	0.000	0.1970	0.9322	0.0001	8.09E-07
19			0.00	0.000	0.000	0.1970	0.9318	0.0001	8.09E-07
20	*		0.00	0.000	0.000	0.1970	0.9315	0.0001	8.09E-07
21	*		0.00	0.000	0.000	0.1970	0.9312	0.0001	8.09E-07
22	*		0.00	0.000	0.000	0.1970	0.9309	0.0001	8.08E-07
23			0.00	0.000	0.000	0.1970	0.9305	0.0001	8.08E-07
24	*		0.00	0.000	0.000	0.1970	0.9302	0.0001	8.08E-07

25	*	0.00	0.000	0.000	0.1970	0.9299	0.0001	8.08E-07
26	*	0.00	0.000	0.000	0.1970	0.9296	0.0001	8.07E-07
27		0.00	0.000	0.000	0.1970	0.9293	0.0001	8.07E-07
28		0.00	0.000	0.000	0.1970	0.9289	0.0001	8.07E-07
29		0.00	0.000	0.000	0.1970	0.9286	0.0001	8.07E-07
30	*	0.00	0.000	0.000	0.1970	0.9283	0.0001	8.06E-07
31		0.00	0.000	0.000	0.1970	0.9280	0.0001	8.06E-07
32	*	0.02	0.000	0.018	0.1970	0.9276	0.0001	8.06E-07
33		0.48	0.147	0.018	0.2133	0.9273	0.0001	8.05E-07
34		0.00	0.000	0.111	0.2170	0.9270	0.0001	8.05E-07
35		0.00	0.000	0.007	0.2163	0.9267	0.0001	8.05E-07
36		0.00	0.000	0.009	0.2153	0.9263	0.0001	8.05E-07
37		0.00	0.000	0.009	0.2144	0.9260	0.0001	8.04E-07
38		0.00	0.000	0.009	0.2136	0.9257	0.0001	8.04E-07
39		0.00	0.000	0.009	0.2127	0.9254	0.0001	8.04E-07
40		0.00	0.000	0.008	0.2119	0.9250	0.0001	8.04E-07
41		0.00	0.000	0.008	0.2111	0.9247	0.0001	8.03E-07
42		0.00	0.000	0.008	0.2103	0.9244	0.0001	8.03E-07
43		0.00	0.000	0.008	0.2095	0.9241	0.0001	8.03E-07
44		0.27	0.053	0.016	0.2241	0.9237	0.0001	8.03E-07
45		0.00	0.000	0.061	0.2233	0.9234	0.0001	8.02E-07
46		0.00	0.000	0.008	0.2226	0.9231	0.0001	8.02E-07
47	*	0.00	0.000	0.000	0.2226	0.9228	0.0001	8.02E-07
48		0.00	0.000	0.008	0.2218	0.9224	0.0001	8.02E-07
49		0.00	0.000	0.008	0.2211	0.9221	0.0001	8.01E-07
50		0.00	0.000	0.007	0.2203	0.9218	0.0001	8.01E-07
51	*	0.00	0.000	0.000	0.2203	0.9215	0.0001	8.01E-07
52	*	0.00	0.000	0.000	0.2204	0.9212	0.0001	8.01E-07
53	*	0.35	0.000	0.028	0.2223	0.9208	0.0001	8.00E-07
54	*	0.00	0.000	0.031	0.2243	0.9205	0.0001	8.00E-07
55	*	0.00	0.000	0.030	0.2263	0.9202	0.0001	8.00E-07
56	*	0.00	0.000	0.031	0.2283	0.9199	0.0001	8.00E-07

57	*	0.00	0.000	0.013	0.2303	0.9195	0.0001	7.99E-07
58	*	0.12	0.000	0.008	0.2322	0.9192	0.0001	7.99E-07
59	*	0.02	0.000	0.000	0.2342	0.9189	0.0001	7.99E-07
60	*	0.00	0.000	0.074	0.2362	0.9186	0.0001	7.99E-07
61	*	0.38	0.000	0.026	0.2382	0.9183	0.0001	7.98E-07
62		0.00	0.071	0.034	0.2509	0.9179	0.0001	7.98E-07
63		0.00	0.000	0.114	0.2619	0.9176	0.0001	7.98E-07
64		0.00	0.000	0.133	0.2486	0.9173	0.0001	7.97E-07
65		0.00	0.000	0.151	0.2335	0.9170	0.0001	7.97E-07
66		0.39	0.049	0.158	0.2469	0.9166	0.0001	7.97E-07
67		0.00	0.000	0.168	0.2355	0.9163	0.0001	7.97E-07
68		0.00	0.000	0.100	0.2255	0.9160	0.0001	7.96E-07
69		0.00	0.000	0.149	0.2106	0.9157	0.0001	7.96E-07
70		0.00	0.000	0.122	0.1984	0.9156	0.0001	7.96E-07
71		0.00	0.000	0.007	0.1977	0.9159	0.0001	7.96E-07
72		0.00	0.000	0.007	0.1970	0.9156	0.0001	7.96E-07
73		0.00	0.000	0.000	0.1970	0.9153	0.0001	7.96E-07
74		0.00	0.000	0.000	0.1970	0.9149	0.0001	7.96E-07
75		0.00	0.000	0.000	0.1970	0.9146	0.0001	7.95E-07
76		0.00	0.000	0.000	0.1970	0.9143	0.0001	7.95E-07
77		0.00	0.000	0.003	0.1970	0.9140	0.0001	7.95E-07
78		0.01	0.000	0.005	0.1970	0.9137	0.0001	7.95E-07
79		0.00	0.000	0.000	0.1970	0.9133	0.0001	7.94E-07
80		0.00	0.000	0.000	0.1970	0.9130	0.0001	7.94E-07
81		0.00	0.000	0.000	0.1970	0.9127	0.0001	7.94E-07
82		0.25	0.052	0.015	0.2097	0.9124	0.0001	7.94E-07
83	*	0.64	0.000	0.033	0.2119	0.9121	0.0001	7.93E-07
84		0.00	0.000	0.055	0.2140	0.9117	0.0001	7.93E-07
85		0.00	0.177	0.086	0.2267	0.9114	0.0001	7.93E-07
86		0.00	0.000	0.175	0.2265	0.9111	0.0001	7.93E-07
87		0.00	0.000	0.071	0.2195	0.9108	0.0001	7.92E-07
88		0.00	0.000	0.110	0.2085	0.9105	0.0001	7.92E-07

89		0.00	0.000	0.070	0.2015	0.9101	0.0001	7.92E-07
90		0.00	0.000	0.033	0.1981	0.9098	0.0001	7.92E-07
91		0.00	0.000	0.006	0.1976	0.9095	0.0001	7.91E-07
92		0.00	0.000	0.003	0.1973	0.9092	0.0001	7.91E-07
93		0.06	0.000	0.010	0.2021	0.9089	0.0001	7.91E-07
94		0.62	0.226	0.035	0.2158	0.9086	0.0001	7.91E-07
95		0.00	0.000	0.135	0.2244	0.9082	0.0001	7.90E-07
96		0.00	0.000	0.080	0.2164	0.9079	0.0001	7.90E-07
97		0.00	0.000	0.119	0.2045	0.9076	0.0001	7.90E-07
98		0.00	0.000	0.068	0.1977	0.9073	0.0001	7.90E-07
99		0.01	0.000	0.015	0.1973	0.9070	0.0001	7.89E-07
100	*	1.41	0.000	0.042	0.1993	0.9066	0.0001	7.89E-07
101		0.00	0.318	0.000	0.2136	0.9063	0.0001	7.89E-07
102		0.08	0.393	0.120	0.2252	0.9060	0.0001	7.88E-07
103		0.00	0.000	0.249	0.2344	0.9057	0.0001	7.88E-07
104		0.00	0.000	0.095	0.2250	0.9054	0.0001	7.88E-07
105		0.00	0.000	0.090	0.2160	0.9051	0.0001	7.88E-07
106		0.51	0.140	0.080	0.2310	0.9047	0.0001	7.87E-07
107		0.00	0.000	0.148	0.2301	0.9044	0.0001	7.87E-07
108		0.00	0.000	0.266	0.2036	0.9041	0.0001	7.87E-07
109		0.00	0.000	0.057	0.1979	0.9038	0.0001	7.87E-07
110		0.00	0.000	0.010	0.1973	0.9035	0.0001	7.86E-07
111		0.00	0.000	0.003	0.1970	0.9032	0.0001	7.86E-07
112		0.00	0.000	0.000	0.1970	0.9028	0.0001	7.86E-07
113		0.01	0.000	0.008	0.1973	0.9025	0.0001	7.86E-07
114		0.02	0.000	0.008	0.1986	0.9022	0.0001	7.85E-07
115		0.02	0.000	0.008	0.1997	0.9019	0.0001	7.85E-07
116		0.45	0.138	0.035	0.2133	0.9016	0.0001	7.85E-07
117		0.01	0.000	0.145	0.2139	0.9013	0.0001	7.85E-07
118	*	0.00	0.000	0.000	0.2139	0.9009	0.0001	7.84E-07
119		0.00	0.000	0.075	0.2064	0.9006	0.0001	7.84E-07
120		0.49	0.096	0.146	0.2216	0.9003	0.0001	7.84E-07

121	0.06	0.000	0.234	0.2142	0.9000	0.0001	7.84E-07
122	0.30	0.028	0.236	0.2149	0.8997	0.0001	7.83E-07
123	0.00	0.000	0.128	0.2049	0.8994	0.0001	7.83E-07
124	0.00	0.000	0.050	0.2000	0.8991	0.0001	7.83E-07
125	0.19	0.024	0.053	0.2090	0.8987	0.0001	7.83E-07
126	0.20	0.037	0.051	0.2188	0.8984	0.0001	7.82E-07
127	0.00	0.000	0.103	0.2122	0.8981	0.0001	7.82E-07
128	0.01	0.000	0.032	0.2104	0.8978	0.0001	7.82E-07
129	1.06	0.474	0.039	0.2238	0.8975	0.0001	7.82E-07
130	0.06	0.121	0.121	0.2354	0.8972	0.0001	7.81E-07
131	0.00	0.000	0.129	0.2346	0.8969	0.0001	7.81E-07
132	0.00	0.000	0.157	0.2189	0.8965	0.0001	7.81E-07
133	0.00	0.000	0.207	0.1982	0.8962	0.0001	7.81E-07
134	0.03	0.000	0.021	0.1989	0.8959	0.0001	7.80E-07
135	0.00	0.000	0.010	0.1979	0.8956	0.0001	7.80E-07
136	0.00	0.000	0.007	0.1972	0.8953	0.0001	7.80E-07
137	0.00	0.000	0.001	0.1970	0.8950	0.0001	7.80E-07
138	0.00	0.000	0.000	0.1970	0.8947	0.0001	7.79E-07
139	0.00	0.000	0.000	0.1970	0.8943	0.0001	7.79E-07
140	0.00	0.000	0.000	0.1970	0.8940	0.0001	7.79E-07
141	0.00	0.000	0.000	0.1970	0.8937	0.0001	7.79E-07
142	0.00	0.000	0.000	0.1970	0.8934	0.0001	7.78E-07
143	0.00	0.000	0.000	0.1970	0.8931	0.0001	7.78E-07
144	0.00	0.000	0.000	0.1970	0.8928	0.0001	7.78E-07
145	0.00	0.000	0.000	0.1970	0.8925	0.0001	7.78E-07
146	0.00	0.000	0.000	0.1970	0.8921	0.0001	7.77E-07
147	0.00	0.000	0.000	0.1970	0.8918	0.0001	7.77E-07
148	0.00	0.000	0.000	0.1970	0.8915	0.0001	7.77E-07
149	0.05	0.000	0.007	0.2013	0.8912	0.0001	7.77E-07
150	0.08	0.000	0.012	0.2086	0.8909	0.0001	7.76E-07
151	0.10	0.000	0.013	0.2175	0.8906	0.0001	7.76E-07
152	0.29	0.067	0.023	0.2303	0.8903	0.0001	7.76E-07

153	1.93	1.110	0.090	0.2419	0.8900	0.0001	7.76E-07
154	0.01	0.222	0.130	0.2535	0.8897	0.0001	7.75E-07
155	0.00	0.000	0.215	0.2543	0.8893	0.0001	7.75E-07
156	0.00	0.000	0.354	0.2189	0.8890	0.0001	7.75E-07
157	0.00	0.000	0.186	0.2003	0.8887	0.0001	7.75E-07
158	0.00	0.000	0.025	0.1978	0.8884	0.0001	7.74E-07
159	0.00	0.000	0.006	0.1972	0.8883	0.0001	7.74E-07
160	0.06	0.000	0.012	0.2021	0.8880	0.0001	7.74E-07
161	0.00	0.000	0.020	0.2001	0.8877	0.0001	7.74E-07
162	0.72	0.269	0.043	0.2147	0.8874	0.0001	7.74E-07
163	0.00	0.000	0.288	0.2117	0.8871	0.0001	7.73E-07
164	0.00	0.000	0.104	0.2013	0.8868	0.0001	7.73E-07
165	0.39	0.057	0.147	0.2146	0.8865	0.0001	7.73E-07
166	0.22	0.034	0.158	0.2198	0.8862	0.0001	7.73E-07
167	0.24	0.024	0.242	0.2187	0.8859	0.0001	7.72E-07
168	0.76	0.130	0.444	0.2302	0.8855	0.0001	7.72E-07
169	0.38	0.074	0.217	0.2419	0.8852	0.0001	7.72E-07
170	0.93	0.415	0.176	0.2535	0.8849	0.0001	7.72E-07
171	0.17	0.087	0.170	0.2651	0.8846	0.0001	7.71E-07
172	1.47	0.846	0.148	0.2767	0.8843	0.0001	7.71E-07
173	0.00	0.046	0.240	0.2884	0.8840	0.0001	7.71E-07
174	0.00	0.000	0.384	0.2546	0.8837	0.0001	7.71E-07
175	0.03	0.000	0.286	0.2294	0.8834	0.0001	7.70E-07
176	0.00	0.000	0.283	0.2011	0.8831	0.0001	7.70E-07
177	1.34	0.569	0.149	0.2170	0.8828	0.0001	7.70E-07
178	0.00	0.012	0.318	0.2286	0.8825	0.0001	7.70E-07
179	0.00	0.000	0.186	0.2109	0.8852	0.0001	7.72E-07
180	0.00	0.000	0.117	0.1992	0.8939	0.0001	7.79E-07
181	0.00	0.000	0.021	0.1971	0.8936	0.0001	7.79E-07
182	0.19	0.017	0.066	0.2056	0.8932	0.0001	7.78E-07
183	0.33	0.074	0.083	0.2170	0.8929	0.0001	7.78E-07
184	0.01	0.000	0.181	0.2073	0.8926	0.0001	7.78E-07

185	0.00	0.000	0.034	0.2039	0.8923	0.0001	7.78E-07
186	0.07	0.000	0.041	0.2066	0.8920	0.0001	7.77E-07
187	0.02	0.000	0.034	0.2049	0.8917	0.0001	7.77E-07
188	0.00	0.000	0.030	0.2019	0.8914	0.0001	7.77E-07
189	0.06	0.000	0.028	0.2051	0.8911	0.0001	7.77E-07
190	0.08	0.000	0.024	0.2111	0.8908	0.0001	7.76E-07
191	0.01	0.000	0.018	0.2102	0.8904	0.0001	7.76E-07
192	0.00	0.000	0.017	0.2085	0.8901	0.0001	7.76E-07
193	0.00	0.000	0.018	0.2068	0.8898	0.0001	7.76E-07
194	0.00	0.000	0.018	0.2049	0.8895	0.0001	7.75E-07
195	0.00	0.000	0.016	0.2034	0.8892	0.0001	7.75E-07
196	0.00	0.000	0.017	0.2018	0.8889	0.0001	7.75E-07
197	0.11	0.000	0.020	0.2105	0.8886	0.0001	7.75E-07
198	0.24	0.043	0.027	0.2232	0.8883	0.0001	7.74E-07
199	0.24	0.028	0.207	0.2257	0.8880	0.0001	7.74E-07
200	0.00	0.000	0.105	0.2183	0.8876	0.0001	7.74E-07
201	0.00	0.000	0.100	0.2082	0.8873	0.0001	7.74E-07
202	0.17	0.011	0.057	0.2170	0.8870	0.0001	7.73E-07
203	0.00	0.000	0.052	0.2129	0.8867	0.0001	7.73E-07
204	0.00	0.000	0.037	0.2092	0.8864	0.0001	7.73E-07
205	1.82	0.933	0.044	0.2234	0.8861	0.0001	7.73E-07
206	0.09	0.166	0.337	0.2351	0.8858	0.0001	7.72E-07
207	0.02	0.000	0.149	0.2388	0.8855	0.0001	7.72E-07
208	0.00	0.000	0.093	0.2295	0.8852	0.0001	7.72E-07
209	0.00	0.000	0.128	0.2167	0.8848	0.0001	7.72E-07
210	0.00	0.000	0.166	0.2001	0.8845	0.0001	7.71E-07
211	0.00	0.000	0.027	0.1975	0.8842	0.0001	7.71E-07
212	0.52	0.106	0.150	0.2134	0.8839	0.0001	7.71E-07
213	0.33	0.025	0.372	0.2142	0.8852	0.0001	7.72E-07
214	0.00	0.000	0.135	0.2033	0.8859	0.0001	7.72E-07
215	0.00	0.000	0.046	0.1987	0.8855	0.0001	7.72E-07
216	0.00	0.000	0.016	0.1971	0.8852	0.0001	7.72E-07

217	0.00	0.000	0.001	0.1970	0.8849	0.0001	7.72E-07
218	0.00	0.000	0.000	0.1970	0.8846	0.0001	7.71E-07
219	0.31	0.068	0.042	0.2106	0.8843	0.0001	7.71E-07
220	0.00	0.000	0.085	0.2089	0.8840	0.0001	7.71E-07
221	0.00	0.000	0.026	0.2064	0.8837	0.0001	7.71E-07
222	0.00	0.000	0.024	0.2040	0.8834	0.0001	7.70E-07
223	0.00	0.000	0.023	0.2017	0.8831	0.0001	7.70E-07
224	0.00	0.000	0.022	0.1995	0.8828	0.0001	7.70E-07
225	0.00	0.000	0.018	0.1977	0.8825	0.0001	7.70E-07
226	0.00	0.000	0.007	0.1970	0.8821	0.0001	7.69E-07
227	0.00	0.000	0.000	0.1970	0.8818	0.0001	7.69E-07
228	0.00	0.000	0.000	0.1970	0.8815	0.0001	7.69E-07
229	0.13	0.000	0.008	0.2090	0.8812	0.0001	7.69E-07
230	0.00	0.000	0.010	0.2080	0.8809	0.0001	7.68E-07
231	0.00	0.000	0.011	0.2069	0.8806	0.0001	7.68E-07
232	0.00	0.000	0.014	0.2055	0.8803	0.0001	7.68E-07
233	0.00	0.000	0.015	0.2040	0.8800	0.0001	7.68E-07
234	0.00	0.000	0.017	0.2023	0.8797	0.0001	7.67E-07
235	0.00	0.000	0.019	0.2004	0.8794	0.0001	7.67E-07
236	0.00	0.000	0.017	0.1986	0.8791	0.0001	7.67E-07
237	0.00	0.000	0.013	0.1974	0.8788	0.0001	7.67E-07
238	0.00	0.000	0.004	0.1970	0.8784	0.0001	7.66E-07
239	0.00	0.000	0.000	0.1970	0.8781	0.0001	7.66E-07
240	0.00	0.000	0.000	0.1970	0.8778	0.0001	7.66E-07
241	0.00	0.000	0.000	0.1970	0.8775	0.0001	7.66E-07
242	0.00	0.000	0.000	0.1970	0.8772	0.0001	7.66E-07
243	0.00	0.000	0.000	0.1970	0.8769	0.0001	7.65E-07
244	0.03	0.000	0.007	0.1991	0.8766	0.0001	7.65E-07
245	0.23	0.038	0.021	0.2128	0.8763	0.0001	7.65E-07
246	0.52	0.193	0.058	0.2242	0.8760	0.0001	7.65E-07
247	0.73	0.310	0.230	0.2359	0.8757	0.0001	7.64E-07
248	0.00	0.000	0.298	0.2325	0.8754	0.0001	7.64E-07

249	0.00	0.000	0.150	0.2175	0.8751	0.0001	7.64E-07
250	0.00	0.000	0.173	0.2003	0.8748	0.0001	7.64E-07
251	0.01	0.000	0.029	0.1984	0.8745	0.0001	7.63E-07
252	1.69	0.771	0.186	0.2144	0.8741	0.0001	7.63E-07
253	0.09	0.195	0.154	0.2261	0.8738	0.0001	7.63E-07
254	0.84	0.338	0.315	0.2377	0.8735	0.0001	7.63E-07
255	0.10	0.000	0.258	0.2484	0.8732	0.0001	7.62E-07
256	0.00	0.000	0.141	0.2343	0.8729	0.0001	7.62E-07
257	0.00	0.000	0.122	0.2221	0.8726	0.0001	7.62E-07
258	0.04	0.000	0.110	0.2156	0.8723	0.0001	7.62E-07
259	0.00	0.000	0.091	0.2065	0.8720	0.0001	7.61E-07
260	0.00	0.000	0.083	0.1982	0.8717	0.0001	7.61E-07
261	0.00	0.000	0.012	0.1974	0.8714	0.0001	7.61E-07
262	0.06	0.000	0.015	0.2016	0.8711	0.0001	7.61E-07
263	0.05	0.000	0.023	0.2043	0.8708	0.0001	7.60E-07
264	0.00	0.000	0.020	0.2024	0.8705	0.0001	7.60E-07
265	0.00	0.000	0.023	0.2001	0.8702	0.0001	7.60E-07
266	0.36	0.086	0.037	0.2150	0.8699	0.0001	7.60E-07
267	0.01	0.000	0.105	0.2137	0.8696	0.0001	7.59E-07
268	0.00	0.000	0.119	0.2018	0.8693	0.0001	7.59E-07
269	0.00	0.000	0.038	0.1980	0.8690	0.0001	7.59E-07
270	0.00	0.000	0.010	0.1970	0.8687	0.0001	7.59E-07
271	0.00	0.000	0.000	0.1970	0.8683	0.0001	7.58E-07
272	0.18	0.019	0.022	0.2091	0.8680	0.0001	7.58E-07
273	0.02	0.000	0.039	0.2086	0.8677	0.0001	7.58E-07
274	0.00	0.000	0.020	0.2066	0.8674	0.0001	7.58E-07
275	0.00	0.000	0.019	0.2047	0.8671	0.0001	7.57E-07
276	1.32	0.625	0.032	0.2196	0.8668	0.0001	7.57E-07
277	0.00	0.164	0.073	0.2313	0.8665	0.0001	7.57E-07
278	0.00	0.000	0.076	0.2400	0.8662	0.0001	7.57E-07
279	0.00	0.000	0.124	0.2277	0.8659	0.0001	7.56E-07
280	0.00	0.000	0.080	0.2197	0.8656	0.0001	7.56E-07

281		0.24	0.043	0.118	0.2232	0.8653	0.0001	7.56E-07
282		0.00	0.000	0.194	0.2082	0.8651	0.0001	7.56E-07
283		0.00	0.000	0.089	0.1992	0.8647	0.0001	7.56E-07
284		0.00	0.000	0.022	0.1971	0.8644	0.0001	7.55E-07
285		0.00	0.000	0.001	0.1970	0.8641	0.0001	7.55E-07
286		0.00	0.000	0.000	0.1970	0.8638	0.0001	7.55E-07
287		0.00	0.000	0.000	0.1970	0.8635	0.0001	7.55E-07
288		0.00	0.000	0.000	0.1970	0.8632	0.0001	7.54E-07
289		0.00	0.000	0.000	0.1970	0.8629	0.0001	7.54E-07
290		0.00	0.000	0.000	0.1970	0.8626	0.0001	7.54E-07
291		0.00	0.000	0.000	0.1970	0.8623	0.0001	7.54E-07
292		0.00	0.000	0.000	0.1970	0.8620	0.0001	7.53E-07
293		0.38	0.095	0.032	0.2126	0.8617	0.0001	7.53E-07
294		0.00	0.000	0.105	0.2116	0.8614	0.0001	7.53E-07
295		0.00	0.000	0.015	0.2101	0.8611	0.0001	7.53E-07
296		0.00	0.000	0.015	0.2086	0.8608	0.0001	7.52E-07
297		0.00	0.000	0.014	0.2072	0.8605	0.0001	7.52E-07
298		0.12	0.000	0.020	0.2172	0.8602	0.0001	7.52E-07
299		0.16	0.012	0.022	0.2281	0.8599	0.0001	7.52E-07
300		0.20	0.038	0.035	0.2384	0.8596	0.0001	7.51E-07
301		0.22	0.033	0.158	0.2423	0.8593	0.0001	7.51E-07
302		0.25	0.036	0.108	0.2530	0.8590	0.0001	7.51E-07
303		1.56	0.893	0.107	0.2647	0.8587	0.0001	7.51E-07
304		0.97	0.698	0.132	0.2763	0.8584	0.0001	7.50E-07
305		0.07	0.159	0.144	0.2879	0.8581	0.0001	7.50E-07
306		0.00	0.000	0.220	0.2818	0.8578	0.0001	7.50E-07
307		0.00	0.000	0.081	0.2737	0.8575	0.0001	7.50E-07
308		0.14	0.004	0.077	0.2795	0.8572	0.0001	7.50E-07
309	*	0.68	0.000	0.030	0.2814	0.8569	0.0001	7.49E-07
310	*	0.07	0.000	0.018	0.2834	0.8566	0.0001	7.49E-07
311	*	0.00	0.000	0.012	0.2854	0.8563	0.0001	7.49E-07
312	*	0.00	0.000	0.030	0.2874	0.8560	0.0001	7.49E-07

313		0.00	0.250	0.000	0.3002	0.8557	0.0001	7.48E-07
314		0.00	0.000	0.117	0.3092	0.8554	0.0001	7.48E-07
315		0.00	0.000	0.120	0.2972	0.8551	0.0001	7.48E-07
316		0.00	0.000	0.077	0.2896	0.8548	0.0001	7.48E-07
317		0.00	0.000	0.114	0.2782	0.8545	0.0001	7.47E-07
318		0.00	0.000	0.140	0.2642	0.8542	0.0001	7.47E-07
319		0.00	0.000	0.154	0.2489	0.8539	0.0001	7.47E-07
320		0.12	0.000	0.246	0.2360	0.8536	0.0001	7.47E-07
321		0.03	0.000	0.144	0.2249	0.8533	0.0001	7.46E-07
322		0.01	0.000	0.057	0.2206	0.8530	0.0001	7.46E-07
323		0.61	0.214	0.050	0.2339	0.8527	0.0001	7.46E-07
324		0.00	0.000	0.104	0.2451	0.8524	0.0001	7.46E-07
325		0.00	0.000	0.123	0.2328	0.8521	0.0001	7.45E-07
326		0.00	0.000	0.073	0.2255	0.8518	0.0001	7.45E-07
327		0.00	0.000	0.059	0.2195	0.8515	0.0001	7.45E-07
328		0.00	0.000	0.075	0.2120	0.8512	0.0001	7.45E-07
329		0.00	0.000	0.070	0.2040	0.8699	0.0001	7.60E-07
330		0.00	0.000	0.069	0.1971	0.8810	0.0001	7.69E-07
331		0.00	0.000	0.001	0.1971	0.8807	0.0001	7.68E-07
332		0.00	0.000	0.001	0.1970	0.8804	0.0001	7.68E-07
333	*	0.00	0.000	0.000	0.1970	0.8801	0.0001	7.68E-07
334		0.00	0.000	0.000	0.1970	0.8798	0.0001	7.68E-07
335		0.00	0.000	0.000	0.1970	0.8794	0.0001	7.67E-07
336		0.00	0.000	0.000	0.1970	0.8791	0.0001	7.67E-07
337		0.00	0.000	0.000	0.1970	0.8788	0.0001	7.67E-07
338		0.00	0.000	0.000	0.1970	0.8785	0.0001	7.67E-07
339		0.00	0.000	0.000	0.1970	0.8782	0.0001	7.66E-07
340		0.00	0.000	0.000	0.1970	0.8779	0.0001	7.66E-07
341		0.00	0.000	0.000	0.1970	0.8776	0.0001	7.66E-07
342		0.00	0.000	0.000	0.1970	0.8773	0.0001	7.66E-07
343		0.00	0.000	0.000	0.1970	0.8770	0.0001	7.65E-07
344		0.07	0.000	0.007	0.2032	0.8767	0.0001	7.65E-07

345		0.00	0.000	0.008	0.2024	0.8764	0.0001	7.65E-07
346		0.00	0.000	0.009	0.2015	0.8761	0.0001	7.65E-07
347		0.15	0.009	0.015	0.2131	0.8758	0.0001	7.64E-07
348		0.00	0.000	0.017	0.2123	0.8754	0.0001	7.64E-07
349		0.01	0.000	0.015	0.2115	0.8751	0.0001	7.64E-07
350		0.00	0.000	0.011	0.2104	0.8748	0.0001	7.64E-07
351		0.00	0.000	0.010	0.2094	0.8745	0.0001	7.63E-07
352		0.38	0.107	0.021	0.2238	0.8742	0.0001	7.63E-07
353		0.00	0.000	0.117	0.2228	0.8739	0.0001	7.63E-07
354		0.02	0.000	0.015	0.2229	0.8736	0.0001	7.63E-07
355		0.18	0.024	0.015	0.2350	0.8733	0.0001	7.62E-07
356		0.00	0.000	0.051	0.2323	0.8730	0.0001	7.62E-07
357	*	0.00	0.000	0.009	0.2314	0.8727	0.0001	7.62E-07
358	*	0.00	0.000	0.009	0.2305	0.8724	0.0001	7.62E-07
359	*	0.00	0.000	0.000	0.2305	0.8721	0.0001	7.61E-07
360	*	0.48	0.000	0.016	0.2324	0.8718	0.0001	7.61E-07
361		0.34	0.349	0.000	0.2452	0.8715	0.0001	7.61E-07
362		0.15	0.142	0.061	0.2568	0.8712	0.0001	7.61E-07
363		0.03	0.000	0.129	0.2611	0.8709	0.0001	7.60E-07
364		1.29	0.688	0.056	0.2739	0.8706	0.0001	7.60E-07
365		0.00	0.089	0.121	0.2855	0.8702	0.0001	7.60E-07

* = Frozen (air or soil)

Annual Totals for Year 5			
	inches	cubic feet	percent
Precipitation	37.67	136,729.3	100.00
Runoff	14.595	52,979.3	38.75
Evapotranspiration	22.359	81,162.5	59.36
Recirculation into Layer 1	0.0368	133.6	0.10
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0368	133.6	0.10
Percolation/Leakage through Layer 5	0.000283	1.0273	0.00
Average Head on Top of Layer 4	0.8896	---	---
Change in Water Storage	0.7125	2,586.4	1.89
Soil Water at Start of Year	293.4865	1,065,356.1	779.17
Soil Water at End of Year	294.1105	1,067,621.2	780.83
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0885	321.3	0.23
Annual Water Budget Balance	-0.0368	-133.6	-0.10

Daily Output for Year 6

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.136	0.2807	0.8699	0.0001	7.60E-07
2			0.00	0.000	0.082	0.2726	0.8696	0.0001	7.59E-07
3			0.17	0.013	0.097	0.2771	0.8693	0.0001	7.59E-07
4			0.24	0.036	0.084	0.2873	0.8690	0.0001	7.59E-07
5			0.59	0.248	0.083	0.2989	0.8687	0.0001	7.59E-07
6	*		0.10	0.015	0.026	0.3106	0.8684	0.0001	7.58E-07
7	*		0.02	0.000	0.040	0.3128	0.8681	0.0001	7.58E-07
8			0.00	0.000	0.079	0.3124	0.8678	0.0001	7.58E-07
9			0.00	0.000	0.092	0.3032	0.8675	0.0001	7.58E-07
10			0.24	0.035	0.076	0.3128	0.8672	0.0001	7.58E-07
11	*		0.34	0.000	0.030	0.3150	0.8669	0.0001	7.57E-07
12	*		0.23	0.000	0.037	0.3171	0.8666	0.0001	7.57E-07
13	*		0.01	0.000	0.000	0.3192	0.8663	0.0001	7.57E-07
14			0.07	0.222	0.013	0.3319	0.8660	0.0001	7.57E-07
15	*		0.01	0.007	0.061	0.3435	0.8657	0.0001	7.56E-07
16			0.00	0.000	0.074	0.3368	0.8654	0.0001	7.56E-07
17			0.00	0.000	0.053	0.3315	0.8651	0.0001	7.56E-07
18			0.00	0.000	0.090	0.3226	0.8648	0.0001	7.56E-07
19			0.10	0.000	0.093	0.3238	0.8645	0.0001	7.55E-07
20			0.00	0.000	0.091	0.3139	0.8700	0.0001	7.60E-07
21			0.00	0.000	0.061	0.3072	0.8963	0.0001	7.81E-07
22			0.00	0.000	0.094	0.2973	0.9060	0.0001	7.89E-07
23			0.00	0.000	0.076	0.2897	0.9203	0.0001	8.00E-07
24			0.25	0.048	0.112	0.2940	0.9200	0.0001	8.00E-07

25		0.05	0.000	0.114	0.2924	0.9197	0.0001	7.99E-07
26		0.05	0.000	0.107	0.2867	0.9193	0.0001	7.99E-07
27		0.62	0.214	0.063	0.2996	0.9190	0.0001	7.99E-07
28		0.41	0.203	0.100	0.3112	0.9187	0.0001	7.99E-07
29		0.00	0.005	0.075	0.3229	0.9184	0.0001	7.98E-07
30		0.00	0.000	0.093	0.3136	0.9305	0.0001	8.08E-07
31		0.00	0.000	0.070	0.3066	0.9343	0.0001	8.11E-07
32		0.00	0.000	0.089	0.2977	0.9339	0.0001	8.11E-07
33		0.50	0.130	0.095	0.3127	0.9336	0.0001	8.10E-07
34		0.24	0.063	0.125	0.3226	0.9526	0.0001	8.26E-07
35		0.74	0.329	0.122	0.3339	0.9931	0.0001	8.58E-07
36		0.00	0.000	0.137	0.3435	0.9958	0.0001	8.60E-07
37		0.00	0.000	0.077	0.3351	0.9955	0.0001	8.60E-07
38		0.92	0.413	0.084	0.3488	1.0127	0.0001	8.73E-07
39		0.06	0.074	0.086	0.3604	1.0124	0.0001	8.73E-07
40		0.06	0.000	0.123	0.3605	1.0243	0.0001	8.82E-07
41		0.05	0.000	0.067	0.3579	1.0473	0.0001	9.00E-07
42		0.00	0.000	0.061	0.3471	1.1051	0.0001	9.46E-07
43		0.10	0.000	0.105	0.3412	1.2327	0.0001	1.05E-06
44		0.00	0.000	0.219	0.3151	1.3684	0.0002	1.15E-06
45		0.00	0.000	0.193	0.2929	1.4957	0.0002	1.25E-06
46		0.00	0.000	0.085	0.2844	1.5977	0.0002	1.33E-06
47		0.00	0.000	0.124	0.2721	1.5972	0.0002	1.33E-06
48		0.00	0.000	0.134	0.2587	1.5966	0.0002	1.33E-06
49		0.00	0.000	0.112	0.2475	1.5961	0.0002	1.33E-06
50	*	0.19	0.000	0.045	0.2495	1.5955	0.0002	1.33E-06
51		0.35	0.126	0.077	0.2638	1.5949	0.0002	1.32E-06
52		0.02	0.000	0.148	0.2636	1.5944	0.0002	1.32E-06
53	*	0.00	0.000	0.081	0.2556	1.5938	0.0002	1.32E-06
54	*	0.23	0.000	0.039	0.2575	1.5933	0.0002	1.32E-06
55		0.00	0.000	0.137	0.2609	1.5927	0.0002	1.32E-06
56	*	0.02	0.000	0.055	0.2569	1.5922	0.0002	1.32E-06

57	*	0.00	0.000	0.079	0.2490	1.5916	0.0002	1.32E-06
58		0.00	0.000	0.090	0.2400	1.5910	0.0002	1.32E-06
59		0.00	0.000	0.119	0.2281	1.5905	0.0002	1.32E-06
60	*	0.05	0.000	0.052	0.2282	1.5899	0.0002	1.32E-06
61		0.00	0.000	0.053	0.2204	1.6337	0.0002	1.35E-06
62		0.05	0.000	0.048	0.2210	1.6630	0.0002	1.38E-06
63		0.00	0.000	0.038	0.2172	1.6624	0.0002	1.38E-06
64		0.04	0.000	0.036	0.2161	1.6865	0.0002	1.39E-06
65		1.01	0.449	0.033	0.2290	1.7105	0.0002	1.41E-06
66		0.00	0.035	0.212	0.2406	1.7099	0.0002	1.41E-06
67		0.00	0.000	0.275	0.2139	1.7093	0.0002	1.41E-06
68		0.00	0.000	0.084	0.2055	1.7494	0.0002	1.44E-06
69		0.00	0.000	0.065	0.1990	1.7929	0.0002	1.48E-06
70		0.00	0.000	0.019	0.1971	1.7922	0.0002	1.47E-06
71		0.00	0.000	0.001	0.1971	1.7916	0.0002	1.47E-06
72		0.00	0.000	0.001	0.1970	1.7910	0.0002	1.47E-06
73		0.00	0.000	0.000	0.1970	1.7903	0.0002	1.47E-06
74		0.00	0.000	0.000	0.1970	1.7897	0.0002	1.47E-06
75	*	0.09	0.000	0.049	0.1990	1.7891	0.0002	1.47E-06
76	*	0.07	0.000	0.050	0.2010	1.7885	0.0002	1.47E-06
77	*	0.10	0.000	0.059	0.2030	1.7878	0.0002	1.47E-06
78	*	0.50	0.000	0.000	0.2050	1.7872	0.0002	1.47E-06
79		0.31	0.321	0.085	0.2177	1.7866	0.0002	1.47E-06
80		0.82	0.435	0.169	0.2294	1.7860	0.0002	1.47E-06
81		0.10	0.083	0.207	0.2410	1.7853	0.0002	1.47E-06
82		0.00	0.000	0.248	0.2246	1.7847	0.0002	1.47E-06
83		0.00	0.000	0.107	0.2139	1.7841	0.0002	1.47E-06
84		0.27	0.047	0.111	0.2201	1.7835	0.0002	1.47E-06
85	*	0.18	0.000	0.047	0.2226	1.7828	0.0002	1.47E-06
86		0.10	0.000	0.181	0.2295	1.7822	0.0002	1.47E-06
87		0.00	0.000	0.112	0.2183	1.7816	0.0002	1.47E-06
88		0.00	0.000	0.062	0.2121	1.7810	0.0002	1.47E-06

89	*	0.00	0.000	0.000	0.2121	1.7803	0.0002	1.47E-06
90	*	0.00	0.000	0.002	0.2121	1.7797	0.0002	1.47E-06
91	*	0.00	0.000	0.039	0.2082	1.7795	0.0002	1.46E-06
92	*	0.85	0.000	0.026	0.2102	1.7800	0.0002	1.47E-06
93		0.08	0.372	0.035	0.2237	1.7794	0.0002	1.46E-06
94		0.18	0.120	0.169	0.2354	1.7788	0.0002	1.46E-06
95	*	0.00	0.000	0.065	0.2354	1.7782	0.0002	1.46E-06
96	*	0.00	0.000	0.053	0.2354	1.7775	0.0002	1.46E-06
97		0.00	0.000	0.000	0.2354	1.7769	0.0002	1.46E-06
98		0.21	0.041	0.000	0.2487	1.7763	0.0002	1.46E-06
99		0.33	0.112	0.000	0.2603	1.7757	0.0002	1.46E-06
100		0.00	0.000	0.000	0.2603	1.7750	0.0002	1.46E-06
101		0.00	0.000	0.000	0.2603	1.7744	0.0002	1.46E-06
102		0.02	0.000	0.000	0.2622	1.7738	0.0002	1.46E-06
103		0.00	0.000	0.000	0.2623	1.7732	0.0002	1.46E-06
104	*	0.00	0.000	0.112	0.2623	1.7726	0.0002	1.46E-06
105	*	0.00	0.000	0.036	0.2623	1.7719	0.0002	1.46E-06
106		0.04	0.000	0.132	0.2534	1.7713	0.0002	1.46E-06
107		0.00	0.000	0.146	0.2388	1.7707	0.0002	1.46E-06
108		0.00	0.000	0.247	0.2141	1.7703	0.0002	1.46E-06
109		0.00	0.000	0.143	0.1998	1.7699	0.0002	1.46E-06
110		0.00	0.000	0.016	0.1982	1.7693	0.0002	1.46E-06
111		0.21	0.036	0.040	0.2084	1.7687	0.0002	1.46E-06
112		0.00	0.000	0.055	0.2066	1.7681	0.0002	1.46E-06
113		0.00	0.000	0.025	0.2041	1.7675	0.0002	1.46E-06
114		0.02	0.000	0.026	0.2032	1.7668	0.0002	1.46E-06
115		0.00	0.000	0.021	0.2012	1.7662	0.0002	1.45E-06
116		0.00	0.000	0.019	0.1992	1.7656	0.0002	1.45E-06
117		0.22	0.041	0.022	0.2111	1.7650	0.0002	1.45E-06
118		0.00	0.000	0.055	0.2098	1.7644	0.0002	1.45E-06
119		0.00	0.000	0.016	0.2082	1.7638	0.0002	1.45E-06
120		0.23	0.041	0.022	0.2210	1.7631	0.0002	1.45E-06

121	0.05	0.000	0.057	0.2246	1.7625	0.0002	1.45E-06
122	0.42	0.135	0.024	0.2374	1.7619	0.0002	1.45E-06
123	0.36	0.058	0.268	0.2490	1.7613	0.0002	1.45E-06
124	0.00	0.000	0.279	0.2266	1.7607	0.0002	1.45E-06
125	0.00	0.000	0.272	0.1994	1.7601	0.0002	1.45E-06
126	0.00	0.000	0.012	0.1982	1.7595	0.0002	1.45E-06
127	0.00	0.000	0.008	0.1976	1.7589	0.0002	1.45E-06
128	0.00	0.000	0.006	0.1970	1.7583	0.0002	1.45E-06
129	0.00	0.000	0.000	0.1970	1.7577	0.0002	1.45E-06
130	0.00	0.000	0.000	0.1970	1.7570	0.0002	1.45E-06
131	0.21	0.034	0.017	0.2094	1.7564	0.0002	1.45E-06
132	0.21	0.037	0.065	0.2200	1.7558	0.0002	1.45E-06
133	0.00	0.000	0.049	0.2189	1.7552	0.0002	1.45E-06
134	0.05	0.000	0.021	0.2221	1.7546	0.0002	1.45E-06
135	0.01	0.000	0.024	0.2210	1.7540	0.0002	1.45E-06
136	0.20	0.030	0.019	0.2327	1.7534	0.0002	1.45E-06
137	0.43	0.059	0.233	0.2444	1.7527	0.0002	1.44E-06
138	1.92	1.008	0.342	0.2560	1.7521	0.0002	1.44E-06
139	0.00	0.109	0.175	0.2677	1.7515	0.0002	1.44E-06
140	0.00	0.000	0.142	0.2644	1.7509	0.0002	1.44E-06
141	0.43	0.074	0.169	0.2776	1.7503	0.0002	1.44E-06
142	0.08	0.000	0.104	0.2807	1.7497	0.0002	1.44E-06
143	0.04	0.000	0.097	0.2748	1.7491	0.0002	1.44E-06
144	0.22	0.031	0.182	0.2726	1.7484	0.0002	1.44E-06
145	0.00	0.000	0.273	0.2487	1.7478	0.0002	1.44E-06
146	0.16	0.002	0.224	0.2421	1.7472	0.0002	1.44E-06
147	1.23	0.447	0.332	0.2534	1.7466	0.0002	1.44E-06
148	0.07	0.000	0.412	0.2529	1.7460	0.0002	1.44E-06
149	1.27	0.564	0.186	0.2658	1.7454	0.0002	1.44E-06
150	0.64	0.328	0.317	0.2775	1.7448	0.0002	1.44E-06
151	0.10	0.000	0.386	0.2757	1.7442	0.0002	1.44E-06
152	0.86	0.218	0.434	0.2885	1.7436	0.0002	1.44E-06

153	0.34	0.067	0.196	0.3002	1.7429	0.0002	1.44E-06
154	0.00	0.000	0.263	0.2777	1.7423	0.0002	1.44E-06
155	0.00	0.000	0.141	0.2636	1.7417	0.0002	1.44E-06
156	0.55	0.075	0.270	0.2772	1.7411	0.0002	1.44E-06
157	0.07	0.000	0.363	0.2550	1.7405	0.0002	1.44E-06
158	2.04	0.916	0.433	0.2671	1.7399	0.0002	1.43E-06
159	0.00	0.000	0.513	0.2731	1.7393	0.0002	1.43E-06
160	0.00	0.000	0.413	0.2318	1.7392	0.0002	1.43E-06
161	0.31	0.038	0.358	0.2198	1.7401	0.0002	1.44E-06
162	0.30	0.024	0.385	0.2103	1.7395	0.0002	1.43E-06
163	0.16	0.004	0.217	0.2058	1.7389	0.0002	1.43E-06
164	0.01	0.000	0.061	0.2012	1.7383	0.0002	1.43E-06
165	0.00	0.000	0.029	0.1983	1.7377	0.0002	1.43E-06
166	0.00	0.000	0.011	0.1972	1.7371	0.0002	1.43E-06
167	0.00	0.000	0.001	0.1971	1.7365	0.0002	1.43E-06
168	0.01	0.000	0.006	0.1970	1.7359	0.0002	1.43E-06
169	0.00	0.000	0.000	0.1970	1.7352	0.0002	1.43E-06
170	0.00	0.000	0.000	0.1970	1.7346	0.0002	1.43E-06
171	0.00	0.000	0.000	0.1970	1.7340	0.0002	1.43E-06
172	0.00	0.000	0.000	0.1970	1.7334	0.0002	1.43E-06
173	1.40	0.667	0.029	0.2132	1.7328	0.0002	1.43E-06
174	0.00	0.128	0.170	0.2249	1.7322	0.0002	1.43E-06
175	0.46	0.033	0.432	0.2345	1.7316	0.0002	1.43E-06
176	0.12	0.000	0.128	0.2363	1.7310	0.0002	1.43E-06
177	0.51	0.119	0.158	0.2490	1.7304	0.0002	1.43E-06
178	0.11	0.000	0.161	0.2541	1.7298	0.0002	1.43E-06
179	0.00	0.000	0.280	0.2261	1.7292	0.0002	1.43E-06
180	2.62	1.338	0.312	0.2416	1.7286	0.0002	1.43E-06
181	0.04	0.290	0.156	0.2532	1.7280	0.0002	1.43E-06
182	0.00	0.000	0.238	0.2589	1.7274	0.0002	1.43E-06
183	0.00	0.000	0.226	0.2363	1.7268	0.0002	1.43E-06
184	0.00	0.000	0.282	0.2081	1.7262	0.0002	1.42E-06

185	0.30	0.047	0.157	0.2132	1.7256	0.0002	1.42E-06
186	0.00	0.000	0.151	0.2028	1.7249	0.0002	1.42E-06
187	0.00	0.000	0.040	0.1988	1.7243	0.0002	1.42E-06
188	0.12	0.000	0.032	0.2080	1.7237	0.0002	1.42E-06
189	0.00	0.000	0.026	0.2054	1.7231	0.0002	1.42E-06
190	1.00	0.424	0.052	0.2195	1.7225	0.0002	1.42E-06
191	0.00	0.014	0.235	0.2311	1.7219	0.0002	1.42E-06
192	0.00	0.000	0.254	0.2071	1.7213	0.0002	1.42E-06
193	0.00	0.000	0.086	0.1986	1.7207	0.0002	1.42E-06
194	0.00	0.000	0.011	0.1978	1.7201	0.0002	1.42E-06
195	0.00	0.000	0.004	0.1974	1.7195	0.0002	1.42E-06
196	0.00	0.000	0.004	0.1970	1.7189	0.0002	1.42E-06
197	0.00	0.000	0.000	0.1970	1.7183	0.0002	1.42E-06
198	0.07	0.000	0.008	0.2029	1.7177	0.0002	1.42E-06
199	0.00	0.000	0.018	0.2012	1.7171	0.0002	1.42E-06
200	0.00	0.000	0.023	0.1989	1.7165	0.0002	1.42E-06
201	0.00	0.000	0.009	0.1980	1.7159	0.0002	1.42E-06
202	0.00	0.000	0.007	0.1973	1.7153	0.0002	1.42E-06
203	0.00	0.000	0.002	0.1971	1.7147	0.0002	1.42E-06
204	0.00	0.000	0.001	0.1970	1.7141	0.0002	1.42E-06
205	1.53	0.749	0.029	0.2131	1.7135	0.0002	1.41E-06
206	0.22	0.264	0.166	0.2247	1.7129	0.0002	1.41E-06
207	0.43	0.217	0.148	0.2364	1.7123	0.0002	1.41E-06
208	1.61	0.932	0.168	0.2480	1.7117	0.0002	1.41E-06
209	0.13	0.238	0.150	0.2596	1.7111	0.0002	1.41E-06
210	0.08	0.028	0.149	0.2713	1.7105	0.0002	1.41E-06
211	0.00	0.000	0.152	0.2589	1.7099	0.0002	1.41E-06
212	0.00	0.000	0.157	0.2433	1.7093	0.0002	1.41E-06
213	0.00	0.000	0.227	0.2205	1.7087	0.0002	1.41E-06
214	0.18	0.013	0.136	0.2220	1.7081	0.0002	1.41E-06
215	0.03	0.000	0.224	0.2045	1.7075	0.0002	1.41E-06
216	0.00	0.000	0.046	0.1999	1.7069	0.0002	1.41E-06

217	0.00	0.000	0.024	0.1976	1.7063	0.0002	1.41E-06
218	0.00	0.000	0.004	0.1972	1.7057	0.0002	1.41E-06
219	0.00	0.000	0.002	0.1970	1.7051	0.0002	1.41E-06
220	0.00	0.000	0.000	0.1970	1.7045	0.0002	1.41E-06
221	0.00	0.000	0.000	0.1970	1.7039	0.0002	1.41E-06
222	0.00	0.000	0.000	0.1970	1.7033	0.0002	1.41E-06
223	0.00	0.000	0.000	0.1970	1.7027	0.0002	1.41E-06
224	0.00	0.000	0.000	0.1970	1.7021	0.0002	1.41E-06
225	0.20	0.027	0.018	0.2093	1.7015	0.0002	1.41E-06
226	0.92	0.408	0.056	0.2208	1.7009	0.0002	1.41E-06
227	0.00	0.000	0.255	0.2319	1.7003	0.0002	1.40E-06
228	0.68	0.175	0.252	0.2435	1.6998	0.0002	1.40E-06
229	0.00	0.000	0.245	0.2327	1.6992	0.0002	1.40E-06
230	0.00	0.000	0.195	0.2132	1.6986	0.0002	1.40E-06
231	0.00	0.000	0.138	0.1995	1.6980	0.0002	1.40E-06
232	0.00	0.000	0.013	0.1982	1.6974	0.0002	1.40E-06
233	0.00	0.000	0.006	0.1976	1.6968	0.0002	1.40E-06
234	0.00	0.000	0.006	0.1970	1.6962	0.0002	1.40E-06
235	0.00	0.000	0.000	0.1970	1.6956	0.0002	1.40E-06
236	0.84	0.327	0.048	0.2129	1.6950	0.0002	1.40E-06
237	0.00	0.000	0.301	0.2133	1.6944	0.0002	1.40E-06
238	0.14	0.003	0.061	0.2210	1.6938	0.0002	1.40E-06
239	0.00	0.000	0.102	0.2111	1.6932	0.0002	1.40E-06
240	0.79	0.229	0.212	0.2252	1.6926	0.0002	1.40E-06
241	0.00	0.000	0.156	0.2308	1.6920	0.0002	1.40E-06
242	0.28	0.033	0.128	0.2398	1.6914	0.0002	1.40E-06
243	0.00	0.000	0.166	0.2266	1.6908	0.0002	1.40E-06
244	0.00	0.000	0.166	0.2101	1.6903	0.0002	1.40E-06
245	0.00	0.000	0.116	0.1985	1.6897	0.0002	1.40E-06
246	0.00	0.000	0.008	0.1976	1.6891	0.0002	1.40E-06
247	0.00	0.000	0.004	0.1973	1.6885	0.0002	1.40E-06
248	0.27	0.050	0.064	0.2081	1.6879	0.0002	1.40E-06

249	0.00	0.000	0.075	0.2057	1.6873	0.0002	1.40E-06
250	0.18	0.023	0.033	0.2160	1.6867	0.0002	1.39E-06
251	0.79	0.163	0.405	0.2275	1.6861	0.0002	1.39E-06
252	0.00	0.000	0.237	0.2172	1.6855	0.0002	1.39E-06
253	0.23	0.026	0.266	0.2078	1.6849	0.0002	1.39E-06
254	0.36	0.025	0.360	0.2059	1.6843	0.0002	1.39E-06
255	0.06	0.000	0.078	0.2066	1.6838	0.0002	1.39E-06
256	0.01	0.000	0.071	0.2006	1.6832	0.0002	1.39E-06
257	0.00	0.000	0.026	0.1981	1.6826	0.0002	1.39E-06
258	0.00	0.000	0.009	0.1972	1.6820	0.0002	1.39E-06
259	0.00	0.000	0.001	0.1971	1.6814	0.0002	1.39E-06
260	0.13	0.000	0.010	0.2087	1.6808	0.0002	1.39E-06
261	0.00	0.000	0.016	0.2072	1.6802	0.0002	1.39E-06
262	0.00	0.000	0.021	0.2051	1.6796	0.0002	1.39E-06
263	0.00	0.000	0.022	0.2029	1.6791	0.0002	1.39E-06
264	0.00	0.000	0.023	0.2007	1.6785	0.0002	1.39E-06
265	0.00	0.000	0.022	0.1985	1.6779	0.0002	1.39E-06
266	0.03	0.000	0.019	0.1994	1.6773	0.0002	1.39E-06
267	1.39	0.672	0.032	0.2132	1.6767	0.0002	1.39E-06
268	0.02	0.114	0.227	0.2248	1.6761	0.0002	1.39E-06
269	0.00	0.000	0.153	0.2209	1.6755	0.0002	1.39E-06
270	0.01	0.000	0.146	0.2077	1.6749	0.0002	1.39E-06
271	0.04	0.000	0.074	0.2046	1.6744	0.0002	1.39E-06
272	0.01	0.000	0.064	0.1995	1.6738	0.0002	1.38E-06
273	0.07	0.000	0.041	0.2024	1.6732	0.0002	1.38E-06
274	0.83	0.270	0.184	0.2160	1.6726	0.0002	1.38E-06
275	0.01	0.000	0.156	0.2263	1.6720	0.0002	1.38E-06
276	0.08	0.000	0.099	0.2243	1.6714	0.0002	1.38E-06
277	0.31	0.032	0.169	0.2325	1.6708	0.0002	1.38E-06
278	0.30	0.026	0.326	0.2276	1.6703	0.0002	1.38E-06
279	0.17	0.018	0.176	0.2264	1.6697	0.0002	1.38E-06
280	0.09	0.000	0.094	0.2276	1.6691	0.0002	1.38E-06

281	0.00	0.000	0.096	0.2180	1.6685	0.0002	1.38E-06
282	0.00	0.000	0.096	0.2084	1.6679	0.0002	1.38E-06
283	0.07	0.000	0.101	0.2057	1.6673	0.0002	1.38E-06
284	0.00	0.000	0.069	0.1988	1.6668	0.0002	1.38E-06
285	0.05	0.000	0.034	0.2002	1.6662	0.0002	1.38E-06
286	0.95	0.380	0.098	0.2137	1.6656	0.0002	1.38E-06
287	0.00	0.077	0.074	0.2253	1.6650	0.0002	1.38E-06
288	0.12	0.002	0.081	0.2370	1.6644	0.0002	1.38E-06
289	0.00	0.000	0.078	0.2293	1.6639	0.0002	1.38E-06
290	0.00	0.000	0.078	0.2216	1.6633	0.0002	1.38E-06
291	0.00	0.000	0.123	0.2092	1.6627	0.0002	1.38E-06
292	0.00	0.000	0.107	0.1986	1.6621	0.0002	1.38E-06
293	0.00	0.000	0.014	0.1972	1.6615	0.0002	1.38E-06
294	0.14	0.000	0.033	0.2084	1.6609	0.0002	1.38E-06
295	0.46	0.060	0.222	0.2205	1.6604	0.0002	1.37E-06
296	0.27	0.033	0.192	0.2277	1.6602	0.0002	1.37E-06
297	0.00	0.000	0.149	0.2161	1.6599	0.0002	1.37E-06
298	0.00	0.000	0.119	0.2043	1.6593	0.0002	1.37E-06
299	0.00	0.000	0.057	0.1985	1.6587	0.0002	1.37E-06
300	0.00	0.000	0.014	0.1972	1.6582	0.0002	1.37E-06
301	0.00	0.000	0.001	0.1971	1.6576	0.0002	1.37E-06
302	0.00	0.000	0.001	0.1970	1.6570	0.0002	1.37E-06
303	0.00	0.000	0.000	0.1970	1.6564	0.0002	1.37E-06
304	0.00	0.000	0.000	0.1970	1.6558	0.0002	1.37E-06
305	0.00	0.000	0.000	0.1970	1.6553	0.0002	1.37E-06
306	0.00	0.000	0.000	0.1970	1.6547	0.0002	1.37E-06
307	0.00	0.000	0.000	0.1970	1.6541	0.0002	1.37E-06
308	0.00	0.000	0.000	0.1970	1.6535	0.0002	1.37E-06
309	0.00	0.000	0.000	0.1970	1.6529	0.0002	1.37E-06
310	0.00	0.000	0.000	0.1970	1.6524	0.0002	1.37E-06
311	0.00	0.000	0.000	0.1970	1.6518	0.0002	1.37E-06
312	0.00	0.000	0.000	0.1970	1.6512	0.0002	1.37E-06

313		0.00	0.000	0.000	0.1970	1.6506	0.0002	1.37E-06
314		0.00	0.000	0.000	0.1970	1.6500	0.0002	1.37E-06
315		0.00	0.000	0.000	0.1970	1.6495	0.0002	1.37E-06
316		0.19	0.023	0.013	0.2098	1.6489	0.0002	1.37E-06
317		0.22	0.043	0.046	0.2215	1.6483	0.0002	1.37E-06
318		0.00	0.000	0.050	0.2208	1.6477	0.0002	1.36E-06
319		0.00	0.000	0.011	0.2197	1.6472	0.0002	1.36E-06
320		0.00	0.000	0.011	0.2187	1.6466	0.0002	1.36E-06
321		0.00	0.000	0.010	0.2177	1.6460	0.0002	1.36E-06
322		0.00	0.000	0.010	0.2167	1.6454	0.0002	1.36E-06
323		0.00	0.000	0.010	0.2157	1.6448	0.0002	1.36E-06
324		0.00	0.000	0.010	0.2148	1.6443	0.0002	1.36E-06
325	*	0.31	0.000	0.036	0.2168	1.6437	0.0002	1.36E-06
326		0.00	0.041	0.046	0.2295	1.6431	0.0002	1.36E-06
327		0.00	0.000	0.051	0.2285	1.6425	0.0002	1.36E-06
328		0.12	0.000	0.014	0.2394	1.6420	0.0002	1.36E-06
329	*	0.21	0.000	0.031	0.2414	1.6414	0.0002	1.36E-06
330		0.01	0.000	0.052	0.2525	1.6408	0.0002	1.36E-06
331		0.00	0.000	0.052	0.2473	1.6402	0.0002	1.36E-06
332		0.00	0.000	0.011	0.2462	1.6397	0.0002	1.36E-06
333		0.00	0.000	0.011	0.2451	1.6391	0.0002	1.36E-06
334		0.00	0.000	0.011	0.2441	1.6385	0.0002	1.36E-06
335		0.00	0.000	0.010	0.2430	1.6380	0.0002	1.36E-06
336	*	0.00	0.000	0.010	0.2420	1.6374	0.0002	1.36E-06
337	*	0.00	0.000	0.014	0.2410	1.6368	0.0002	1.36E-06
338		0.05	0.000	0.015	0.2445	1.6362	0.0002	1.36E-06
339	*	0.15	0.000	0.048	0.2465	1.6357	0.0002	1.36E-06
340	*	0.04	0.000	0.048	0.2485	1.6351	0.0002	1.36E-06
341	*	0.01	0.000	0.042	0.2505	1.6345	0.0002	1.35E-06
342	*	0.12	0.000	0.029	0.2525	1.6340	0.0002	1.35E-06
343	*	0.21	0.000	0.000	0.2545	1.6334	0.0002	1.35E-06
344	*	0.00	0.000	0.037	0.2565	1.6328	0.0002	1.35E-06

345	*	1.02	0.000	0.032	0.2584	1.6322	0.0002	1.35E-06
346		0.00	0.597	0.000	0.2712	1.6317	0.0002	1.35E-06
347		0.00	0.127	0.091	0.2828	1.6311	0.0002	1.35E-06
348		0.00	0.000	0.155	0.2795	1.6305	0.0002	1.35E-06
349		0.09	0.000	0.086	0.2804	1.6299	0.0002	1.35E-06
350		0.02	0.000	0.112	0.2717	1.6294	0.0002	1.35E-06
351		0.98	0.423	0.118	0.2846	1.6288	0.0002	1.35E-06
352		0.00	0.000	0.238	0.2922	1.6282	0.0002	1.35E-06
353		0.00	0.000	0.084	0.2839	1.6277	0.0002	1.35E-06
354		0.00	0.000	0.090	0.2749	1.6271	0.0002	1.35E-06
355	*	0.00	0.000	0.046	0.2703	1.6265	0.0002	1.35E-06
356	*	0.36	0.000	0.017	0.2723	1.6260	0.0002	1.35E-06
357	*	0.00	0.000	0.021	0.2743	1.6254	0.0002	1.35E-06
358		0.00	0.056	0.043	0.2870	1.6248	0.0002	1.35E-06
359		0.00	0.000	0.141	0.2785	1.6243	0.0002	1.35E-06
360		0.00	0.000	0.060	0.2725	1.6239	0.0002	1.35E-06
361		0.00	0.000	0.051	0.2674	1.6237	0.0002	1.35E-06
362		0.00	0.000	0.087	0.2587	1.6238	0.0002	1.35E-06
363		0.00	0.000	0.069	0.2518	1.6242	0.0002	1.35E-06
364		0.00	0.000	0.076	0.2442	1.6240	0.0002	1.35E-06
365	*	0.03	0.000	0.047	0.2424	1.6235	0.0002	1.35E-06

* = Frozen (air or soil)

Annual Totals for Year 6			
	inches	cubic feet	percent
Precipitation	52.28	189,782.8	100.00
Runoff	18.555	67,355.8	35.49
Evapotranspiration	34.000	123,418.7	65.03
Recirculation into Layer 1	0.0665	241.5	0.13
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0665	241.5	0.13
Percolation/Leakage through Layer 5	0.000487	1.7662	0.00
Average Head on Top of Layer 4	1.6077	---	---
Change in Water Storage	-0.2738	-993.8	-0.52
Soil Water at Start of Year	294.1105	1,067,621.2	562.55
Soil Water at End of Year	293.9253	1,066,948.7	562.19
Snow Water at Start of Year	0.0885	321.3	0.17
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0664	-241.2	-0.13

Daily Output for Year 7

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.063	0.2362	1.6229	0.0002	1.35E-06
2			0.00	0.000	0.087	0.2275	1.6223	0.0002	1.35E-06
3			0.00	0.000	0.074	0.2202	1.6223	0.0002	1.35E-06
4			0.00	0.000	0.058	0.2143	1.6219	0.0002	1.35E-06
5	*		0.00	0.000	0.000	0.2143	1.6213	0.0002	1.34E-06
6	*		0.00	0.000	0.044	0.2099	1.6207	0.0002	1.34E-06
7	*		0.01	0.000	0.006	0.2100	1.6202	0.0002	1.34E-06
8			0.00	0.000	0.058	0.2042	1.6196	0.0002	1.34E-06
9			0.00	0.000	0.045	0.1994	1.6190	0.0002	1.34E-06
10	*		0.00	0.000	0.000	0.1995	1.6266	0.0002	1.35E-06
11	*		0.00	0.000	0.000	0.1995	1.6260	0.0002	1.35E-06
12	*		0.09	0.000	0.037	0.2015	1.6255	0.0002	1.35E-06
13	*		0.08	0.000	0.000	0.2035	1.6249	0.0002	1.35E-06
14	*		0.01	0.000	0.025	0.2054	1.6243	0.0002	1.35E-06
15	*		0.02	0.000	0.028	0.2074	1.6238	0.0002	1.35E-06
16			0.33	0.098	0.041	0.2202	1.6232	0.0002	1.35E-06
17			0.15	0.032	0.069	0.2318	1.6226	0.0002	1.35E-06
18	*		0.16	0.000	0.036	0.2342	1.6221	0.0002	1.35E-06
19	*		0.00	0.000	0.040	0.2366	1.6215	0.0002	1.34E-06
20	*	*	0.00	0.000	0.016	0.2366	1.6209	0.0002	1.34E-06
21	*	*	0.10	0.000	0.020	0.2367	1.6204	0.0002	1.34E-06
22	*	*	0.00	0.000	0.016	0.2367	1.6198	0.0002	1.34E-06
23	*	*	0.00	0.000	0.032	0.2367	1.6192	0.0002	1.34E-06
24	*	*	0.00	0.000	0.034	0.2367	1.6186	0.0002	1.34E-06

25		*	0.00	0.000	0.050	0.2367	1.6181	0.0002	1.34E-06
26		*	0.00	0.000	0.000	0.2367	1.6175	0.0002	1.34E-06
27		*	0.00	0.000	0.000	0.2368	1.6169	0.0002	1.34E-06
28			0.00	0.000	0.105	0.2263	1.6164	0.0002	1.34E-06
29			0.00	0.000	0.163	0.2101	1.6158	0.0002	1.34E-06
30			0.00	0.000	0.113	0.1988	1.6152	0.0002	1.34E-06
31			0.00	0.000	0.009	0.1979	1.6147	0.0002	1.34E-06
32			0.00	0.000	0.005	0.1975	1.6141	0.0002	1.34E-06
33			0.00	0.000	0.005	0.1970	1.6136	0.0002	1.34E-06
34			0.00	0.000	0.000	0.1970	1.6130	0.0002	1.34E-06
35			0.09	0.000	0.007	0.2053	1.6124	0.0002	1.34E-06
36			0.57	0.205	0.034	0.2185	1.6119	0.0002	1.34E-06
37			0.08	0.016	0.137	0.2301	1.6113	0.0002	1.34E-06
38			0.00	0.000	0.182	0.2135	1.6107	0.0002	1.34E-06
39			0.00	0.000	0.093	0.2042	1.6102	0.0002	1.34E-06
40			0.00	0.000	0.048	0.1995	1.6096	0.0002	1.34E-06
41			0.00	0.000	0.024	0.1971	1.6091	0.0002	1.34E-06
42			0.00	0.000	0.001	0.1970	1.6085	0.0002	1.34E-06
43			0.00	0.000	0.000	0.1970	1.6079	0.0002	1.33E-06
44			0.00	0.000	0.000	0.1970	1.6074	0.0002	1.33E-06
45			0.00	0.000	0.000	0.1970	1.6068	0.0002	1.33E-06
46			0.00	0.000	0.000	0.1970	1.6062	0.0002	1.33E-06
47			0.00	0.000	0.000	0.1970	1.6057	0.0002	1.33E-06
48	*		0.00	0.000	0.000	0.1970	1.6051	0.0002	1.33E-06
49	*		0.00	0.000	0.000	0.1971	1.6046	0.0002	1.33E-06
50	*		0.00	0.000	0.000	0.1971	1.6040	0.0002	1.33E-06
51	*		0.00	0.000	0.000	0.1971	1.6034	0.0002	1.33E-06
52			0.00	0.000	0.001	0.1970	1.6029	0.0002	1.33E-06
53			0.00	0.000	0.000	0.1970	1.6023	0.0002	1.33E-06
54			0.03	0.000	0.006	0.1993	1.6018	0.0002	1.33E-06
55			0.00	0.000	0.002	0.1991	1.6012	0.0002	1.33E-06
56	*		0.00	0.000	0.004	0.1987	1.6006	0.0002	1.33E-06

57		0.00	0.000	0.004	0.1983	1.6001	0.0002	1.33E-06
58		0.00	0.000	0.004	0.1980	1.5995	0.0002	1.33E-06
59		0.10	0.000	0.008	0.2077	1.5990	0.0002	1.33E-06
60		0.54	0.196	0.022	0.2209	1.5984	0.0002	1.33E-06
61		0.00	0.000	0.204	0.2201	1.5978	0.0002	1.33E-06
62		0.09	0.000	0.053	0.2237	1.5973	0.0002	1.33E-06
63		0.17	0.010	0.079	0.2305	1.5967	0.0002	1.33E-06
64	*	0.01	0.000	0.061	0.2263	1.5962	0.0002	1.33E-06
65	*	0.00	0.000	0.032	0.2231	1.5956	0.0002	1.33E-06
66		0.00	0.000	0.058	0.2173	1.5950	0.0002	1.32E-06
67		0.00	0.000	0.095	0.2079	1.5945	0.0002	1.32E-06
68	*	0.00	0.000	0.000	0.2079	1.5939	0.0002	1.32E-06
69		0.00	0.000	0.048	0.2031	1.5934	0.0002	1.32E-06
70		0.00	0.000	0.027	0.2005	1.5928	0.0002	1.32E-06
71		0.00	0.000	0.033	0.1972	1.5923	0.0002	1.32E-06
72		0.07	0.000	0.009	0.2030	1.5917	0.0002	1.32E-06
73		0.00	0.000	0.013	0.2017	1.5912	0.0002	1.32E-06
74		0.02	0.000	0.022	0.2017	1.5906	0.0002	1.32E-06
75	*	0.00	0.000	0.012	0.2005	1.5900	0.0002	1.32E-06
76		0.00	0.000	0.012	0.1993	1.5895	0.0002	1.32E-06
77		0.00	0.000	0.005	0.1988	1.5889	0.0002	1.32E-06
78		0.00	0.000	0.005	0.1983	1.5884	0.0002	1.32E-06
79		0.00	0.000	0.004	0.1980	1.5878	0.0002	1.32E-06
80		0.79	0.311	0.024	0.2135	1.5873	0.0002	1.32E-06
81		0.26	0.118	0.200	0.2251	1.5867	0.0002	1.32E-06
82		0.00	0.000	0.230	0.2139	1.5861	0.0002	1.32E-06
83		0.00	0.000	0.084	0.2055	1.5856	0.0002	1.32E-06
84		0.00	0.000	0.066	0.1989	1.5850	0.0002	1.32E-06
85		0.00	0.000	0.018	0.1971	1.5845	0.0002	1.32E-06
86		0.00	0.000	0.001	0.1971	1.5839	0.0002	1.32E-06
87		0.00	0.000	0.001	0.1970	1.5834	0.0002	1.32E-06
88		0.18	0.019	0.023	0.2089	1.5828	0.0002	1.32E-06

89		0.00	0.000	0.035	0.2073	1.5823	0.0002	1.32E-06
90		0.00	0.000	0.023	0.2051	1.5817	0.0002	1.31E-06
91		0.19	0.028	0.023	0.2161	1.5812	0.0002	1.31E-06
92		0.00	0.000	0.042	0.2147	1.5806	0.0002	1.31E-06
93		0.01	0.000	0.021	0.2134	1.5801	0.0002	1.31E-06
94		0.00	0.000	0.016	0.2118	1.5795	0.0002	1.31E-06
95		0.00	0.000	0.016	0.2102	1.5789	0.0002	1.31E-06
96		0.00	0.000	0.015	0.2087	1.5784	0.0002	1.31E-06
97		0.00	0.000	0.014	0.2073	1.5778	0.0002	1.31E-06
98		0.03	0.000	0.018	0.2087	1.5773	0.0002	1.31E-06
99		0.00	0.000	0.014	0.2073	1.5767	0.0002	1.31E-06
100		0.00	0.000	0.015	0.2058	1.5762	0.0002	1.31E-06
101		0.00	0.000	0.015	0.2043	1.5756	0.0002	1.31E-06
102		0.00	0.000	0.012	0.2031	1.5751	0.0002	1.31E-06
103		0.08	0.000	0.017	0.2090	1.5745	0.0002	1.31E-06
104		0.00	0.000	0.010	0.2080	1.5740	0.0002	1.31E-06
105		0.00	0.000	0.008	0.2072	1.5734	0.0002	1.31E-06
106		0.00	0.000	0.010	0.2062	1.5729	0.0002	1.31E-06
107		0.00	0.000	0.011	0.2051	1.5723	0.0002	1.31E-06
108		0.00	0.000	0.011	0.2040	1.5718	0.0002	1.31E-06
109		0.00	0.000	0.011	0.2030	1.5712	0.0002	1.31E-06
110		0.00	0.000	0.010	0.2019	1.5707	0.0002	1.31E-06
111		0.00	0.000	0.010	0.2010	1.5701	0.0002	1.31E-06
112		0.02	0.000	0.014	0.2012	1.5696	0.0002	1.31E-06
113	*	0.06	0.000	0.068	0.2002	1.5690	0.0002	1.30E-06
114	*	0.62	0.000	0.035	0.2022	1.5685	0.0002	1.30E-06
115	*	0.15	0.000	0.049	0.2042	1.5679	0.0002	1.30E-06
116		0.23	0.392	0.000	0.2170	1.5674	0.0002	1.30E-06
117		0.00	0.000	0.294	0.2238	1.5668	0.0002	1.30E-06
118		0.00	0.000	0.127	0.2111	1.5663	0.0002	1.30E-06
119		0.00	0.000	0.117	0.1995	1.5658	0.0002	1.30E-06
120	*	0.00	0.000	0.023	0.1971	1.5652	0.0002	1.30E-06

121	0.00	0.000	0.001	0.1971	1.5647	0.0002	1.30E-06
122	0.00	0.000	0.001	0.1970	1.5641	0.0002	1.30E-06
123	0.00	0.000	0.000	0.1970	1.5636	0.0002	1.30E-06
124	0.25	0.051	0.033	0.2089	1.5630	0.0002	1.30E-06
125	0.00	0.000	0.068	0.2072	1.5625	0.0002	1.30E-06
126	1.51	0.736	0.040	0.2219	1.5619	0.0002	1.30E-06
127	0.60	0.333	0.423	0.2336	1.5614	0.0002	1.30E-06
128	0.00	0.000	0.351	0.2300	1.5608	0.0002	1.30E-06
129	0.00	0.000	0.279	0.2021	1.5603	0.0002	1.30E-06
130	0.00	0.000	0.038	0.1983	1.5597	0.0002	1.30E-06
131	0.32	0.043	0.194	0.2028	1.5592	0.0002	1.30E-06
132	0.19	0.031	0.103	0.2100	1.5587	0.0002	1.30E-06
133	0.09	0.000	0.106	0.2118	1.5581	0.0002	1.30E-06
134	0.00	0.000	0.092	0.2026	1.5576	0.0002	1.30E-06
135	0.00	0.000	0.042	0.1984	1.5570	0.0002	1.30E-06
136	0.00	0.000	0.014	0.1970	1.5565	0.0002	1.30E-06
137	0.00	0.000	0.000	0.1970	1.5559	0.0002	1.29E-06
138	0.00	0.000	0.000	0.1970	1.5554	0.0002	1.29E-06
139	0.16	0.010	0.020	0.2092	1.5548	0.0002	1.29E-06
140	0.00	0.000	0.024	0.2079	1.5543	0.0002	1.29E-06
141	0.63	0.227	0.035	0.2222	1.5537	0.0002	1.29E-06
142	0.00	0.000	0.189	0.2255	1.5532	0.0002	1.29E-06
143	0.39	0.028	0.268	0.2321	1.5527	0.0002	1.29E-06
144	0.00	0.000	0.124	0.2225	1.5521	0.0002	1.29E-06
145	0.21	0.022	0.201	0.2192	1.5516	0.0002	1.29E-06
146	0.19	0.024	0.183	0.2176	1.5510	0.0002	1.29E-06
147	0.06	0.000	0.095	0.2164	1.5505	0.0002	1.29E-06
148	1.51	0.756	0.065	0.2289	1.5499	0.0002	1.29E-06
149	0.01	0.140	0.179	0.2406	1.5494	0.0002	1.29E-06
150	0.07	0.000	0.269	0.2346	1.5489	0.0002	1.29E-06
151	0.02	0.000	0.227	0.2140	1.5483	0.0002	1.29E-06
152	0.09	0.000	0.163	0.2064	1.5478	0.0002	1.29E-06

153	0.10	0.000	0.080	0.2085	1.5472	0.0002	1.29E-06
154	0.06	0.000	0.081	0.2063	1.5467	0.0002	1.29E-06
155	0.21	0.032	0.099	0.2113	1.5461	0.0002	1.29E-06
156	0.02	0.000	0.074	0.2095	1.5456	0.0002	1.29E-06
157	0.67	0.248	0.056	0.2222	1.5451	0.0002	1.29E-06
158	0.06	0.000	0.364	0.2160	1.5445	0.0002	1.29E-06
159	0.24	0.021	0.256	0.2098	1.5440	0.0002	1.29E-06
160	0.02	0.000	0.137	0.1999	1.5434	0.0002	1.29E-06
161	0.63	0.161	0.151	0.2158	1.5429	0.0002	1.28E-06
162	0.20	0.030	0.267	0.2191	1.5424	0.0002	1.28E-06
163	0.00	0.000	0.133	0.2087	1.5418	0.0002	1.28E-06
164	0.00	0.000	0.090	0.1997	1.5413	0.0002	1.28E-06
165	0.00	0.000	0.025	0.1972	1.5407	0.0002	1.28E-06
166	0.00	0.000	0.001	0.1971	1.5402	0.0002	1.28E-06
167	0.51	0.147	0.054	0.2131	1.5397	0.0002	1.28E-06
168	0.83	0.366	0.157	0.2248	1.5391	0.0002	1.28E-06
169	0.00	0.000	0.327	0.2255	1.5386	0.0002	1.28E-06
170	0.00	0.000	0.097	0.2157	1.5381	0.0002	1.28E-06
171	0.88	0.201	0.367	0.2301	1.5379	0.0002	1.28E-06
172	0.00	0.000	0.244	0.2229	1.5374	0.0002	1.28E-06
173	0.00	0.000	0.111	0.2118	1.5369	0.0002	1.28E-06
174	0.00	0.000	0.129	0.1990	1.5363	0.0002	1.28E-06
175	0.00	0.000	0.017	0.1973	1.5358	0.0002	1.28E-06
176	0.00	0.000	0.002	0.1972	1.5352	0.0002	1.28E-06
177	0.00	0.000	0.002	0.1970	1.5347	0.0002	1.28E-06
178	0.42	0.105	0.055	0.2130	1.5342	0.0002	1.28E-06
179	0.30	0.027	0.327	0.2152	1.5336	0.0002	1.28E-06
180	0.45	0.084	0.198	0.2268	1.5331	0.0002	1.28E-06
181	0.00	0.000	0.209	0.2142	1.5325	0.0002	1.28E-06
182	0.00	0.000	0.136	0.2006	1.5320	0.0002	1.28E-06
183	0.00	0.000	0.027	0.1979	1.5315	0.0002	1.28E-06
184	0.00	0.000	0.005	0.1975	1.5309	0.0002	1.28E-06

185	0.13	0.000	0.018	0.2092	1.5304	0.0002	1.28E-06
186	0.14	0.003	0.029	0.2198	1.5299	0.0002	1.27E-06
187	0.03	0.000	0.024	0.2210	1.5293	0.0002	1.27E-06
188	0.00	0.000	0.024	0.2185	1.5288	0.0002	1.27E-06
189	0.00	0.000	0.022	0.2163	1.5283	0.0002	1.27E-06
190	0.00	0.000	0.023	0.2141	1.5277	0.0002	1.27E-06
191	0.00	0.000	0.022	0.2119	1.5272	0.0002	1.27E-06
192	0.00	0.000	0.022	0.2097	1.5267	0.0002	1.27E-06
193	0.00	0.000	0.022	0.2075	1.5261	0.0002	1.27E-06
194	0.61	0.213	0.035	0.2222	1.5256	0.0002	1.27E-06
195	0.42	0.166	0.180	0.2338	1.5251	0.0002	1.27E-06
196	0.28	0.032	0.325	0.2391	1.5245	0.0002	1.27E-06
197	0.00	0.000	0.233	0.2190	1.5240	0.0002	1.27E-06
198	0.01	0.000	0.114	0.2081	1.5235	0.0002	1.27E-06
199	0.00	0.000	0.101	0.1980	1.5229	0.0002	1.27E-06
200	0.20	0.026	0.075	0.2058	1.5224	0.0002	1.27E-06
201	0.00	0.000	0.055	0.2029	1.5219	0.0002	1.27E-06
202	0.00	0.000	0.037	0.1992	1.5213	0.0002	1.27E-06
203	0.00	0.000	0.016	0.1976	1.5208	0.0002	1.27E-06
204	0.00	0.000	0.006	0.1970	1.5203	0.0002	1.27E-06
205	0.00	0.000	0.000	0.1970	1.5197	0.0002	1.27E-06
206	0.00	0.000	0.000	0.1970	1.5192	0.0002	1.27E-06
207	0.00	0.000	0.000	0.1970	1.5187	0.0002	1.27E-06
208	0.00	0.000	0.000	0.1970	1.5181	0.0002	1.27E-06
209	0.00	0.000	0.000	0.1970	1.5176	0.0002	1.27E-06
210	0.00	0.000	0.000	0.1970	1.5171	0.0002	1.27E-06
211	0.13	0.000	0.010	0.2091	1.5165	0.0002	1.26E-06
212	0.07	0.000	0.018	0.2139	1.5160	0.0002	1.26E-06
213	0.00	0.000	0.016	0.2123	1.5155	0.0002	1.26E-06
214	0.00	0.000	0.017	0.2107	1.5150	0.0002	1.26E-06
215	0.00	0.000	0.023	0.2084	1.5144	0.0002	1.26E-06
216	1.28	0.604	0.029	0.2224	1.5139	0.0002	1.26E-06

217	0.81	0.380	0.484	0.2341	1.5134	0.0002	1.26E-06
218	0.30	0.031	0.513	0.2389	1.5128	0.0002	1.26E-06
219	0.18	0.009	0.377	0.2208	1.5123	0.0002	1.26E-06
220	1.51	0.709	0.182	0.2319	1.5118	0.0002	1.26E-06
221	0.00	0.034	0.338	0.2435	1.5112	0.0002	1.26E-06
222	0.00	0.000	0.336	0.2133	1.5107	0.0002	1.26E-06
223	0.26	0.043	0.145	0.2164	1.5102	0.0002	1.26E-06
224	0.00	0.000	0.150	0.2056	1.5097	0.0002	1.26E-06
225	0.00	0.000	0.067	0.1989	1.5091	0.0002	1.26E-06
226	0.00	0.000	0.019	0.1970	1.5086	0.0002	1.26E-06
227	0.00	0.000	0.000	0.1970	1.5081	0.0002	1.26E-06
228	0.00	0.000	0.000	0.1970	1.5075	0.0002	1.26E-06
229	0.00	0.000	0.000	0.1970	1.5070	0.0002	1.26E-06
230	0.00	0.000	0.000	0.1970	1.5065	0.0002	1.26E-06
231	0.00	0.000	0.000	0.1970	1.5060	0.0002	1.26E-06
232	0.00	0.000	0.000	0.1970	1.5054	0.0002	1.26E-06
233	0.00	0.000	0.000	0.1970	1.5049	0.0002	1.26E-06
234	0.05	0.000	0.010	0.2009	1.5044	0.0002	1.26E-06
235	0.02	0.000	0.009	0.2019	1.5038	0.0002	1.26E-06
236	0.00	0.000	0.013	0.2006	1.5033	0.0002	1.25E-06
237	0.00	0.000	0.014	0.1992	1.5028	0.0002	1.25E-06
238	0.00	0.000	0.006	0.1987	1.5023	0.0002	1.25E-06
239	0.00	0.000	0.005	0.1981	1.5017	0.0002	1.25E-06
240	0.00	0.000	0.004	0.1977	1.5012	0.0002	1.25E-06
241	0.00	0.000	0.004	0.1973	1.5007	0.0002	1.25E-06
242	0.00	0.000	0.003	0.1971	1.5002	0.0002	1.25E-06
243	0.00	0.000	0.001	0.1970	1.4996	0.0002	1.25E-06
244	0.00	0.000	0.000	0.1970	1.4991	0.0002	1.25E-06
245	0.00	0.000	0.003	0.1970	1.4986	0.0002	1.25E-06
246	0.44	0.129	0.024	0.2132	1.4981	0.0002	1.25E-06
247	0.02	0.000	0.124	0.2161	1.4975	0.0002	1.25E-06
248	0.51	0.178	0.023	0.2294	1.4970	0.0002	1.25E-06

249	0.07	0.000	0.209	0.2329	1.4965	0.0002	1.25E-06
250	0.00	0.000	0.112	0.2217	1.4960	0.0002	1.25E-06
251	0.00	0.000	0.113	0.2104	1.4955	0.0002	1.25E-06
252	0.00	0.000	0.090	0.2014	1.4949	0.0002	1.25E-06
253	0.00	0.000	0.041	0.1973	1.4944	0.0002	1.25E-06
254	0.00	0.000	0.002	0.1972	1.4939	0.0002	1.25E-06
255	0.00	0.000	0.002	0.1970	1.4934	0.0002	1.25E-06
256	0.00	0.000	0.000	0.1970	1.4928	0.0002	1.25E-06
257	0.24	0.050	0.020	0.2093	1.4923	0.0002	1.25E-06
258	0.00	0.000	0.062	0.2082	1.4918	0.0002	1.25E-06
259	0.00	0.000	0.017	0.2065	1.4913	0.0002	1.25E-06
260	0.00	0.000	0.017	0.2049	1.4907	0.0002	1.25E-06
261	0.00	0.000	0.016	0.2033	1.4902	0.0002	1.24E-06
262	0.00	0.000	0.015	0.2018	1.4897	0.0002	1.24E-06
263	0.00	0.000	0.014	0.2004	1.4892	0.0002	1.24E-06
264	0.00	0.000	0.014	0.1990	1.4887	0.0002	1.24E-06
265	0.04	0.000	0.020	0.2010	1.4881	0.0002	1.24E-06
266	0.01	0.000	0.013	0.2003	1.4876	0.0002	1.24E-06
267	0.14	0.001	0.015	0.2127	1.4871	0.0002	1.24E-06
268	0.00	0.000	0.009	0.2119	1.4866	0.0002	1.24E-06
269	0.00	0.000	0.012	0.2108	1.4861	0.0002	1.24E-06
270	0.00	0.000	0.011	0.2097	1.4855	0.0002	1.24E-06
271	0.00	0.000	0.011	0.2086	1.4850	0.0002	1.24E-06
272	0.00	0.000	0.011	0.2076	1.4845	0.0002	1.24E-06
273	0.00	0.000	0.010	0.2066	1.4840	0.0002	1.24E-06
274	0.00	0.000	0.010	0.2056	1.4835	0.0002	1.24E-06
275	0.00	0.000	0.013	0.2047	1.4829	0.0002	1.24E-06
276	0.03	0.000	0.017	0.2062	1.4824	0.0002	1.24E-06
277	0.00	0.000	0.009	0.2053	1.4819	0.0002	1.24E-06
278	0.00	0.000	0.011	0.2042	1.4814	0.0002	1.24E-06
279	2.27	1.249	0.020	0.2183	1.4809	0.0002	1.24E-06
280	0.00	0.207	0.333	0.2300	1.4803	0.0002	1.24E-06

281		0.00	0.000	0.278	0.2229	1.4798	0.0002	1.24E-06
282		0.00	0.000	0.082	0.2147	1.4793	0.0002	1.24E-06
283		0.52	0.116	0.144	0.2294	1.4788	0.0002	1.24E-06
284		1.28	0.662	0.114	0.2411	1.4783	0.0002	1.24E-06
285		0.00	0.111	0.161	0.2527	1.4777	0.0002	1.24E-06
286		0.00	0.000	0.063	0.2575	1.4772	0.0002	1.23E-06
287		0.00	0.000	0.082	0.2493	1.4767	0.0002	1.23E-06
288		0.00	0.000	0.092	0.2401	1.4763	0.0002	1.23E-06
289		0.00	0.000	0.110	0.2291	1.4757	0.0002	1.23E-06
290		0.00	0.000	0.080	0.2211	1.4752	0.0002	1.23E-06
291		0.00	0.000	0.146	0.2065	1.4747	0.0002	1.23E-06
292		0.00	0.000	0.080	0.1986	1.4742	0.0002	1.23E-06
293		0.00	0.000	0.008	0.1978	1.4738	0.0002	1.23E-06
294		0.00	0.000	0.008	0.1970	1.4732	0.0002	1.23E-06
295	*	0.00	0.000	0.000	0.1970	1.4727	0.0002	1.23E-06
296	*	0.30	0.000	0.042	0.1990	1.4722	0.0002	1.23E-06
297		0.00	0.020	0.070	0.2123	1.4717	0.0002	1.23E-06
298		0.62	0.231	0.065	0.2239	1.4712	0.0002	1.23E-06
299		0.00	0.000	0.181	0.2282	1.4707	0.0002	1.23E-06
300		0.00	0.000	0.062	0.2221	1.4702	0.0002	1.23E-06
301		0.00	0.000	0.037	0.2184	1.4697	0.0002	1.23E-06
302	*	0.00	0.000	0.000	0.2184	1.4692	0.0002	1.23E-06
303		0.00	0.000	0.055	0.2129	1.4686	0.0002	1.23E-06
304		0.00	0.000	0.052	0.2077	1.4681	0.0002	1.23E-06
305	*	0.20	0.000	0.034	0.2097	1.4676	0.0002	1.23E-06
306	*	0.00	0.000	0.057	0.2117	1.4671	0.0002	1.23E-06
307		0.08	0.000	0.054	0.2211	1.4666	0.0002	1.23E-06
308		0.16	0.009	0.089	0.2267	1.4661	0.0002	1.23E-06
309		0.75	0.299	0.093	0.2383	1.4656	0.0002	1.23E-06
310		0.01	0.022	0.103	0.2499	1.4650	0.0002	1.23E-06
311		0.00	0.000	0.089	0.2433	1.4645	0.0002	1.22E-06
312	*	0.18	0.000	0.042	0.2453	1.4640	0.0002	1.22E-06

313	*	0.36	0.000	0.028	0.2473	1.4635	0.0002	1.22E-06
314	*	1.60	0.000	0.000	0.2493	1.4630	0.0002	1.22E-06
315		0.00	0.088	0.000	0.2620	1.4625	0.0002	1.22E-06
316		0.00	0.719	0.000	0.2736	1.4620	0.0002	1.22E-06
317		0.00	0.529	0.000	0.2853	1.4615	0.0002	1.22E-06
318		0.00	0.012	0.174	0.2969	1.4609	0.0002	1.22E-06
319		0.00	0.000	0.074	0.2907	1.4604	0.0002	1.22E-06
320		0.00	0.000	0.060	0.2846	1.4599	0.0002	1.22E-06
321		0.00	0.000	0.076	0.2770	1.4594	0.0002	1.22E-06
322		0.00	0.000	0.094	0.2677	1.4589	0.0002	1.22E-06
323		0.00	0.000	0.076	0.2601	1.4584	0.0002	1.22E-06
324	*	0.00	0.000	0.050	0.2551	1.4579	0.0002	1.22E-06
325	*	0.00	0.000	0.045	0.2506	1.4574	0.0002	1.22E-06
326	*	0.00	0.000	0.000	0.2506	1.4569	0.0002	1.22E-06
327	*	0.00	0.000	0.000	0.2506	1.4563	0.0002	1.22E-06
328	*	0.00	0.000	0.000	0.2506	1.4558	0.0002	1.22E-06
329	*	0.00	0.000	0.000	0.2506	1.4553	0.0002	1.22E-06
330	*	0.00	0.000	0.046	0.2461	1.4548	0.0002	1.22E-06
331	*	0.00	0.000	0.041	0.2420	1.4543	0.0002	1.22E-06
332	*	0.00	0.000	0.041	0.2379	1.4538	0.0002	1.22E-06
333	*	0.00	0.000	0.000	0.2379	1.4533	0.0002	1.22E-06
334	*	0.00	0.000	0.000	0.2379	1.4528	0.0002	1.22E-06
335		0.00	0.000	0.069	0.2311	1.4523	0.0002	1.22E-06
336		0.00	0.000	0.077	0.2233	1.4518	0.0002	1.22E-06
337		0.00	0.000	0.109	0.2124	1.4512	0.0002	1.21E-06
338		0.00	0.000	0.058	0.2066	1.4507	0.0002	1.21E-06
339		0.00	0.000	0.045	0.2020	1.4502	0.0002	1.21E-06
340	*	0.00	0.000	0.038	0.1983	1.4543	0.0002	1.22E-06
341	*	0.00	0.000	0.000	0.1983	1.4538	0.0002	1.22E-06
342	*	0.00	0.000	0.007	0.1970	1.4652	0.0002	1.23E-06
343	*	0.00	0.000	0.000	0.1970	1.4719	0.0002	1.23E-06
344	*	0.00	0.000	0.000	0.1970	1.4713	0.0002	1.23E-06

345			0.23	0.042	0.018	0.2095	1.4708	0.0002	1.23E-06
346			0.00	0.000	0.055	0.2085	1.4703	0.0002	1.23E-06
347	*		0.02	0.000	0.025	0.2085	1.4698	0.0002	1.23E-06
348	*		0.00	0.000	0.000	0.2085	1.4693	0.0002	1.23E-06
349	*	*	0.25	0.000	0.007	0.2085	1.4688	0.0002	1.23E-06
350	*	*	0.36	0.000	0.013	0.2085	1.4683	0.0002	1.23E-06
351		*	0.46	0.670	0.000	0.2116	1.4677	0.0002	1.23E-06
352	*	*	0.00	0.000	0.023	0.2116	1.4672	0.0002	1.23E-06
353	*	*	0.00	0.000	0.024	0.2116	1.4667	0.0002	1.23E-06
354	*	*	0.00	0.000	0.038	0.2116	1.4662	0.0002	1.23E-06
355	*	*	0.00	0.000	0.021	0.2117	1.4657	0.0002	1.23E-06
356	*	*	0.00	0.000	0.011	0.2117	1.4652	0.0002	1.23E-06
357	*	*	0.00	0.000	0.017	0.2117	1.4647	0.0002	1.22E-06
358	*	*	0.00	0.000	0.006	0.2117	1.4641	0.0002	1.22E-06
359	*	*	0.00	0.000	0.035	0.2117	1.4636	0.0002	1.22E-06
360		*	0.00	0.000	0.056	0.2117	1.4631	0.0002	1.22E-06
361		*	0.00	0.000	0.057	0.2118	1.4626	0.0002	1.22E-06
362	*	*	0.00	0.000	0.044	0.2118	1.4621	0.0002	1.22E-06
363		*	0.00	0.000	0.021	0.2118	1.4616	0.0002	1.22E-06
364	*	*	0.00	0.000	0.000	0.2118	1.4611	0.0002	1.22E-06
365	*	*	0.00	0.000	0.000	0.2118	1.4606	0.0002	1.22E-06

* = Frozen (air or soil)

Annual Totals for Year 7			
	inches	cubic feet	percent
Precipitation	34.85	126,491.9	100.00
Runoff	12.842	46,614.7	36.85
Evapotranspiration	22.363	81,179.1	64.18
Recirculation into Layer 1	0.0635	230.4	0.18
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0635	230.4	0.18
Percolation/Leakage through Layer 5	0.000466	1.6931	0.00
Average Head on Top of Layer 4	1.5337	---	---
Change in Water Storage	-0.3591	-1,303.4	-1.03
Soil Water at Start of Year	293.9253	1,066,948.7	843.49
Soil Water at End of Year	293.5662	1,065,645.3	842.46
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0635	-230.5	-0.18

Daily Output for Year 8

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1		*	0.00	0.000	0.000	0.2118	1.4600	0.0002	1.22E-06
2		*	0.00	0.000	0.000	0.2119	1.4595	0.0002	1.22E-06
3		*	0.00	0.000	0.000	0.2119	1.4590	0.0002	1.22E-06
4			0.00	0.000	0.035	0.2084	1.4585	0.0002	1.22E-06
5			0.00	0.000	0.064	0.2020	1.4580	0.0002	1.22E-06
6			0.00	0.000	0.039	0.1981	1.4575	0.0002	1.22E-06
7	*		0.00	0.000	0.000	0.1981	1.4570	0.0002	1.22E-06
8			0.00	0.000	0.011	0.1970	1.4565	0.0002	1.22E-06
9			0.00	0.000	0.000	0.1970	1.4560	0.0002	1.22E-06
10			0.00	0.000	0.000	0.1970	1.4555	0.0002	1.22E-06
11			0.00	0.000	0.000	0.1970	1.4550	0.0002	1.22E-06
12			0.00	0.000	0.000	0.1970	1.4544	0.0002	1.22E-06
13			0.00	0.000	0.000	0.1970	1.4539	0.0002	1.22E-06
14			0.00	0.000	0.000	0.1970	1.4534	0.0002	1.22E-06
15			0.00	0.000	0.000	0.1970	1.4529	0.0002	1.22E-06
16			0.00	0.000	0.000	0.1970	1.4524	0.0002	1.22E-06
17			0.61	0.206	0.036	0.2133	1.4519	0.0002	1.22E-06
18			0.00	0.000	0.134	0.2202	1.4514	0.0002	1.21E-06
19			0.00	0.000	0.042	0.2160	1.4509	0.0002	1.21E-06
20			0.00	0.000	0.098	0.2062	1.4504	0.0002	1.21E-06
21			0.00	0.000	0.073	0.1989	1.4499	0.0002	1.21E-06
22			0.00	0.000	0.018	0.1971	1.4494	0.0002	1.21E-06
23	*		0.00	0.000	0.000	0.1971	1.4489	0.0002	1.21E-06
24	*		0.00	0.000	0.000	0.1972	1.4483	0.0002	1.21E-06

25		0.00	0.000	0.001	0.1971	1.4478	0.0002	1.21E-06
26		0.00	0.000	0.002	0.1970	1.4473	0.0002	1.21E-06
27	*	0.19	0.000	0.029	0.1990	1.4468	0.0002	1.21E-06
28	*	0.00	0.000	0.016	0.2010	1.4463	0.0002	1.21E-06
29	*	0.00	0.000	0.013	0.2030	1.4458	0.0002	1.21E-06
30	*	0.00	0.000	0.029	0.2050	1.4453	0.0002	1.21E-06
31	*	0.00	0.000	0.019	0.2050	1.4448	0.0002	1.21E-06
32	*	0.00	0.000	0.000	0.2050	1.4443	0.0002	1.21E-06
33		0.00	0.000	0.017	0.2034	1.4438	0.0002	1.21E-06
34		1.29	0.606	0.039	0.2179	1.4433	0.0002	1.21E-06
35		0.44	0.333	0.159	0.2296	1.4428	0.0002	1.21E-06
36		0.10	0.084	0.151	0.2412	1.4423	0.0002	1.21E-06
37		0.00	0.000	0.134	0.2367	1.4418	0.0002	1.21E-06
38		0.49	0.129	0.088	0.2516	1.4413	0.0002	1.21E-06
39		0.00	0.000	0.087	0.2549	1.4408	0.0002	1.21E-06
40		0.00	0.000	0.082	0.2467	1.4403	0.0002	1.21E-06
41	*	0.00	0.000	0.041	0.2427	1.4398	0.0002	1.21E-06
42	*	0.00	0.000	0.000	0.2427	1.4393	0.0002	1.21E-06
43		0.00	0.000	0.087	0.2340	1.4388	0.0002	1.21E-06
44		0.00	0.000	0.099	0.2242	1.4383	0.0002	1.20E-06
45		0.00	0.000	0.183	0.2059	1.4378	0.0002	1.20E-06
46		0.00	0.000	0.078	0.1982	1.4373	0.0002	1.20E-06
47		0.00	0.000	0.007	0.1975	1.4367	0.0002	1.20E-06
48		0.00	0.000	0.005	0.1970	1.4362	0.0002	1.20E-06
49		0.00	0.000	0.000	0.1970	1.4357	0.0002	1.20E-06
50		0.00	0.000	0.000	0.1970	1.4352	0.0002	1.20E-06
51	*	0.00	0.000	0.000	0.1970	1.4347	0.0002	1.20E-06
52	*	0.00	0.000	0.000	0.1970	1.4342	0.0002	1.20E-06
53	*	0.00	0.000	0.000	0.1970	1.4337	0.0002	1.20E-06
54	*	0.00	0.000	0.000	0.1971	1.4332	0.0002	1.20E-06
55	*	0.00	0.000	0.000	0.1971	1.4327	0.0002	1.20E-06
56		0.00	0.000	0.001	0.1970	1.4322	0.0002	1.20E-06

57	*	0.00	0.000	0.000	0.1970	1.4317	0.0002	1.20E-06
58		0.00	0.000	0.000	0.1970	1.4312	0.0002	1.20E-06
59		0.00	0.000	0.000	0.1970	1.4308	0.0002	1.20E-06
60	*	0.00	0.000	0.000	0.1970	1.4303	0.0002	1.20E-06
61	*	0.00	0.000	0.000	0.1970	1.4298	0.0002	1.20E-06
62		0.43	0.118	0.028	0.2133	1.4292	0.0002	1.20E-06
63		0.20	0.038	0.135	0.2242	1.4287	0.0002	1.20E-06
64		0.12	0.000	0.075	0.2329	1.4282	0.0002	1.20E-06
65		0.00	0.000	0.083	0.2246	1.4277	0.0002	1.20E-06
66		0.00	0.000	0.081	0.2165	1.4272	0.0002	1.20E-06
67		0.13	0.000	0.095	0.2197	1.4267	0.0002	1.20E-06
68		0.01	0.000	0.056	0.2147	1.4262	0.0002	1.20E-06
69		0.00	0.000	0.038	0.2110	1.4257	0.0002	1.20E-06
70		0.00	0.000	0.032	0.2078	1.4252	0.0002	1.19E-06
71	*	0.00	0.000	0.000	0.2078	1.4247	0.0002	1.19E-06
72		0.00	0.000	0.027	0.2051	1.4243	0.0002	1.19E-06
73		0.00	0.000	0.021	0.2030	1.4238	0.0002	1.19E-06
74		0.00	0.000	0.019	0.2011	1.4233	0.0002	1.19E-06
75		0.00	0.000	0.016	0.1995	1.4228	0.0002	1.19E-06
76		0.00	0.000	0.016	0.1979	1.4223	0.0002	1.19E-06
77		0.00	0.000	0.009	0.1970	1.4218	0.0002	1.19E-06
78		0.00	0.000	0.000	0.1970	1.4213	0.0002	1.19E-06
79		0.00	0.000	0.000	0.1970	1.4208	0.0002	1.19E-06
80		0.00	0.000	0.000	0.1970	1.4203	0.0002	1.19E-06
81		0.08	0.000	0.008	0.2039	1.4198	0.0002	1.19E-06
82		0.13	0.000	0.014	0.2152	1.4193	0.0002	1.19E-06
83	*	0.00	0.000	0.008	0.2144	1.4188	0.0002	1.19E-06
84	*	0.00	0.000	0.004	0.2144	1.4183	0.0002	1.19E-06
85		0.00	0.000	0.012	0.2133	1.4178	0.0002	1.19E-06
86		0.00	0.000	0.011	0.2121	1.4173	0.0002	1.19E-06
87	*	0.00	0.000	0.000	0.2121	1.4168	0.0002	1.19E-06
88		0.18	0.018	0.017	0.2246	1.4163	0.0002	1.19E-06

89	0.00	0.000	0.031	0.2233	1.4158	0.0002	1.19E-06
90	0.00	0.000	0.013	0.2221	1.4153	0.0002	1.19E-06
91	0.37	0.106	0.022	0.2353	1.4148	0.0002	1.19E-06
92	0.19	0.027	0.211	0.2383	1.4143	0.0002	1.19E-06
93	0.00	0.000	0.170	0.2239	1.4138	0.0002	1.19E-06
94	0.00	0.000	0.116	0.2123	1.4133	0.0002	1.19E-06
95	1.07	0.455	0.065	0.2279	1.4128	0.0002	1.19E-06
96	0.28	0.179	0.201	0.2395	1.4123	0.0002	1.18E-06
97	0.00	0.000	0.223	0.2352	1.4118	0.0002	1.18E-06
98	0.00	0.000	0.169	0.2183	1.4113	0.0002	1.18E-06
99	0.06	0.000	0.136	0.2106	1.4108	0.0002	1.18E-06
100	0.12	0.000	0.073	0.2149	1.4103	0.0002	1.18E-06
101	0.50	0.092	0.187	0.2280	1.4099	0.0002	1.18E-06
102	0.72	0.273	0.191	0.2397	1.4094	0.0002	1.18E-06
103	0.97	0.453	0.292	0.2513	1.4089	0.0002	1.18E-06
104	0.64	0.277	0.375	0.2629	1.4084	0.0002	1.18E-06
105	0.00	0.000	0.226	0.2613	1.4079	0.0002	1.18E-06
106	0.00	0.000	0.261	0.2352	1.4074	0.0002	1.18E-06
107	0.00	0.000	0.141	0.2212	1.4069	0.0002	1.18E-06
108	0.00	0.000	0.093	0.2120	1.4064	0.0002	1.18E-06
109	1.13	0.480	0.082	0.2282	1.4059	0.0002	1.18E-06
110	0.22	0.146	0.225	0.2399	1.4054	0.0002	1.18E-06
111	0.00	0.000	0.231	0.2316	1.4049	0.0002	1.18E-06
112	0.00	0.000	0.302	0.2013	1.4047	0.0002	1.18E-06
113	0.00	0.000	0.027	0.1986	1.4052	0.0002	1.18E-06
114	0.00	0.000	0.016	0.1970	1.4048	0.0002	1.18E-06
115	0.16	0.005	0.040	0.2077	1.4043	0.0002	1.18E-06
116	1.00	0.439	0.071	0.2193	1.4038	0.0002	1.18E-06
117	0.80	0.469	0.177	0.2309	1.4033	0.0002	1.18E-06
118	0.15	0.097	0.264	0.2426	1.4028	0.0002	1.18E-06
119	0.00	0.000	0.205	0.2317	1.4023	0.0002	1.18E-06
120	1.30	0.509	0.303	0.2456	1.4018	0.0002	1.18E-06

121	0.00	0.000	0.302	0.2501	1.4013	0.0002	1.18E-06
122	0.00	0.000	0.188	0.2314	1.4008	0.0002	1.18E-06
123	0.00	0.000	0.100	0.2214	1.4003	0.0002	1.18E-06
124	0.00	0.000	0.143	0.2072	1.3998	0.0002	1.18E-06
125	0.00	0.000	0.089	0.1983	1.3994	0.0002	1.17E-06
126	0.00	0.000	0.006	0.1976	1.3989	0.0002	1.17E-06
127	0.17	0.010	0.068	0.2061	1.3984	0.0002	1.17E-06
128	0.00	0.000	0.037	0.2035	1.3979	0.0002	1.17E-06
129	0.00	0.000	0.031	0.2004	1.3974	0.0002	1.17E-06
130	0.00	0.000	0.024	0.1980	1.3969	0.0002	1.17E-06
131	0.00	0.000	0.008	0.1972	1.3964	0.0002	1.17E-06
132	1.25	0.573	0.039	0.2133	1.3959	0.0002	1.17E-06
133	0.22	0.194	0.194	0.2249	1.3954	0.0002	1.17E-06
134	0.00	0.000	0.253	0.2190	1.3950	0.0002	1.17E-06
135	0.00	0.000	0.191	0.1999	1.3945	0.0002	1.17E-06
136	0.00	0.000	0.026	0.1974	1.3940	0.0002	1.17E-06
137	0.00	0.000	0.006	0.1972	1.3935	0.0002	1.17E-06
138	0.14	0.000	0.026	0.2089	1.3930	0.0002	1.17E-06
139	0.00	0.000	0.021	0.2068	1.3925	0.0002	1.17E-06
140	0.00	0.000	0.025	0.2043	1.3920	0.0002	1.17E-06
141	0.00	0.000	0.024	0.2020	1.3915	0.0002	1.17E-06
142	0.16	0.013	0.029	0.2127	1.3910	0.0002	1.17E-06
143	0.02	0.000	0.037	0.2127	1.3906	0.0002	1.17E-06
144	0.00	0.000	0.020	0.2107	1.3901	0.0002	1.17E-06
145	0.00	0.000	0.017	0.2090	1.3896	0.0002	1.17E-06
146	0.00	0.000	0.018	0.2073	1.3891	0.0002	1.17E-06
147	0.00	0.000	0.016	0.2057	1.3886	0.0002	1.17E-06
148	0.00	0.000	0.018	0.2039	1.3881	0.0002	1.17E-06
149	0.00	0.000	0.017	0.2022	1.3876	0.0002	1.17E-06
150	0.00	0.000	0.017	0.2006	1.3872	0.0002	1.17E-06
151	0.02	0.000	0.021	0.2002	1.3867	0.0002	1.16E-06
152	0.89	0.371	0.028	0.2149	1.3862	0.0002	1.16E-06

153	1.53	0.791	0.369	0.2266	1.3857	0.0002	1.16E-06
154	1.38	0.855	0.378	0.2382	1.3852	0.0002	1.16E-06
155	0.64	0.401	0.387	0.2498	1.3847	0.0002	1.16E-06
156	0.00	0.000	0.394	0.2467	1.3842	0.0002	1.16E-06
157	0.13	0.000	0.196	0.2404	1.3838	0.0002	1.16E-06
158	0.06	0.000	0.162	0.2302	1.3833	0.0002	1.16E-06
159	0.04	0.000	0.161	0.2178	1.3828	0.0002	1.16E-06
160	1.18	0.496	0.144	0.2303	1.3823	0.0002	1.16E-06
161	0.00	0.000	0.421	0.2293	1.3818	0.0002	1.16E-06
162	0.05	0.000	0.240	0.2102	1.3814	0.0002	1.16E-06
163	0.00	0.000	0.093	0.2010	1.3810	0.0002	1.16E-06
164	0.00	0.000	0.032	0.1977	1.3812	0.0002	1.16E-06
165	0.00	0.000	0.005	0.1972	1.3823	0.0002	1.16E-06
166	0.00	0.000	0.002	0.1970	1.3818	0.0002	1.16E-06
167	0.00	0.000	0.000	0.1970	1.3813	0.0002	1.16E-06
168	0.00	0.000	0.000	0.1970	1.3808	0.0002	1.16E-06
169	0.00	0.000	0.000	0.1970	1.3803	0.0002	1.16E-06
170	1.05	0.452	0.044	0.2130	1.3798	0.0002	1.16E-06
171	0.00	0.000	0.428	0.2100	1.3794	0.0002	1.16E-06
172	0.00	0.000	0.107	0.1993	1.3789	0.0002	1.16E-06
173	0.00	0.000	0.023	0.1970	1.3784	0.0002	1.16E-06
174	0.00	0.000	0.000	0.1970	1.3779	0.0002	1.16E-06
175	0.00	0.000	0.000	0.1970	1.3774	0.0002	1.16E-06
176	0.00	0.000	0.000	0.1970	1.3769	0.0002	1.16E-06
177	0.00	0.000	0.000	0.1970	1.3765	0.0002	1.16E-06
178	0.00	0.000	0.000	0.1970	1.3760	0.0002	1.16E-06
179	0.34	0.080	0.037	0.2115	1.3755	0.0002	1.16E-06
180	0.00	0.000	0.095	0.2101	1.3750	0.0002	1.16E-06
181	0.00	0.000	0.023	0.2078	1.3745	0.0002	1.16E-06
182	0.00	0.000	0.020	0.2058	1.3741	0.0002	1.16E-06
183	0.01	0.000	0.023	0.2044	1.3736	0.0002	1.15E-06
184	0.00	0.000	0.018	0.2027	1.3731	0.0002	1.15E-06

185	0.00	0.000	0.018	0.2009	1.3726	0.0002	1.15E-06
186	0.00	0.000	0.016	0.1992	1.3721	0.0002	1.15E-06
187	0.00	0.000	0.015	0.1977	1.3717	0.0002	1.15E-06
188	0.00	0.000	0.007	0.1970	1.3712	0.0002	1.15E-06
189	0.00	0.000	0.000	0.1970	1.3707	0.0002	1.15E-06
190	0.00	0.000	0.000	0.1970	1.3702	0.0002	1.15E-06
191	0.00	0.000	0.000	0.1970	1.3697	0.0002	1.15E-06
192	0.00	0.000	0.000	0.1970	1.3693	0.0002	1.15E-06
193	0.70	0.259	0.025	0.2132	1.3688	0.0002	1.15E-06
194	1.31	0.598	0.379	0.2248	1.3683	0.0002	1.15E-06
195	0.00	0.052	0.247	0.2365	1.3678	0.0002	1.15E-06
196	0.00	0.000	0.140	0.2276	1.3673	0.0002	1.15E-06
197	0.01	0.000	0.124	0.2160	1.3669	0.0002	1.15E-06
198	0.00	0.000	0.147	0.2013	1.3664	0.0002	1.15E-06
199	0.15	0.000	0.074	0.2088	1.3659	0.0002	1.15E-06
200	0.40	0.062	0.155	0.2210	1.3654	0.0002	1.15E-06
201	0.10	0.000	0.109	0.2260	1.3650	0.0002	1.15E-06
202	0.00	0.000	0.138	0.2121	1.3645	0.0002	1.15E-06
203	0.00	0.000	0.122	0.2000	1.3640	0.0002	1.15E-06
204	0.96	0.343	0.159	0.2153	1.3635	0.0002	1.15E-06
205	0.00	0.000	0.356	0.2101	1.3630	0.0002	1.15E-06
206	0.00	0.000	0.107	0.1994	1.3626	0.0002	1.15E-06
207	0.00	0.000	0.024	0.1970	1.3621	0.0002	1.15E-06
208	0.26	0.047	0.081	0.2053	1.3616	0.0002	1.15E-06
209	0.06	0.000	0.084	0.2074	1.3611	0.0002	1.15E-06
210	0.05	0.000	0.041	0.2082	1.3607	0.0002	1.14E-06
211	0.00	0.000	0.026	0.2057	1.3602	0.0002	1.14E-06
212	0.00	0.000	0.028	0.2029	1.3597	0.0002	1.14E-06
213	0.00	0.000	0.025	0.2004	1.3592	0.0002	1.14E-06
214	0.02	0.000	0.033	0.1995	1.3587	0.0002	1.14E-06
215	0.32	0.070	0.043	0.2130	1.3583	0.0002	1.14E-06
216	0.12	0.000	0.190	0.2127	1.3578	0.0002	1.14E-06

217	0.00	0.000	0.016	0.2111	1.3573	0.0002	1.14E-06
218	0.00	0.000	0.021	0.2090	1.3568	0.0002	1.14E-06
219	0.00	0.000	0.024	0.2066	1.3564	0.0002	1.14E-06
220	0.00	0.000	0.024	0.2042	1.3559	0.0002	1.14E-06
221	0.30	0.064	0.032	0.2188	1.3554	0.0002	1.14E-06
222	0.00	0.000	0.207	0.2045	1.3549	0.0002	1.14E-06
223	0.00	0.000	0.020	0.2025	1.3545	0.0002	1.14E-06
224	0.00	0.000	0.028	0.1998	1.3540	0.0002	1.14E-06
225	0.00	0.000	0.023	0.1975	1.3535	0.0002	1.14E-06
226	0.00	0.000	0.004	0.1970	1.3531	0.0002	1.14E-06
227	0.00	0.000	0.000	0.1970	1.3526	0.0002	1.14E-06
228	0.00	0.000	0.000	0.1970	1.3521	0.0002	1.14E-06
229	0.11	0.000	0.011	0.2074	1.3517	0.0002	1.14E-06
230	0.00	0.000	0.010	0.2064	1.3512	0.0002	1.14E-06
231	0.17	0.013	0.021	0.2187	1.3507	0.0002	1.14E-06
232	0.01	0.000	0.027	0.2181	1.3502	0.0002	1.14E-06
233	0.00	0.000	0.016	0.2165	1.3498	0.0002	1.14E-06
234	0.00	0.000	0.017	0.2148	1.3493	0.0002	1.14E-06
235	0.00	0.000	0.015	0.2134	1.3488	0.0002	1.14E-06
236	0.00	0.000	0.016	0.2119	1.3483	0.0002	1.14E-06
237	0.35	0.086	0.030	0.2262	1.3479	0.0002	1.13E-06
238	0.52	0.121	0.262	0.2379	1.3474	0.0002	1.13E-06
239	0.24	0.033	0.251	0.2410	1.3469	0.0002	1.13E-06
240	0.02	0.000	0.090	0.2369	1.3465	0.0002	1.13E-06
241	0.00	0.000	0.068	0.2303	1.3460	0.0002	1.13E-06
242	0.00	0.000	0.139	0.2164	1.3455	0.0002	1.13E-06
243	0.00	0.000	0.090	0.2074	1.3450	0.0002	1.13E-06
244	0.00	0.000	0.083	0.1991	1.3446	0.0002	1.13E-06
245	0.00	0.000	0.017	0.1974	1.3441	0.0002	1.13E-06
246	0.07	0.000	0.020	0.2023	1.3436	0.0002	1.13E-06
247	0.00	0.000	0.039	0.1985	1.3432	0.0002	1.13E-06
248	0.00	0.000	0.011	0.1974	1.3427	0.0002	1.13E-06

249	0.00	0.000	0.004	0.1971	1.3422	0.0002	1.13E-06
250	0.00	0.000	0.000	0.1970	1.3417	0.0002	1.13E-06
251	0.00	0.000	0.000	0.1970	1.3413	0.0002	1.13E-06
252	0.00	0.000	0.000	0.1970	1.3408	0.0002	1.13E-06
253	0.00	0.000	0.000	0.1970	1.3403	0.0002	1.13E-06
254	0.00	0.000	0.000	0.1970	1.3399	0.0002	1.13E-06
255	0.00	0.000	0.000	0.1970	1.3394	0.0002	1.13E-06
256	0.00	0.000	0.000	0.1970	1.3389	0.0002	1.13E-06
257	0.00	0.000	0.000	0.1970	1.3385	0.0002	1.13E-06
258	0.00	0.000	0.000	0.1970	1.3380	0.0002	1.13E-06
259	0.00	0.000	0.000	0.1970	1.3375	0.0002	1.13E-06
260	0.00	0.000	0.000	0.1970	1.3370	0.0002	1.13E-06
261	0.00	0.000	0.000	0.1970	1.3366	0.0002	1.13E-06
262	0.01	0.000	0.007	0.1970	1.3361	0.0002	1.13E-06
263	0.00	0.000	0.000	0.1970	1.3356	0.0002	1.13E-06
264	0.00	0.000	0.000	0.1970	1.3352	0.0002	1.13E-06
265	0.51	0.159	0.027	0.2132	1.3347	0.0002	1.12E-06
266	0.14	0.041	0.098	0.2248	1.3342	0.0002	1.12E-06
267	0.00	0.000	0.057	0.2233	1.3338	0.0002	1.12E-06
268	0.00	0.000	0.013	0.2220	1.3333	0.0002	1.12E-06
269	0.00	0.000	0.013	0.2207	1.3329	0.0002	1.12E-06
270	0.00	0.000	0.014	0.2193	1.3324	0.0002	1.12E-06
271	0.06	0.000	0.022	0.2233	1.3319	0.0002	1.12E-06
272	0.00	0.000	0.017	0.2217	1.3315	0.0002	1.12E-06
273	0.00	0.000	0.013	0.2204	1.3310	0.0002	1.12E-06
274	0.00	0.000	0.011	0.2193	1.3305	0.0002	1.12E-06
275	0.00	0.000	0.012	0.2181	1.3301	0.0002	1.12E-06
276	0.00	0.000	0.011	0.2171	1.3296	0.0002	1.12E-06
277	0.00	0.000	0.011	0.2160	1.3291	0.0002	1.12E-06
278	0.33	0.083	0.024	0.2306	1.3287	0.0002	1.12E-06
279	0.24	0.067	0.074	0.2422	1.3282	0.0002	1.12E-06
280	0.00	0.000	0.081	0.2408	1.3277	0.0002	1.12E-06

281		0.00	0.000	0.058	0.2350	1.3273	0.0002	1.12E-06
282		0.00	0.000	0.117	0.2233	1.3268	0.0002	1.12E-06
283		0.00	0.000	0.059	0.2173	1.3263	0.0002	1.12E-06
284		0.00	0.000	0.054	0.2119	1.3259	0.0002	1.12E-06
285		0.00	0.000	0.096	0.2023	1.3254	0.0002	1.12E-06
286		0.00	0.000	0.049	0.1975	1.3249	0.0002	1.12E-06
287	*	0.00	0.000	0.003	0.1972	1.3245	0.0002	1.12E-06
288		0.00	0.000	0.002	0.1970	1.3240	0.0002	1.12E-06
289		0.00	0.000	0.000	0.1970	1.3236	0.0002	1.12E-06
290		0.00	0.000	0.000	0.1970	1.3231	0.0002	1.12E-06
291		3.66	2.179	0.040	0.2132	1.3226	0.0001	1.12E-06
292		0.66	0.845	0.144	0.2249	1.3222	0.0001	1.12E-06
293		0.00	0.281	0.154	0.2365	1.3217	0.0001	1.11E-06
294		0.00	0.029	0.107	0.2481	1.3212	0.0001	1.11E-06
295		0.00	0.000	0.103	0.2407	1.3208	0.0001	1.11E-06
296		0.00	0.000	0.061	0.2346	1.3203	0.0001	1.11E-06
297	*	0.00	0.000	0.000	0.2346	1.3198	0.0001	1.11E-06
298	*	0.00	0.000	0.000	0.2346	1.3194	0.0001	1.11E-06
299	*	0.00	0.000	0.000	0.2346	1.3189	0.0001	1.11E-06
300	*	0.00	0.000	0.000	0.2347	1.3185	0.0001	1.11E-06
301		0.04	0.000	0.072	0.2310	1.3180	0.0001	1.11E-06
302		0.00	0.000	0.090	0.2221	1.3175	0.0001	1.11E-06
303		0.00	0.000	0.055	0.2166	1.3171	0.0001	1.11E-06
304		0.05	0.000	0.145	0.2069	1.3166	0.0001	1.11E-06
305		0.08	0.000	0.078	0.2068	1.3162	0.0001	1.11E-06
306		0.32	0.051	0.088	0.2198	1.3157	0.0001	1.11E-06
307		0.48	0.148	0.119	0.2314	1.3152	0.0001	1.11E-06
308		0.01	0.000	0.088	0.2383	1.3148	0.0001	1.11E-06
309		0.00	0.000	0.066	0.2317	1.3148	0.0001	1.11E-06
310	*	0.00	0.000	0.048	0.2269	1.3146	0.0001	1.11E-06
311	*	0.00	0.000	0.000	0.2269	1.3141	0.0001	1.11E-06
312	*	0.00	0.000	0.000	0.2269	1.3137	0.0001	1.11E-06

313	*		0.11	0.000	0.027	0.2289	1.3132	0.0001	1.11E-06
314	*		0.00	0.000	0.034	0.2309	1.3128	0.0001	1.11E-06
315	*		0.00	0.000	0.007	0.2309	1.3123	0.0001	1.11E-06
316	*		0.00	0.000	0.000	0.2309	1.3118	0.0001	1.11E-06
317	*		0.09	0.000	0.031	0.2329	1.3114	0.0001	1.11E-06
318	*		0.00	0.000	0.017	0.2349	1.3109	0.0001	1.11E-06
319			0.02	0.000	0.060	0.2313	1.3105	0.0001	1.11E-06
320	*		0.02	0.000	0.015	0.2313	1.3100	0.0001	1.11E-06
321	*	*	0.00	0.000	0.000	0.2313	1.3095	0.0001	1.11E-06
322	*	*	0.00	0.000	0.000	0.2313	1.3091	0.0001	1.10E-06
323		*	0.00	0.000	0.000	0.2313	1.3086	0.0001	1.10E-06
324	*	*	0.00	0.000	0.000	0.2313	1.3082	0.0001	1.10E-06
325	*	*	0.72	0.000	0.041	0.2313	1.3077	0.0001	1.10E-06
326		*	0.00	0.407	0.033	0.2331	1.3072	0.0001	1.10E-06
327		*	0.00	0.000	0.142	0.2410	1.3068	0.0001	1.10E-06
328		*	0.00	0.000	0.000	0.2411	1.3063	0.0001	1.10E-06
329	*	*	0.00	0.000	0.003	0.2411	1.3059	0.0001	1.10E-06
330	*	*	0.05	0.000	0.021	0.2411	1.3054	0.0001	1.10E-06
331	*	*	0.07	0.000	0.000	0.2411	1.3050	0.0001	1.10E-06
332		*	0.00	0.004	0.068	0.2439	1.3045	0.0001	1.10E-06
333	*	*	0.00	0.000	0.000	0.2439	1.3040	0.0001	1.10E-06
334		*	0.00	0.000	0.000	0.2439	1.3036	0.0001	1.10E-06
335	*	*	0.00	0.000	0.000	0.2439	1.3031	0.0001	1.10E-06
336		*	0.00	0.000	0.000	0.2439	1.3027	0.0001	1.10E-06
337		*	0.00	0.000	0.000	0.2440	1.3022	0.0001	1.10E-06
338		*	0.00	0.000	0.000	0.2440	1.3018	0.0001	1.10E-06
339			0.00	0.000	0.058	0.2382	1.3013	0.0001	1.10E-06
340			0.00	0.000	0.102	0.2280	1.3008	0.0001	1.10E-06
341			0.00	0.000	0.071	0.2209	1.3004	0.0001	1.10E-06
342			0.00	0.000	0.049	0.2161	1.3000	0.0001	1.10E-06
343	*		0.00	0.000	0.000	0.2161	1.2995	0.0001	1.10E-06
344	*		0.00	0.000	0.000	0.2161	1.2991	0.0001	1.10E-06

345	*	0.00	0.000	0.039	0.2122	1.2986	0.0001	1.10E-06
346	*	0.10	0.000	0.025	0.2142	1.2982	0.0001	1.10E-06
347	*	0.12	0.000	0.000	0.2162	1.2977	0.0001	1.10E-06
348	*	0.69	0.000	0.022	0.2182	1.2973	0.0001	1.10E-06
349		0.17	0.000	0.000	0.2307	1.2968	0.0001	1.10E-06
350		0.02	0.405	0.000	0.2425	1.2963	0.0001	1.10E-06
351		0.00	0.052	0.128	0.2542	1.2959	0.0001	1.09E-06
352		0.01	0.000	0.129	0.2474	1.2954	0.0001	1.09E-06
353		0.06	0.000	0.049	0.2484	1.2950	0.0001	1.09E-06
354		0.07	0.000	0.048	0.2511	1.2945	0.0001	1.09E-06
355		0.00	0.000	0.083	0.2428	1.2941	0.0001	1.09E-06
356		0.00	0.000	0.064	0.2365	1.2936	0.0001	1.09E-06
357		0.00	0.000	0.068	0.2297	1.2932	0.0001	1.09E-06
358		0.08	0.000	0.115	0.2267	1.2927	0.0001	1.09E-06
359		0.00	0.000	0.079	0.2189	1.2923	0.0001	1.09E-06
360	*	0.01	0.000	0.050	0.2151	1.2918	0.0001	1.09E-06
361		0.19	0.025	0.057	0.2230	1.2914	0.0001	1.09E-06
362		0.00	0.000	0.087	0.2168	1.2909	0.0001	1.09E-06
363		0.00	0.000	0.056	0.2112	1.2905	0.0001	1.09E-06
364		0.00	0.000	0.074	0.2039	1.2900	0.0001	1.09E-06
365	*	0.00	0.000	0.036	0.2002	1.2896	0.0001	1.09E-06

* = Frozen (air or soil)

Annual Totals for Year 8			
	inches	cubic feet	percent
Precipitation	38.77	140,734.9	100.00
Runoff	16.296	59,153.7	42.03
Evapotranspiration	22.645	82,202.9	58.41
Recirculation into Layer 1	0.0570	206.8	0.15
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0570	206.8	0.15
Percolation/Leakage through Layer 5	0.000422	1.5336	0.00
Average Head on Top of Layer 4	1.3729	---	---
Change in Water Storage	-0.1717	-623.1	-0.44
Soil Water at Start of Year	293.5662	1,065,645.3	757.20
Soil Water at End of Year	293.3945	1,065,022.2	756.76
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0570	-206.9	-0.15

Daily Output for Year 9

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.032	0.1971	1.2886	0.0001	1.09E-06
2			0.00	0.000	0.001	0.1971	1.2882	0.0001	1.09E-06
3			0.00	0.000	0.001	0.1970	1.2878	0.0001	1.09E-06
4			0.00	0.000	0.001	0.1970	1.2873	0.0001	1.09E-06
5			1.07	0.453	0.053	0.2133	1.2869	0.0001	1.09E-06
6			0.00	0.101	0.079	0.2250	1.2864	0.0001	1.09E-06
7	*		0.00	0.000	0.035	0.2250	1.2860	0.0001	1.09E-06
8	*		0.00	0.000	0.022	0.2250	1.2855	0.0001	1.09E-06
9	*		0.00	0.000	0.041	0.2256	1.2851	0.0001	1.09E-06
10	*		0.00	0.000	0.004	0.2256	1.2846	0.0001	1.09E-06
11	*		0.00	0.000	0.000	0.2257	1.2842	0.0001	1.09E-06
12			0.00	0.000	0.065	0.2192	1.2837	0.0001	1.09E-06
13			0.00	0.000	0.074	0.2118	1.2833	0.0001	1.08E-06
14			0.00	0.000	0.090	0.2028	1.2829	0.0001	1.08E-06
15			0.00	0.000	0.047	0.1981	1.2824	0.0001	1.08E-06
16			0.00	0.000	0.006	0.1976	1.2820	0.0001	1.08E-06
17	*		0.00	0.000	0.003	0.1973	1.2815	0.0001	1.08E-06
18			0.23	0.042	0.036	0.2084	1.2811	0.0001	1.08E-06
19			0.11	0.000	0.089	0.2144	1.2806	0.0001	1.08E-06
20			0.01	0.000	0.036	0.2114	1.2802	0.0001	1.08E-06
21			0.00	0.000	0.056	0.2059	1.2797	0.0001	1.08E-06
22			0.00	0.000	0.066	0.1993	1.2793	0.0001	1.08E-06
23			0.00	0.000	0.021	0.1972	1.2788	0.0001	1.08E-06
24			0.00	0.000	0.002	0.1970	1.2784	0.0001	1.08E-06

25		0.00	0.000	0.000	0.1970	1.2779	0.0001	1.08E-06
26	*	0.00	0.000	0.000	0.1970	1.2775	0.0001	1.08E-06
27	*	0.00	0.000	0.000	0.1970	1.2770	0.0001	1.08E-06
28	*	0.00	0.000	0.000	0.1970	1.2766	0.0001	1.08E-06
29	*	0.00	0.000	0.000	0.1970	1.2761	0.0001	1.08E-06
30	*	0.00	0.000	0.000	0.1970	1.2757	0.0001	1.08E-06
31	*	0.00	0.000	0.000	0.1971	1.2752	0.0001	1.08E-06
32	*	0.00	0.000	0.000	0.1971	1.2748	0.0001	1.08E-06
33		0.00	0.000	0.001	0.1970	1.2744	0.0001	1.08E-06
34		0.00	0.000	0.000	0.1970	1.2739	0.0001	1.08E-06
35		0.00	0.000	0.000	0.1970	1.2735	0.0001	1.08E-06
36	*	0.03	0.000	0.034	0.1970	1.2730	0.0001	1.08E-06
37	*	0.18	0.000	0.050	0.1990	1.2726	0.0001	1.08E-06
38		0.00	0.000	0.046	0.2060	1.2721	0.0001	1.08E-06
39		0.14	0.000	0.019	0.2177	1.2717	0.0001	1.08E-06
40	*	0.11	0.000	0.067	0.2197	1.2712	0.0001	1.08E-06
41		0.00	0.000	0.042	0.2181	1.2708	0.0001	1.08E-06
42	*	0.00	0.000	0.018	0.2167	1.2703	0.0001	1.07E-06
43		0.12	0.000	0.022	0.2265	1.2699	0.0001	1.07E-06
44		0.29	0.067	0.028	0.2396	1.2694	0.0001	1.07E-06
45		0.17	0.023	0.087	0.2502	1.2690	0.0001	1.07E-06
46		0.43	0.128	0.099	0.2619	1.2686	0.0001	1.07E-06
47		0.00	0.000	0.157	0.2567	1.2681	0.0001	1.07E-06
48		0.00	0.000	0.067	0.2501	1.2677	0.0001	1.07E-06
49	*	0.00	0.000	0.000	0.2501	1.2672	0.0001	1.07E-06
50		0.00	0.000	0.069	0.2432	1.2668	0.0001	1.07E-06
51		0.00	0.000	0.142	0.2290	1.2663	0.0001	1.07E-06
52		0.00	0.000	0.147	0.2143	1.2659	0.0001	1.07E-06
53		0.00	0.000	0.057	0.2090	1.2655	0.0001	1.07E-06
54	*	0.00	0.000	0.000	0.2091	1.2650	0.0001	1.07E-06
55	*	0.00	0.000	0.000	0.2091	1.2646	0.0001	1.07E-06
56		0.00	0.000	0.076	0.2015	1.2641	0.0001	1.07E-06

57		0.00	0.000	0.026	0.1990	1.2637	0.0001	1.07E-06
58		0.00	0.000	0.011	0.1979	1.2632	0.0001	1.07E-06
59		0.00	0.000	0.009	0.1970	1.2628	0.0001	1.07E-06
60		0.00	0.000	0.000	0.1970	1.2624	0.0001	1.07E-06
61		0.00	0.000	0.000	0.1970	1.2619	0.0001	1.07E-06
62		0.00	0.000	0.000	0.1970	1.2615	0.0001	1.07E-06
63		0.00	0.000	0.000	0.1970	1.2610	0.0001	1.07E-06
64		0.71	0.262	0.032	0.2133	1.2606	0.0001	1.07E-06
65		0.00	0.000	0.246	0.2140	1.2601	0.0001	1.07E-06
66		0.00	0.000	0.120	0.2023	1.2597	0.0001	1.07E-06
67		0.00	0.000	0.042	0.1981	1.2593	0.0001	1.07E-06
68		0.00	0.000	0.011	0.1970	1.2588	0.0001	1.07E-06
69		0.00	0.000	0.000	0.1970	1.2584	0.0001	1.07E-06
70		0.00	0.000	0.000	0.1970	1.2579	0.0001	1.07E-06
71		0.72	0.262	0.046	0.2133	1.2575	0.0001	1.06E-06
72		0.00	0.000	0.175	0.2210	1.2571	0.0001	1.06E-06
73		0.00	0.000	0.109	0.2101	1.2566	0.0001	1.06E-06
74		0.00	0.000	0.105	0.1996	1.2562	0.0001	1.06E-06
75	*	0.00	0.000	0.025	0.1971	1.2557	0.0001	1.06E-06
76		0.00	0.000	0.001	0.1971	1.2553	0.0001	1.06E-06
77		0.11	0.000	0.012	0.2064	1.2549	0.0001	1.06E-06
78		0.03	0.000	0.024	0.2071	1.2544	0.0001	1.06E-06
79	*	1.98	0.000	0.000	0.2091	1.2540	0.0001	1.06E-06
80	*	0.00	0.000	0.024	0.2111	1.2535	0.0001	1.06E-06
81		0.00	0.770	0.000	0.2239	1.2531	0.0001	1.06E-06
82		0.00	0.494	0.014	0.2355	1.2527	0.0001	1.06E-06
83		0.09	0.051	0.263	0.2471	1.2522	0.0001	1.06E-06
84		0.01	0.000	0.181	0.2351	1.2518	0.0001	1.06E-06
85		0.07	0.000	0.254	0.2169	1.2513	0.0001	1.06E-06
86		0.00	0.000	0.166	0.2003	1.2509	0.0001	1.06E-06
87		0.00	0.000	0.023	0.1980	1.2505	0.0001	1.06E-06
88		0.00	0.000	0.008	0.1971	1.2513	0.0001	1.06E-06

89		0.00	0.000	0.001	0.1970	1.2516	0.0001	1.06E-06
90		0.00	0.000	0.000	0.1970	1.2512	0.0001	1.06E-06
91		0.00	0.000	0.000	0.1970	1.2507	0.0001	1.06E-06
92		0.00	0.000	0.000	0.1970	1.2503	0.0001	1.06E-06
93		0.11	0.000	0.011	0.2072	1.2498	0.0001	1.06E-06
94		0.00	0.000	0.012	0.2060	1.2494	0.0001	1.06E-06
95	*	0.00	0.000	0.014	0.2046	1.2490	0.0001	1.06E-06
96		0.00	0.000	0.016	0.2030	1.2485	0.0001	1.06E-06
97		0.00	0.000	0.019	0.2016	1.2481	0.0001	1.06E-06
98		0.00	0.000	0.015	0.2001	1.2477	0.0001	1.06E-06
99		0.00	0.000	0.014	0.1987	1.2472	0.0001	1.06E-06
100		0.12	0.000	0.020	0.2086	1.2468	0.0001	1.06E-06
101		0.64	0.243	0.028	0.2216	1.2464	0.0001	1.06E-06
102		0.00	0.000	0.265	0.2188	1.2459	0.0001	1.06E-06
103		0.00	0.000	0.121	0.2067	1.2455	0.0001	1.06E-06
104		0.06	0.000	0.088	0.2039	1.2450	0.0001	1.06E-06
105		0.00	0.000	0.045	0.1994	1.2446	0.0001	1.05E-06
106		0.00	0.000	0.012	0.1982	1.2442	0.0001	1.05E-06
107		1.54	0.751	0.047	0.2139	1.2437	0.0001	1.05E-06
108		0.01	0.009	0.463	0.2255	1.2433	0.0001	1.05E-06
109		0.53	0.071	0.296	0.2370	1.2429	0.0001	1.05E-06
110		0.00	0.000	0.192	0.2235	1.2424	0.0001	1.05E-06
111		0.00	0.000	0.095	0.2140	1.2420	0.0001	1.05E-06
112		0.02	0.000	0.063	0.2098	1.2416	0.0001	1.05E-06
113	*	0.00	0.000	0.000	0.2098	1.2411	0.0001	1.05E-06
114	*	0.00	0.000	0.087	0.2011	1.2407	0.0001	1.05E-06
115		0.00	0.000	0.031	0.1981	1.2403	0.0001	1.05E-06
116		0.00	0.000	0.008	0.1973	1.2401	0.0001	1.05E-06
117		0.00	0.000	0.003	0.1970	1.2397	0.0001	1.05E-06
118		0.00	0.000	0.000	0.1970	1.2393	0.0001	1.05E-06
119		0.13	0.000	0.013	0.2090	1.2388	0.0001	1.05E-06
120		0.00	0.000	0.016	0.2074	1.2384	0.0001	1.05E-06

121	0.00	0.000	0.019	0.2055	1.2380	0.0001	1.05E-06
122	0.00	0.000	0.021	0.2035	1.2375	0.0001	1.05E-06
123	0.00	0.000	0.019	0.2015	1.2371	0.0001	1.05E-06
124	0.00	0.000	0.018	0.1998	1.2367	0.0001	1.05E-06
125	0.00	0.000	0.017	0.1981	1.2362	0.0001	1.05E-06
126	0.00	0.000	0.008	0.1973	1.2358	0.0001	1.05E-06
127	0.00	0.000	0.003	0.1970	1.2354	0.0001	1.05E-06
128	0.00	0.000	0.000	0.1970	1.2349	0.0001	1.05E-06
129	0.00	0.000	0.000	0.1970	1.2345	0.0001	1.05E-06
130	0.00	0.000	0.000	0.1970	1.2341	0.0001	1.05E-06
131	0.22	0.039	0.017	0.2098	1.2336	0.0001	1.05E-06
132	0.00	0.000	0.046	0.2090	1.2332	0.0001	1.05E-06
133	0.00	0.000	0.012	0.2078	1.2328	0.0001	1.05E-06
134	0.04	0.000	0.021	0.2094	1.2323	0.0001	1.05E-06
135	0.04	0.000	0.020	0.2113	1.2319	0.0001	1.05E-06
136	0.24	0.041	0.025	0.2247	1.2315	0.0001	1.04E-06
137	0.92	0.435	0.067	0.2362	1.2310	0.0001	1.04E-06
138	0.00	0.000	0.283	0.2425	1.2306	0.0001	1.04E-06
139	0.00	0.000	0.156	0.2268	1.2302	0.0001	1.04E-06
140	0.00	0.000	0.269	0.1999	1.2297	0.0001	1.04E-06
141	0.00	0.000	0.022	0.1977	1.2293	0.0001	1.04E-06
142	0.00	0.000	0.004	0.1974	1.2289	0.0001	1.04E-06
143	0.00	0.000	0.004	0.1970	1.2285	0.0001	1.04E-06
144	0.00	0.000	0.000	0.1970	1.2280	0.0001	1.04E-06
145	0.00	0.000	0.000	0.1970	1.2276	0.0001	1.04E-06
146	0.00	0.000	0.000	0.1970	1.2272	0.0001	1.04E-06
147	0.00	0.000	0.000	0.1970	1.2267	0.0001	1.04E-06
148	0.00	0.000	0.000	0.1970	1.2263	0.0001	1.04E-06
149	0.02	0.000	0.010	0.1977	1.2259	0.0001	1.04E-06
150	0.00	0.000	0.002	0.1975	1.2254	0.0001	1.04E-06
151	0.58	0.194	0.032	0.2135	1.2250	0.0001	1.04E-06
152	0.00	0.000	0.202	0.2125	1.2246	0.0001	1.04E-06

153	0.02	0.000	0.024	0.2120	1.2242	0.0001	1.04E-06
154	0.00	0.000	0.016	0.2104	1.2237	0.0001	1.04E-06
155	0.00	0.000	0.017	0.2087	1.2233	0.0001	1.04E-06
156	0.10	0.000	0.023	0.2168	1.2229	0.0001	1.04E-06
157	0.00	0.000	0.011	0.2157	1.2224	0.0001	1.04E-06
158	1.47	0.746	0.028	0.2288	1.2220	0.0001	1.04E-06
159	0.00	0.117	0.209	0.2404	1.2216	0.0001	1.04E-06
160	0.88	0.397	0.194	0.2521	1.2212	0.0001	1.04E-06
161	0.00	0.000	0.279	0.2536	1.2207	0.0001	1.04E-06
162	0.00	0.000	0.094	0.2443	1.2203	0.0001	1.04E-06
163	0.00	0.000	0.095	0.2348	1.2199	0.0001	1.04E-06
164	0.10	0.000	0.116	0.2329	1.2194	0.0001	1.04E-06
165	0.00	0.000	0.261	0.2069	1.2190	0.0001	1.04E-06
166	0.00	0.000	0.084	0.1986	1.2186	0.0001	1.03E-06
167	0.02	0.000	0.034	0.1977	1.2182	0.0001	1.03E-06
168	0.01	0.000	0.014	0.1975	1.2195	0.0001	1.04E-06
169	0.00	0.000	0.003	0.1972	1.2202	0.0001	1.04E-06
170	0.02	0.000	0.013	0.1976	1.2197	0.0001	1.04E-06
171	0.00	0.000	0.004	0.1973	1.2193	0.0001	1.04E-06
172	0.00	0.000	0.002	0.1971	1.2189	0.0001	1.03E-06
173	0.00	0.000	0.001	0.1970	1.2185	0.0001	1.03E-06
174	0.00	0.000	0.000	0.1970	1.2180	0.0001	1.03E-06
175	0.00	0.000	0.000	0.1970	1.2176	0.0001	1.03E-06
176	0.00	0.000	0.000	0.1970	1.2172	0.0001	1.03E-06
177	0.90	0.369	0.033	0.2131	1.2167	0.0001	1.03E-06
178	0.00	0.000	0.250	0.2220	1.2163	0.0001	1.03E-06
179	0.00	0.000	0.096	0.2124	1.2159	0.0001	1.03E-06
180	0.16	0.006	0.144	0.2125	1.2155	0.0001	1.03E-06
181	0.13	0.000	0.189	0.2067	1.2150	0.0001	1.03E-06
182	0.08	0.000	0.080	0.2072	1.2146	0.0001	1.03E-06
183	0.04	0.000	0.038	0.2073	1.2142	0.0001	1.03E-06
184	0.09	0.000	0.035	0.2130	1.2138	0.0001	1.03E-06

185	0.00	0.000	0.020	0.2110	1.2133	0.0001	1.03E-06
186	0.00	0.000	0.026	0.2085	1.2129	0.0001	1.03E-06
187	0.16	0.012	0.031	0.2191	1.2125	0.0001	1.03E-06
188	0.00	0.000	0.030	0.2173	1.2121	0.0001	1.03E-06
189	0.00	0.000	0.021	0.2152	1.2116	0.0001	1.03E-06
190	0.22	0.035	0.027	0.2272	1.2112	0.0001	1.03E-06
191	0.00	0.000	0.200	0.2111	1.2108	0.0001	1.03E-06
192	0.00	0.000	0.023	0.2088	1.2104	0.0001	1.03E-06
193	0.47	0.140	0.034	0.2249	1.2099	0.0001	1.03E-06
194	0.00	0.000	0.285	0.2104	1.2095	0.0001	1.03E-06
195	0.00	0.000	0.022	0.2082	1.2091	0.0001	1.03E-06
196	0.04	0.000	0.030	0.2090	1.2087	0.0001	1.03E-06
197	0.37	0.105	0.033	0.2222	1.2082	0.0001	1.03E-06
198	0.27	0.028	0.318	0.2221	1.2078	0.0001	1.03E-06
199	0.00	0.000	0.189	0.2061	1.2074	0.0001	1.03E-06
200	0.00	0.000	0.067	0.1994	1.2070	0.0001	1.03E-06
201	0.01	0.000	0.032	0.1971	1.2066	0.0001	1.03E-06
202	0.00	0.000	0.001	0.1970	1.2061	0.0001	1.02E-06
203	0.00	0.000	0.000	0.1970	1.2057	0.0001	1.02E-06
204	0.04	0.000	0.013	0.1998	1.2053	0.0001	1.02E-06
205	0.00	0.000	0.003	0.1995	1.2049	0.0001	1.02E-06
206	0.00	0.000	0.008	0.1987	1.2044	0.0001	1.02E-06
207	0.07	0.000	0.016	0.2043	1.2040	0.0001	1.02E-06
208	0.13	0.000	0.024	0.2148	1.2036	0.0001	1.02E-06
209	0.03	0.000	0.022	0.2152	1.2032	0.0001	1.02E-06
210	0.00	0.000	0.020	0.2132	1.2028	0.0001	1.02E-06
211	0.00	0.000	0.021	0.2111	1.2023	0.0001	1.02E-06
212	0.00	0.000	0.020	0.2091	1.2019	0.0001	1.02E-06
213	0.73	0.285	0.035	0.2229	1.2015	0.0001	1.02E-06
214	0.47	0.129	0.378	0.2346	1.2011	0.0001	1.02E-06
215	0.13	0.001	0.160	0.2438	1.2007	0.0001	1.02E-06
216	0.83	0.281	0.263	0.2550	1.2002	0.0001	1.02E-06

217	0.00	0.000	0.323	0.2406	1.1998	0.0001	1.02E-06
218	0.03	0.000	0.205	0.2231	1.1994	0.0001	1.02E-06
219	0.00	0.000	0.222	0.2009	1.1990	0.0001	1.02E-06
220	0.00	0.000	0.029	0.1980	1.1986	0.0001	1.02E-06
221	0.00	0.000	0.009	0.1971	1.1981	0.0001	1.02E-06
222	0.00	0.000	0.001	0.1970	1.1977	0.0001	1.02E-06
223	0.14	0.000	0.019	0.2090	1.1973	0.0001	1.02E-06
224	0.43	0.133	0.046	0.2211	1.1969	0.0001	1.02E-06
225	0.00	0.000	0.229	0.2119	1.1965	0.0001	1.02E-06
226	0.00	0.000	0.133	0.1986	1.1960	0.0001	1.02E-06
227	0.00	0.000	0.016	0.1970	1.1956	0.0001	1.02E-06
228	0.00	0.000	0.000	0.1970	1.1952	0.0001	1.02E-06
229	0.00	0.000	0.000	0.1970	1.1948	0.0001	1.02E-06
230	0.00	0.000	0.000	0.1970	1.1944	0.0001	1.02E-06
231	0.00	0.000	0.000	0.1970	1.1939	0.0001	1.02E-06
232	0.00	0.000	0.000	0.1970	1.1935	0.0001	1.02E-06
233	0.01	0.000	0.010	0.1974	1.1931	0.0001	1.01E-06
234	0.00	0.000	0.002	0.1972	1.1927	0.0001	1.01E-06
235	0.00	0.000	0.001	0.1971	1.1923	0.0001	1.01E-06
236	0.00	0.000	0.001	0.1970	1.1919	0.0001	1.01E-06
237	0.00	0.000	0.000	0.1970	1.1914	0.0001	1.01E-06
238	0.00	0.000	0.000	0.1970	1.1910	0.0001	1.01E-06
239	0.10	0.000	0.012	0.2063	1.1906	0.0001	1.01E-06
240	0.00	0.000	0.010	0.2053	1.1902	0.0001	1.01E-06
241	0.00	0.000	0.017	0.2039	1.1898	0.0001	1.01E-06
242	0.01	0.000	0.023	0.2024	1.1894	0.0001	1.01E-06
243	0.00	0.000	0.015	0.2009	1.1889	0.0001	1.01E-06
244	0.00	0.000	0.019	0.1990	1.1885	0.0001	1.01E-06
245	0.14	0.003	0.027	0.2100	1.1881	0.0001	1.01E-06
246	0.00	0.000	0.014	0.2088	1.1877	0.0001	1.01E-06
247	0.00	0.000	0.016	0.2072	1.1873	0.0001	1.01E-06
248	0.44	0.136	0.032	0.2213	1.1869	0.0001	1.01E-06

249	0.22	0.040	0.165	0.2326	1.1864	0.0001	1.01E-06
250	0.10	0.000	0.067	0.2396	1.1860	0.0001	1.01E-06
251	0.42	0.137	0.031	0.2521	1.1856	0.0001	1.01E-06
252	0.11	0.000	0.180	0.2577	1.1852	0.0001	1.01E-06
253	0.00	0.000	0.232	0.2345	1.1848	0.0001	1.01E-06
254	0.00	0.000	0.298	0.2048	1.1844	0.0001	1.01E-06
255	0.89	0.304	0.156	0.2206	1.1840	0.0001	1.01E-06
256	0.00	0.009	0.140	0.2322	1.1835	0.0001	1.01E-06
257	0.00	0.000	0.205	0.2126	1.1831	0.0001	1.01E-06
258	0.00	0.000	0.126	0.2000	1.1827	0.0001	1.01E-06
259	0.00	0.000	0.030	0.1970	1.1823	0.0001	1.01E-06
260	0.00	0.000	0.000	0.1970	1.1819	0.0001	1.01E-06
261	0.00	0.000	0.000	0.1970	1.1815	0.0001	1.01E-06
262	0.00	0.000	0.000	0.1970	1.1811	0.0001	1.01E-06
263	0.21	0.031	0.027	0.2090	1.1806	0.0001	1.01E-06
264	0.00	0.000	0.046	0.2075	1.1802	0.0001	1.00E-06
265	0.00	0.000	0.021	0.2054	1.1798	0.0001	1.00E-06
266	0.00	0.000	0.020	0.2034	1.1794	0.0001	1.00E-06
267	0.00	0.000	0.018	0.2016	1.1790	0.0001	1.00E-06
268	0.16	0.011	0.027	0.2129	1.1786	0.0001	1.00E-06
269	0.50	0.174	0.045	0.2244	1.1782	0.0001	1.00E-06
270	1.14	0.532	0.280	0.2360	1.1777	0.0001	1.00E-06
271	0.27	0.164	0.215	0.2476	1.1773	0.0001	1.00E-06
272	0.11	0.000	0.306	0.2445	1.1769	0.0001	1.00E-06
273	0.00	0.000	0.099	0.2346	1.1765	0.0001	1.00E-06
274	0.00	0.000	0.205	0.2142	1.1761	0.0001	1.00E-06
275	0.00	0.000	0.112	0.2030	1.1757	0.0001	1.00E-06
276	0.00	0.000	0.057	0.1973	1.1753	0.0001	1.00E-06
277	0.00	0.000	0.002	0.1971	1.1749	0.0001	1.00E-06
278	0.18	0.017	0.047	0.2075	1.1744	0.0001	1.00E-06
279	0.04	0.000	0.063	0.2068	1.1740	0.0001	1.00E-06
280	0.02	0.000	0.048	0.2044	1.1736	0.0001	1.00E-06

281		0.04	0.000	0.039	0.2047	1.1732	0.0001	9.99E-07
282		0.31	0.065	0.048	0.2180	1.1728	0.0001	9.99E-07
283		0.00	0.000	0.155	0.2090	1.1724	0.0001	9.99E-07
284		0.00	0.000	0.023	0.2068	1.1720	0.0001	9.98E-07
285		0.00	0.000	0.021	0.2047	1.1716	0.0001	9.98E-07
286		0.11	0.000	0.029	0.2126	1.1712	0.0001	9.98E-07
287		0.00	0.000	0.116	0.2011	1.1708	0.0001	9.97E-07
288		0.00	0.000	0.023	0.1988	1.1703	0.0001	9.97E-07
289		0.00	0.000	0.017	0.1971	1.1699	0.0001	9.97E-07
290		0.16	0.009	0.020	0.2096	1.1695	0.0001	9.96E-07
291		0.00	0.000	0.018	0.2087	1.1691	0.0001	9.96E-07
292		0.00	0.000	0.014	0.2073	1.1687	0.0001	9.96E-07
293		0.01	0.000	0.019	0.2063	1.1683	0.0001	9.95E-07
294		0.00	0.000	0.013	0.2050	1.1679	0.0001	9.95E-07
295		0.00	0.000	0.013	0.2038	1.1675	0.0001	9.95E-07
296		0.00	0.000	0.012	0.2026	1.1671	0.0001	9.95E-07
297		1.46	0.706	0.027	0.2181	1.1667	0.0001	9.94E-07
298		1.23	0.798	0.215	0.2297	1.1663	0.0001	9.94E-07
299		0.02	0.226	0.125	0.2413	1.1659	0.0001	9.94E-07
300	*	1.29	0.007	0.023	0.2530	1.1655	0.0001	9.93E-07
301	*	0.00	0.000	0.025	0.2550	1.1650	0.0001	9.93E-07
302	*	0.00	0.000	0.033	0.2570	1.1646	0.0001	9.93E-07
303		0.00	0.128	0.001	0.2697	1.1642	0.0001	9.92E-07
304		0.00	0.554	0.014	0.2814	1.1638	0.0001	9.92E-07
305		0.00	0.017	0.180	0.2930	1.1634	0.0001	9.92E-07
306		0.00	0.000	0.086	0.2861	1.1630	0.0001	9.91E-07
307	*	0.00	0.000	0.036	0.2826	1.1626	0.0001	9.91E-07
308	*	0.00	0.000	0.000	0.2826	1.1622	0.0001	9.91E-07
309		0.00	0.000	0.072	0.2754	1.1618	0.0001	9.90E-07
310		0.00	0.000	0.106	0.2648	1.1614	0.0001	9.90E-07
311		0.00	0.000	0.228	0.2421	1.1610	0.0001	9.90E-07
312		0.30	0.050	0.092	0.2528	1.1606	0.0001	9.89E-07

313		0.00	0.000	0.178	0.2399	1.1602	0.0001	9.89E-07
314		0.00	0.000	0.200	0.2198	1.1619	0.0001	9.90E-07
315		0.00	0.000	0.188	0.2011	1.1622	0.0001	9.91E-07
316		0.11	0.000	0.045	0.2057	1.1960	0.0001	1.02E-06
317		0.11	0.000	0.035	0.2133	1.2162	0.0001	1.03E-06
318		0.15	0.002	0.029	0.2250	1.2158	0.0001	1.03E-06
319		0.03	0.000	0.037	0.2244	1.2153	0.0001	1.03E-06
320		0.01	0.000	0.029	0.2227	1.2149	0.0001	1.03E-06
321		0.00	0.000	0.020	0.2207	1.2145	0.0001	1.03E-06
322		0.00	0.000	0.019	0.2188	1.2140	0.0001	1.03E-06
323		0.00	0.000	0.017	0.2171	1.2136	0.0001	1.03E-06
324		0.00	0.000	0.016	0.2155	1.2132	0.0001	1.03E-06
325		0.00	0.000	0.015	0.2140	1.2128	0.0001	1.03E-06
326		0.00	0.000	0.015	0.2125	1.2123	0.0001	1.03E-06
327		0.00	0.000	0.014	0.2112	1.2119	0.0001	1.03E-06
328		0.00	0.000	0.013	0.2098	1.2115	0.0001	1.03E-06
329		0.00	0.000	0.013	0.2086	1.2111	0.0001	1.03E-06
330		0.00	0.000	0.012	0.2073	1.2107	0.0001	1.03E-06
331		0.00	0.000	0.011	0.2062	1.2102	0.0001	1.03E-06
332		0.30	0.069	0.027	0.2201	1.2098	0.0001	1.03E-06
333		0.01	0.000	0.087	0.2189	1.2094	0.0001	1.03E-06
334		0.52	0.174	0.026	0.2334	1.2090	0.0001	1.03E-06
335		0.19	0.056	0.134	0.2450	1.2085	0.0001	1.03E-06
336		0.00	0.000	0.124	0.2382	1.2081	0.0001	1.03E-06
337		0.19	0.019	0.068	0.2466	1.2077	0.0001	1.03E-06
338		0.00	0.000	0.128	0.2357	1.2073	0.0001	1.03E-06
339		0.00	0.000	0.098	0.2259	1.2068	0.0001	1.03E-06
340		0.00	0.000	0.045	0.2213	1.2064	0.0001	1.03E-06
341		0.00	0.000	0.037	0.2177	1.2060	0.0001	1.02E-06
342		0.00	0.000	0.054	0.2122	1.2056	0.0001	1.02E-06
343		0.00	0.000	0.046	0.2076	1.2052	0.0001	1.02E-06
344	*	0.00	0.000	0.000	0.2076	1.2047	0.0001	1.02E-06

345	*	0.00	0.000	0.000	0.2077	1.2043	0.0001	1.02E-06
346		0.00	0.000	0.049	0.2027	1.2039	0.0001	1.02E-06
347		0.00	0.000	0.031	0.1998	1.2035	0.0001	1.02E-06
348		0.11	0.000	0.039	0.2072	1.2030	0.0001	1.02E-06
349	*	0.02	0.000	0.023	0.2072	1.2026	0.0001	1.02E-06
350	*	0.00	0.000	0.022	0.2050	1.2023	0.0001	1.02E-06
351		0.00	0.000	0.039	0.2016	1.2020	0.0001	1.02E-06
352		0.01	0.000	0.043	0.1979	1.2016	0.0001	1.02E-06
353		0.00	0.000	0.009	0.1970	1.2011	0.0001	1.02E-06
354		0.00	0.000	0.000	0.1970	1.2007	0.0001	1.02E-06
355		0.00	0.000	0.000	0.1970	1.2003	0.0001	1.02E-06
356		0.00	0.000	0.000	0.1970	1.1999	0.0001	1.02E-06
357	*	0.00	0.000	0.000	0.1970	1.1995	0.0001	1.02E-06
358	*	0.00	0.000	0.000	0.1970	1.1990	0.0001	1.02E-06
359	*	0.00	0.000	0.000	0.1970	1.1986	0.0001	1.02E-06
360	*	0.00	0.000	0.000	0.1970	1.1982	0.0001	1.02E-06
361	*	0.00	0.000	0.000	0.1970	1.1978	0.0001	1.02E-06
362	*	0.00	0.000	0.000	0.1970	1.1974	0.0001	1.02E-06
363	*	0.00	0.000	0.000	0.1970	1.1969	0.0001	1.02E-06
364		0.00	0.000	0.000	0.1970	1.1965	0.0001	1.02E-06
365		0.00	0.000	0.000	0.1970	1.1961	0.0001	1.02E-06

* = Frozen (air or soil)

Annual Totals for Year 9			
	inches	cubic feet	percent
Precipitation	32.25	117,064.9	100.00
Runoff	11.656	42,309.8	36.14
Evapotranspiration	20.656	74,981.0	64.05
Recirculation into Layer 1	0.0505	183.4	0.16
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0505	183.4	0.16
Percolation/Leakage through Layer 5	0.000378	1.3732	0.00
Average Head on Top of Layer 4	1.2209	---	---
Change in Water Storage	-0.0626	-227.3	-0.19
Soil Water at Start of Year	293.3945	1,065,022.2	909.77
Soil Water at End of Year	293.3319	1,064,794.9	909.58
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0505	-183.4	-0.16

Daily Output for Year 10

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.000	0.1970	1.1957	0.0001	1.02E-06
2			0.00	0.000	0.000	0.1970	1.1953	0.0001	1.02E-06
3			0.00	0.000	0.000	0.1970	1.1949	0.0001	1.02E-06
4			0.00	0.000	0.000	0.1970	1.1944	0.0001	1.02E-06
5			0.00	0.000	0.000	0.1970	1.1940	0.0001	1.02E-06
6			0.00	0.000	0.000	0.1970	1.1936	0.0001	1.02E-06
7			0.00	0.000	0.000	0.1970	1.1932	0.0001	1.01E-06
8			0.00	0.000	0.000	0.1970	1.1928	0.0001	1.01E-06
9			0.00	0.000	0.000	0.1970	1.1923	0.0001	1.01E-06
10			0.00	0.000	0.000	0.1970	1.1919	0.0001	1.01E-06
11			0.00	0.000	0.000	0.1970	1.1915	0.0001	1.01E-06
12			0.00	0.000	0.000	0.1970	1.1911	0.0001	1.01E-06
13			0.00	0.000	0.000	0.1970	1.1907	0.0001	1.01E-06
14			0.00	0.000	0.000	0.1970	1.1903	0.0001	1.01E-06
15			0.06	0.000	0.011	0.2023	1.1898	0.0001	1.01E-06
16			0.01	0.000	0.011	0.2019	1.1894	0.0001	1.01E-06
17			0.42	0.131	0.023	0.2158	1.1890	0.0001	1.01E-06
18			0.01	0.000	0.147	0.2155	1.1886	0.0001	1.01E-06
19			0.00	0.000	0.010	0.2146	1.1882	0.0001	1.01E-06
20			0.00	0.000	0.009	0.2138	1.1878	0.0001	1.01E-06
21			0.00	0.000	0.008	0.2129	1.1873	0.0001	1.01E-06
22			0.00	0.000	0.008	0.2121	1.1869	0.0001	1.01E-06
23			0.00	0.000	0.008	0.2113	1.1865	0.0001	1.01E-06
24	*		0.00	0.000	0.008	0.2105	1.1861	0.0001	1.01E-06

25			0.00	0.000	0.008	0.2097	1.1857	0.0001	1.01E-06
26			0.00	0.000	0.008	0.2089	1.1853	0.0001	1.01E-06
27			0.00	0.000	0.008	0.2082	1.1848	0.0001	1.01E-06
28			0.00	0.000	0.008	0.2074	1.1844	0.0001	1.01E-06
29			0.00	0.000	0.008	0.2067	1.1840	0.0001	1.01E-06
30			0.00	0.000	0.007	0.2059	1.1836	0.0001	1.01E-06
31	*		0.00	0.000	0.000	0.2060	1.1832	0.0001	1.01E-06
32	*		0.00	0.000	0.000	0.2060	1.1828	0.0001	1.01E-06
33	*		0.00	0.000	0.000	0.2060	1.1824	0.0001	1.01E-06
34	*		0.00	0.000	0.000	0.2060	1.1819	0.0001	1.01E-06
35	*		0.00	0.000	0.000	0.2060	1.1815	0.0001	1.01E-06
36			0.00	0.000	0.008	0.2053	1.1811	0.0001	1.01E-06
37			0.00	0.000	0.007	0.2045	1.1807	0.0001	1.01E-06
38			0.00	0.000	0.007	0.2038	1.1803	0.0001	1.00E-06
39	*		0.00	0.000	0.007	0.2031	1.1799	0.0001	1.00E-06
40	*		0.00	0.000	0.000	0.2031	1.1795	0.0001	1.00E-06
41	*		0.03	0.000	0.013	0.2049	1.1790	0.0001	1.00E-06
42	*		0.00	0.000	0.000	0.2049	1.1786	0.0001	1.00E-06
43	*		0.00	0.000	0.000	0.2049	1.1782	0.0001	1.00E-06
44	*		0.00	0.000	0.007	0.2042	1.1778	0.0001	1.00E-06
45	*		0.00	0.000	0.000	0.2042	1.1774	0.0001	1.00E-06
46	*		0.17	0.000	0.018	0.2062	1.1770	0.0001	1.00E-06
47	*		0.24	0.000	0.000	0.2082	1.1766	0.0001	1.00E-06
48	*		0.12	0.000	0.000	0.2102	1.1762	0.0001	1.00E-06
49			0.13	0.080	0.000	0.2229	1.1757	0.0001	1.00E-06
50			0.00	0.126	0.012	0.2346	1.1753	0.0001	1.00E-06
51			0.00	0.000	0.094	0.2377	1.1749	0.0001	1.00E-06
52			0.01	0.000	0.077	0.2311	1.1745	0.0001	1.00E-06
53			0.49	0.147	0.059	0.2455	1.1741	0.0001	1.00E-06
54			0.24	0.078	0.115	0.2572	1.1737	0.0001	1.00E-06
55	*		0.54	0.000	0.028	0.2594	1.1733	0.0001	9.99E-07
56	*	*	0.06	0.000	0.032	0.2594	1.1729	0.0001	9.99E-07

57	*	*	0.00	0.000	0.018	0.2594	1.1725	0.0001	9.99E-07
58	*	*	0.00	0.000	0.024	0.2595	1.1720	0.0001	9.98E-07
59		*	0.00	0.007	0.033	0.2666	1.1716	0.0001	9.98E-07
60	*	*	0.22	0.000	0.025	0.2666	1.1712	0.0001	9.98E-07
61	*	*	0.09	0.000	0.017	0.2666	1.1708	0.0001	9.97E-07
62	*	*	0.00	0.000	0.010	0.2666	1.1704	0.0001	9.97E-07
63	*	*	0.00	0.000	0.028	0.2667	1.1700	0.0001	9.97E-07
64		*	0.00	0.435	0.056	0.2667	1.1696	0.0001	9.96E-07
65		*	0.00	0.000	0.095	0.2750	1.1692	0.0001	9.96E-07
66		*	0.00	0.000	0.000	0.2750	1.1688	0.0001	9.96E-07
67	*	*	0.00	0.000	0.000	0.2751	1.1684	0.0001	9.95E-07
68		*	0.00	0.000	0.000	0.2751	1.1679	0.0001	9.95E-07
69			0.00	0.000	0.059	0.2691	1.1675	0.0001	9.95E-07
70			0.00	0.000	0.099	0.2593	1.1671	0.0001	9.95E-07
71			0.00	0.000	0.086	0.2507	1.1667	0.0001	9.94E-07
72	*		0.00	0.000	0.045	0.2463	1.1663	0.0001	9.94E-07
73			0.00	0.000	0.161	0.2302	1.1659	0.0001	9.94E-07
74			0.00	0.000	0.095	0.2207	1.1655	0.0001	9.93E-07
75			0.00	0.000	0.136	0.2072	1.1651	0.0001	9.93E-07
76			0.02	0.000	0.104	0.1989	1.1647	0.0001	9.93E-07
77			0.00	0.000	0.015	0.1974	1.1651	0.0001	9.93E-07
78	*		0.00	0.000	0.004	0.1970	1.1651	0.0001	9.93E-07
79			0.00	0.000	0.000	0.1970	1.1647	0.0001	9.93E-07
80			0.00	0.000	0.000	0.1970	1.1643	0.0001	9.92E-07
81			0.00	0.000	0.000	0.1970	1.1639	0.0001	9.92E-07
82			1.33	0.619	0.037	0.2133	1.1635	0.0001	9.92E-07
83			0.16	0.179	0.199	0.2249	1.1631	0.0001	9.91E-07
84			0.15	0.013	0.196	0.2359	1.1627	0.0001	9.91E-07
85			0.00	0.000	0.087	0.2285	1.1623	0.0001	9.91E-07
86			0.00	0.000	0.060	0.2225	1.1619	0.0001	9.90E-07
87			0.00	0.000	0.114	0.2111	1.1614	0.0001	9.90E-07
88			0.47	0.086	0.143	0.2268	1.1610	0.0001	9.90E-07

89		0.00	0.000	0.136	0.2218	1.1606	0.0001	9.89E-07
90		0.00	0.000	0.062	0.2156	1.1602	0.0001	9.89E-07
91	*	0.00	0.000	0.000	0.2157	1.1598	0.0001	9.89E-07
92	*	0.00	0.000	0.000	0.2157	1.1594	0.0001	9.89E-07
93		0.00	0.000	0.110	0.2047	1.1590	0.0001	9.88E-07
94		0.00	0.000	0.047	0.2000	1.1586	0.0001	9.88E-07
95		0.00	0.000	0.026	0.1974	1.1582	0.0001	9.88E-07
96		0.00	0.000	0.002	0.1972	1.1578	0.0001	9.87E-07
97		0.85	0.322	0.068	0.2135	1.1574	0.0001	9.87E-07
98		0.00	0.005	0.172	0.2251	1.1570	0.0001	9.87E-07
99		0.00	0.000	0.081	0.2175	1.1566	0.0001	9.86E-07
100		0.00	0.000	0.107	0.2068	1.1562	0.0001	9.86E-07
101		0.00	0.000	0.084	0.1985	1.1558	0.0001	9.86E-07
102		0.00	0.000	0.010	0.1975	1.1554	0.0001	9.85E-07
103		0.35	0.047	0.149	0.2079	1.1550	0.0001	9.85E-07
104		0.00	0.000	0.123	0.2004	1.1546	0.0001	9.85E-07
105		0.00	0.000	0.025	0.1979	1.1542	0.0001	9.84E-07
106		0.41	0.098	0.056	0.2136	1.1537	0.0001	9.84E-07
107		0.06	0.000	0.234	0.2056	1.1533	0.0001	9.84E-07
108		0.23	0.026	0.193	0.2043	1.1529	0.0001	9.83E-07
109		0.79	0.273	0.177	0.2158	1.1525	0.0001	9.83E-07
110		0.00	0.000	0.376	0.2032	1.1521	0.0001	9.83E-07
111		0.00	0.000	0.046	0.1986	1.1517	0.0001	9.82E-07
112		0.00	0.000	0.016	0.1970	1.1513	0.0001	9.82E-07
113		0.00	0.000	0.000	0.1970	1.1509	0.0001	9.82E-07
114		0.00	0.000	0.000	0.1970	1.1505	0.0001	9.82E-07
115		0.00	0.000	0.000	0.1970	1.1501	0.0001	9.81E-07
116		0.00	0.000	0.000	0.1970	1.1497	0.0001	9.81E-07
117		0.00	0.000	0.000	0.1970	1.1493	0.0001	9.81E-07
118		0.00	0.000	0.000	0.1970	1.1489	0.0001	9.80E-07
119		0.00	0.000	0.000	0.1970	1.1485	0.0001	9.80E-07
120	*	0.00	0.000	0.000	0.1970	1.1481	0.0001	9.80E-07

121	0.00	0.000	0.000	0.1970	1.1477	0.0001	9.79E-07
122	0.22	0.037	0.019	0.2097	1.1473	0.0001	9.79E-07
123	0.00	0.000	0.047	0.2088	1.1469	0.0001	9.79E-07
124	0.25	0.039	0.030	0.2225	1.1465	0.0001	9.78E-07
125	0.00	0.000	0.053	0.2211	1.1461	0.0001	9.78E-07
126	0.00	0.000	0.013	0.2198	1.1457	0.0001	9.78E-07
127	0.00	0.000	0.013	0.2185	1.1453	0.0001	9.77E-07
128	0.00	0.000	0.012	0.2173	1.1449	0.0001	9.77E-07
129	0.00	0.000	0.012	0.2161	1.1445	0.0001	9.77E-07
130	0.00	0.000	0.012	0.2149	1.1441	0.0001	9.77E-07
131	0.00	0.000	0.011	0.2138	1.1437	0.0001	9.76E-07
132	0.00	0.000	0.012	0.2127	1.1433	0.0001	9.76E-07
133	0.00	0.000	0.012	0.2115	1.1429	0.0001	9.76E-07
134	0.05	0.000	0.022	0.2147	1.1425	0.0001	9.75E-07
135	0.00	0.000	0.014	0.2134	1.1421	0.0001	9.75E-07
136	0.00	0.000	0.014	0.2120	1.1417	0.0001	9.75E-07
137	0.05	0.000	0.023	0.2151	1.1413	0.0001	9.74E-07
138	1.70	0.884	0.026	0.2277	1.1409	0.0001	9.74E-07
139	0.03	0.190	0.200	0.2393	1.1405	0.0001	9.74E-07
140	0.00	0.000	0.204	0.2379	1.1401	0.0001	9.73E-07
141	0.32	0.032	0.159	0.2472	1.1397	0.0001	9.73E-07
142	0.00	0.000	0.156	0.2349	1.1393	0.0001	9.73E-07
143	0.00	0.000	0.314	0.2039	1.1389	0.0001	9.72E-07
144	0.00	0.000	0.063	0.1976	1.1385	0.0001	9.72E-07
145	0.00	0.000	0.003	0.1973	1.1381	0.0001	9.72E-07
146	0.00	0.000	0.003	0.1970	1.1377	0.0001	9.72E-07
147	0.00	0.000	0.000	0.1970	1.1373	0.0001	9.71E-07
148	0.00	0.000	0.000	0.1970	1.1369	0.0001	9.71E-07
149	0.00	0.000	0.000	0.1970	1.1365	0.0001	9.71E-07
150	0.00	0.000	0.000	0.1970	1.1361	0.0001	9.70E-07
151	0.00	0.000	0.000	0.1970	1.1357	0.0001	9.70E-07
152	0.00	0.000	0.000	0.1970	1.1353	0.0001	9.70E-07

153	0.00	0.000	0.000	0.1970	1.1349	0.0001	9.69E-07
154	0.00	0.000	0.000	0.1970	1.1345	0.0001	9.69E-07
155	0.33	0.076	0.033	0.2113	1.1341	0.0001	9.69E-07
156	0.06	0.000	0.096	0.2150	1.1337	0.0001	9.68E-07
157	1.33	0.662	0.032	0.2276	1.1333	0.0001	9.68E-07
158	0.19	0.094	0.405	0.2392	1.1329	0.0001	9.68E-07
159	0.32	0.027	0.400	0.2355	1.1325	0.0001	9.67E-07
160	0.05	0.000	0.198	0.2236	1.1321	0.0001	9.67E-07
161	0.06	0.000	0.217	0.2078	1.1317	0.0001	9.67E-07
162	0.48	0.025	0.335	0.2172	1.1314	0.0001	9.67E-07
163	0.02	0.000	0.174	0.2044	1.1310	0.0001	9.66E-07
164	0.00	0.000	0.054	0.1989	1.1307	0.0001	9.66E-07
165	0.00	0.000	0.016	0.1973	1.1308	0.0001	9.66E-07
166	0.00	0.000	0.003	0.1970	1.1304	0.0001	9.66E-07
167	0.00	0.000	0.000	0.1970	1.1300	0.0001	9.65E-07
168	0.00	0.000	0.000	0.1970	1.1296	0.0001	9.65E-07
169	0.00	0.000	0.000	0.1970	1.1292	0.0001	9.65E-07
170	0.00	0.000	0.000	0.1970	1.1288	0.0001	9.65E-07
171	0.00	0.000	0.000	0.1970	1.1284	0.0001	9.64E-07
172	0.00	0.000	0.000	0.1970	1.1280	0.0001	9.64E-07
173	0.11	0.000	0.012	0.2070	1.1276	0.0001	9.64E-07
174	0.00	0.000	0.010	0.2060	1.1272	0.0001	9.63E-07
175	0.00	0.000	0.013	0.2046	1.1268	0.0001	9.63E-07
176	0.00	0.000	0.016	0.2031	1.1264	0.0001	9.63E-07
177	0.00	0.000	0.016	0.2016	1.1260	0.0001	9.62E-07
178	0.00	0.000	0.015	0.2001	1.1256	0.0001	9.62E-07
179	1.09	0.482	0.031	0.2156	1.1252	0.0001	9.62E-07
180	0.14	0.033	0.375	0.2272	1.1249	0.0001	9.61E-07
181	0.26	0.032	0.191	0.2308	1.1245	0.0001	9.61E-07
182	0.05	0.000	0.241	0.2148	1.1241	0.0001	9.61E-07
183	0.00	0.000	0.121	0.2027	1.1237	0.0001	9.61E-07
184	0.00	0.000	0.040	0.1987	1.1233	0.0001	9.60E-07

185	0.00	0.000	0.015	0.1973	1.1229	0.0001	9.60E-07
186	0.55	0.161	0.073	0.2131	1.1225	0.0001	9.60E-07
187	0.15	0.005	0.246	0.2187	1.1221	0.0001	9.59E-07
188	0.00	0.000	0.138	0.2054	1.1217	0.0001	9.59E-07
189	0.00	0.000	0.063	0.1991	1.1213	0.0001	9.59E-07
190	0.00	0.000	0.021	0.1970	1.1209	0.0001	9.58E-07
191	0.09	0.000	0.014	0.2048	1.1205	0.0001	9.58E-07
192	0.00	0.000	0.017	0.2031	1.1201	0.0001	9.58E-07
193	0.00	0.000	0.021	0.2010	1.1197	0.0001	9.57E-07
194	0.00	0.000	0.023	0.1987	1.1194	0.0001	9.57E-07
195	0.00	0.000	0.009	0.1978	1.1190	0.0001	9.57E-07
196	0.00	0.000	0.007	0.1972	1.1186	0.0001	9.57E-07
197	0.00	0.000	0.002	0.1970	1.1182	0.0001	9.56E-07
198	0.00	0.000	0.000	0.1970	1.1178	0.0001	9.56E-07
199	0.00	0.000	0.000	0.1970	1.1174	0.0001	9.56E-07
200	0.08	0.000	0.012	0.2037	1.1170	0.0001	9.55E-07
201	0.12	0.000	0.020	0.2134	1.1166	0.0001	9.55E-07
202	0.00	0.000	0.009	0.2125	1.1162	0.0001	9.55E-07
203	0.08	0.000	0.024	0.2176	1.1158	0.0001	9.54E-07
204	0.01	0.000	0.020	0.2168	1.1154	0.0001	9.54E-07
205	0.03	0.000	0.023	0.2175	1.1151	0.0001	9.54E-07
206	0.10	0.000	0.026	0.2253	1.1147	0.0001	9.53E-07
207	0.00	0.000	0.018	0.2238	1.1143	0.0001	9.53E-07
208	0.21	0.028	0.023	0.2365	1.1139	0.0001	9.53E-07
209	2.34	1.399	0.060	0.2476	1.1135	0.0001	9.53E-07
210	0.02	0.196	0.309	0.2593	1.1131	0.0001	9.52E-07
211	0.03	0.000	0.388	0.2431	1.1127	0.0001	9.52E-07
212	0.41	0.030	0.319	0.2467	1.1123	0.0001	9.52E-07
213	0.04	0.000	0.303	0.2232	1.1119	0.0001	9.51E-07
214	0.00	0.000	0.113	0.2119	1.1115	0.0001	9.51E-07
215	0.00	0.000	0.124	0.1995	1.1111	0.0001	9.51E-07
216	0.00	0.000	0.017	0.1978	1.1108	0.0001	9.50E-07

217	0.00	0.000	0.008	0.1970	1.1104	0.0001	9.50E-07
218	0.00	0.000	0.000	0.1970	1.1100	0.0001	9.50E-07
219	0.00	0.000	0.000	0.1970	1.1096	0.0001	9.49E-07
220	0.00	0.000	0.000	0.1970	1.1092	0.0001	9.49E-07
221	0.00	0.000	0.000	0.1970	1.1088	0.0001	9.49E-07
222	0.00	0.000	0.000	0.1970	1.1084	0.0001	9.49E-07
223	0.00	0.000	0.000	0.1970	1.1080	0.0001	9.48E-07
224	0.00	0.000	0.000	0.1970	1.1077	0.0001	9.48E-07
225	0.03	0.000	0.012	0.1984	1.1073	0.0001	9.48E-07
226	0.08	0.000	0.012	0.2054	1.1069	0.0001	9.47E-07
227	0.18	0.018	0.021	0.2176	1.1065	0.0001	9.47E-07
228	0.00	0.000	0.028	0.2166	1.1061	0.0001	9.47E-07
229	0.61	0.232	0.031	0.2297	1.1057	0.0001	9.46E-07
230	0.00	0.000	0.223	0.2294	1.1053	0.0001	9.46E-07
231	0.54	0.130	0.163	0.2424	1.1049	0.0001	9.46E-07
232	0.03	0.000	0.334	0.2241	1.1045	0.0001	9.46E-07
233	0.27	0.039	0.139	0.2299	1.1042	0.0001	9.45E-07
234	0.00	0.000	0.326	0.2011	1.1038	0.0001	9.45E-07
235	0.00	0.000	0.035	0.1977	1.1034	0.0001	9.45E-07
236	0.00	0.000	0.004	0.1973	1.1030	0.0001	9.44E-07
237	0.00	0.000	0.006	0.1970	1.1026	0.0001	9.44E-07
238	0.00	0.000	0.000	0.1970	1.1022	0.0001	9.44E-07
239	0.00	0.000	0.000	0.1970	1.1018	0.0001	9.43E-07
240	0.00	0.000	0.000	0.1970	1.1015	0.0001	9.43E-07
241	0.00	0.000	0.000	0.1970	1.1011	0.0001	9.43E-07
242	0.00	0.000	0.000	0.1970	1.1007	0.0001	9.42E-07
243	0.00	0.000	0.000	0.1970	1.1003	0.0001	9.42E-07
244	0.16	0.005	0.021	0.2096	1.0999	0.0001	9.42E-07
245	0.00	0.000	0.015	0.2086	1.0995	0.0001	9.42E-07
246	0.00	0.000	0.015	0.2071	1.0991	0.0001	9.41E-07
247	0.37	0.094	0.031	0.2218	1.0988	0.0001	9.41E-07
248	0.86	0.387	0.124	0.2334	1.0984	0.0001	9.41E-07

249		0.00	0.049	0.112	0.2450	1.0980	0.0001	9.40E-07
250		0.00	0.000	0.090	0.2409	1.0976	0.0001	9.40E-07
251		0.00	0.000	0.065	0.2344	1.0972	0.0001	9.40E-07
252		0.00	0.000	0.195	0.2149	1.0968	0.0001	9.39E-07
253		0.08	0.000	0.166	0.2061	1.0965	0.0001	9.39E-07
254		0.56	0.149	0.122	0.2199	1.0961	0.0001	9.39E-07
255		1.00	0.374	0.352	0.2315	1.0957	0.0001	9.39E-07
256		1.55	0.940	0.148	0.2431	1.0953	0.0001	9.38E-07
257		0.00	0.103	0.326	0.2548	1.0949	0.0001	9.38E-07
258		0.00	0.000	0.217	0.2434	1.0945	0.0001	9.38E-07
259		0.00	0.000	0.095	0.2338	1.0945	0.0001	9.38E-07
260		0.00	0.000	0.063	0.2276	1.0944	0.0001	9.38E-07
261		0.00	0.000	0.111	0.2165	1.0940	0.0001	9.37E-07
262		0.00	0.000	0.068	0.2098	1.0936	0.0001	9.37E-07
263	*	0.00	0.000	0.043	0.2054	1.0932	0.0001	9.37E-07
264	*	0.92	0.000	0.033	0.2074	1.0928	0.0001	9.36E-07
265		0.00	0.370	0.000	0.2218	1.0925	0.0001	9.36E-07
266		0.53	0.346	0.083	0.2334	1.0921	0.0001	9.36E-07
267		0.56	0.344	0.113	0.2450	1.0917	0.0001	9.35E-07
268		0.00	0.026	0.157	0.2567	1.0913	0.0001	9.35E-07
269		0.00	0.000	0.150	0.2443	1.0909	0.0001	9.35E-07
270		0.00	0.000	0.108	0.2335	1.0906	0.0001	9.35E-07
271		0.00	0.000	0.108	0.2227	1.0902	0.0001	9.34E-07
272		0.00	0.000	0.127	0.2101	1.0898	0.0001	9.34E-07
273		0.00	0.000	0.119	0.1982	1.0894	0.0001	9.34E-07
274		0.00	0.000	0.006	0.1976	1.0890	0.0001	9.33E-07
275		0.00	0.000	0.006	0.1970	1.0886	0.0001	9.33E-07
276		0.00	0.000	0.000	0.1970	1.0883	0.0001	9.33E-07
277		0.00	0.000	0.000	0.1970	1.0879	0.0001	9.32E-07
278		0.00	0.000	0.000	0.1970	1.0875	0.0001	9.32E-07
279		0.00	0.000	0.000	0.1970	1.0871	0.0001	9.32E-07
280		0.00	0.000	0.000	0.1970	1.0867	0.0001	9.32E-07

281	*	0.01	0.000	0.013	0.1970	1.0864	0.0001	9.31E-07
282		0.00	0.000	0.000	0.1970	1.0860	0.0001	9.31E-07
283	*	0.00	0.000	0.000	0.1970	1.0856	0.0001	9.31E-07
284		0.00	0.000	0.000	0.1970	1.0852	0.0001	9.30E-07
285		1.62	0.806	0.031	0.2133	1.0848	0.0001	9.30E-07
286		0.00	0.193	0.121	0.2249	1.0845	0.0001	9.30E-07
287	*	0.00	0.000	0.062	0.2250	1.0841	0.0001	9.29E-07
288		0.00	0.000	0.058	0.2250	1.0837	0.0001	9.29E-07
289		0.00	0.000	0.000	0.2250	1.0833	0.0001	9.29E-07
290	*	0.00	0.000	0.076	0.2247	1.0829	0.0001	9.29E-07
291		0.00	0.000	0.032	0.2215	1.0826	0.0001	9.28E-07
292		0.00	0.000	0.066	0.2149	1.0822	0.0001	9.28E-07
293		0.00	0.000	0.077	0.2072	1.0818	0.0001	9.28E-07
294		0.00	0.000	0.083	0.1989	1.0814	0.0001	9.27E-07
295		0.00	0.000	0.018	0.1972	1.0810	0.0001	9.27E-07
296		0.00	0.000	0.001	0.1971	1.0807	0.0001	9.27E-07
297		0.00	0.000	0.001	0.1970	1.0803	0.0001	9.26E-07
298		0.13	0.000	0.016	0.2084	1.0799	0.0001	9.26E-07
299		0.30	0.042	0.088	0.2212	1.0795	0.0001	9.26E-07
300		0.00	0.000	0.052	0.2204	1.0791	0.0001	9.26E-07
301		0.10	0.000	0.070	0.2237	1.0788	0.0001	9.25E-07
302		0.00	0.000	0.081	0.2156	1.0784	0.0001	9.25E-07
303		0.00	0.000	0.057	0.2099	1.0780	0.0001	9.25E-07
304		0.00	0.000	0.075	0.2024	1.0776	0.0001	9.24E-07
305		0.70	0.216	0.120	0.2183	1.0773	0.0001	9.24E-07
306		0.00	0.000	0.182	0.2208	1.0769	0.0001	9.24E-07
307		0.00	0.000	0.110	0.2098	1.0765	0.0001	9.23E-07
308		0.00	0.000	0.102	0.1996	1.0761	0.0001	9.23E-07
309		0.58	0.124	0.170	0.2159	1.0758	0.0001	9.23E-07
310		0.23	0.037	0.163	0.2275	1.0754	0.0001	9.23E-07
311		0.01	0.000	0.122	0.2200	1.0750	0.0001	9.22E-07
312		0.05	0.000	0.106	0.2142	1.0746	0.0001	9.22E-07

313		0.01	0.000	0.106	0.2051	1.0743	0.0001	9.22E-07
314		0.00	0.000	0.062	0.1989	1.0739	0.0001	9.21E-07
315		0.00	0.000	0.015	0.1974	1.0735	0.0001	9.21E-07
316		0.00	0.000	0.003	0.1971	1.0731	0.0001	9.21E-07
317		0.00	0.000	0.001	0.1970	1.0728	0.0001	9.21E-07
318		0.00	0.000	0.000	0.1970	1.0724	0.0001	9.20E-07
319		0.00	0.000	0.000	0.1970	1.0720	0.0001	9.20E-07
320		0.53	0.164	0.041	0.2133	1.0716	0.0001	9.20E-07
321		0.00	0.000	0.109	0.2188	1.0713	0.0001	9.19E-07
322		0.00	0.000	0.036	0.2152	1.0709	0.0001	9.19E-07
323		0.00	0.000	0.067	0.2085	1.0705	0.0001	9.19E-07
324		0.00	0.000	0.085	0.2001	1.0701	0.0001	9.18E-07
325		0.00	0.000	0.031	0.1970	1.0698	0.0001	9.18E-07
326		0.00	0.000	0.000	0.1970	1.0694	0.0001	9.18E-07
327		0.00	0.000	0.002	0.1970	1.0690	0.0001	9.18E-07
328		0.00	0.000	0.000	0.1970	1.0686	0.0001	9.17E-07
329		0.00	0.000	0.000	0.1970	1.0683	0.0001	9.17E-07
330		0.00	0.000	0.000	0.1970	1.0679	0.0001	9.17E-07
331		0.00	0.000	0.000	0.1970	1.0675	0.0001	9.16E-07
332		0.00	0.000	0.000	0.1970	1.0671	0.0001	9.16E-07
333		0.00	0.000	0.000	0.1970	1.0668	0.0001	9.16E-07
334		0.00	0.000	0.000	0.1970	1.0664	0.0001	9.16E-07
335		0.07	0.000	0.012	0.2023	1.0660	0.0001	9.15E-07
336		0.08	0.000	0.019	0.2082	1.0656	0.0001	9.15E-07
337	*	0.02	0.000	0.019	0.2082	1.0653	0.0001	9.15E-07
338	*	0.00	0.000	0.000	0.2082	1.0649	0.0001	9.14E-07
339	*	0.56	0.000	0.008	0.2102	1.0645	0.0001	9.14E-07
340	*	2.58	0.000	0.000	0.2122	1.0641	0.0001	9.14E-07
341	*	0.00	0.000	0.012	0.2142	1.0638	0.0001	9.13E-07
342	*	0.00	0.000	0.029	0.2161	1.0634	0.0001	9.13E-07
343		0.00	0.716	0.000	0.2289	1.0630	0.0001	9.13E-07
344		0.07	1.334	0.000	0.2405	1.0627	0.0001	9.13E-07

345	0.17	0.325	0.188	0.2522	1.0623	0.0001	9.12E-07
346	0.11	0.084	0.152	0.2638	1.0619	0.0001	9.12E-07
347	0.08	0.000	0.075	0.2730	1.0615	0.0001	9.12E-07
348	0.29	0.047	0.095	0.2847	1.0612	0.0001	9.11E-07
349	0.06	0.000	0.141	0.2803	1.0608	0.0001	9.11E-07
350	0.02	0.000	0.159	0.2667	1.0604	0.0001	9.11E-07
351	0.01	0.000	0.070	0.2603	1.0600	0.0001	9.11E-07
352	0.00	0.000	0.076	0.2528	1.0597	0.0001	9.10E-07
353	0.00	0.000	0.096	0.2432	1.0593	0.0001	9.10E-07
354	0.04	0.000	0.175	0.2293	1.0589	0.0001	9.10E-07
355	0.35	0.062	0.076	0.2444	1.0586	0.0001	9.09E-07
356	0.03	0.000	0.078	0.2456	1.0582	0.0001	9.09E-07
357	0.01	0.000	0.108	0.2360	1.0578	0.0001	9.09E-07
358	0.23	0.035	0.101	0.2423	1.0575	0.0001	9.08E-07
359	0.39	0.097	0.119	0.2540	1.0571	0.0001	9.08E-07
360	0.00	0.000	0.092	0.2545	1.0567	0.0001	9.08E-07
361	0.00	0.000	0.101	0.2444	1.0563	0.0001	9.08E-07
362	0.06	0.000	0.064	0.2441	1.0560	0.0001	9.07E-07
363	0.06	0.000	0.059	0.2439	1.0556	0.0001	9.07E-07
364	0.00	0.000	0.066	0.2373	1.0552	0.0001	9.07E-07
365	0.00	0.000	0.067	0.2307	1.0549	0.0001	9.06E-07

* = Frozen (air or soil)

Annual Totals for Year 10			
	inches	cubic feet	percent
Precipitation	36.96	134,154.8	100.00
Runoff	14.988	54,407.4	40.56
Evapotranspiration	21.678	78,691.9	58.66
Recirculation into Layer 1	0.0465	168.9	0.13
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0465	168.9	0.13
Percolation/Leakage through Layer 5	0.000351	1.2730	0.00
Average Head on Top of Layer 4	1.1241	---	---
Change in Water Storage	0.2904	1,054.3	0.79
Soil Water at Start of Year	293.3319	1,064,794.9	793.71
Soil Water at End of Year	293.6224	1,065,849.2	794.49
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0465	-168.9	-0.13

Daily Output for Year 11

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.01	0.000	0.010	0.2307	1.0545	0.0001	9.06E-07
2			0.05	0.000	0.081	0.2275	1.0541	0.0001	9.06E-07
3	*		0.00	0.000	0.037	0.2238	1.0538	0.0001	9.06E-07
4			0.00	0.000	0.053	0.2185	1.0534	0.0001	9.05E-07
5			0.00	0.000	0.105	0.2081	1.0530	0.0001	9.05E-07
6			0.00	0.000	0.069	0.2012	1.0526	0.0001	9.05E-07
7			0.00	0.000	0.028	0.1985	1.0523	0.0001	9.04E-07
8			0.00	0.000	0.015	0.1970	1.0519	0.0001	9.04E-07
9			0.00	0.000	0.000	0.1970	1.0515	0.0001	9.04E-07
10	*		0.00	0.000	0.000	0.1970	1.0512	0.0001	9.04E-07
11			0.00	0.000	0.000	0.1970	1.0508	0.0001	9.03E-07
12			0.00	0.000	0.000	0.1970	1.0504	0.0001	9.03E-07
13			0.00	0.000	0.000	0.1970	1.0501	0.0001	9.03E-07
14			0.00	0.000	0.000	0.1970	1.0497	0.0001	9.02E-07
15			0.00	0.000	0.000	0.1970	1.0493	0.0001	9.02E-07
16	*		0.00	0.000	0.000	0.1970	1.0490	0.0001	9.02E-07
17	*		0.00	0.000	0.000	0.1970	1.0486	0.0001	9.02E-07
18			0.00	0.000	0.000	0.1970	1.0482	0.0001	9.01E-07
19			0.00	0.000	0.000	0.1970	1.0479	0.0001	9.01E-07
20			0.00	0.000	0.000	0.1970	1.0475	0.0001	9.01E-07
21	*		0.00	0.000	0.000	0.1970	1.0471	0.0001	9.00E-07
22			0.00	0.000	0.000	0.1970	1.0468	0.0001	9.00E-07
23			0.00	0.000	0.000	0.1970	1.0464	0.0001	9.00E-07
24			0.00	0.000	0.000	0.1970	1.0460	0.0001	8.99E-07

25		0.00	0.000	0.000	0.1970	1.0457	0.0001	8.99E-07
26		0.00	0.000	0.000	0.1970	1.0453	0.0001	8.99E-07
27		0.00	0.000	0.000	0.1970	1.0449	0.0001	8.99E-07
28		0.00	0.000	0.000	0.1970	1.0446	0.0001	8.98E-07
29		0.00	0.000	0.000	0.1970	1.0442	0.0001	8.98E-07
30		0.00	0.000	0.000	0.1970	1.0438	0.0001	8.98E-07
31		0.00	0.000	0.000	0.1970	1.0435	0.0001	8.97E-07
32		0.00	0.000	0.000	0.1970	1.0431	0.0001	8.97E-07
33	*	0.00	0.000	0.000	0.1970	1.0427	0.0001	8.97E-07
34	*	0.00	0.000	0.000	0.1970	1.0424	0.0001	8.97E-07
35	*	0.00	0.000	0.000	0.1970	1.0420	0.0001	8.96E-07
36	*	0.00	0.000	0.000	0.1970	1.0416	0.0001	8.96E-07
37	*	0.00	0.000	0.000	0.1970	1.0413	0.0001	8.96E-07
38	*	0.00	0.000	0.000	0.1970	1.0409	0.0001	8.95E-07
39		0.16	0.007	0.016	0.2099	1.0405	0.0001	8.95E-07
40		0.00	0.000	0.013	0.2093	1.0402	0.0001	8.95E-07
41		0.00	0.000	0.009	0.2084	1.0398	0.0001	8.95E-07
42		0.00	0.000	0.009	0.2075	1.0394	0.0001	8.94E-07
43		0.00	0.000	0.009	0.2067	1.0391	0.0001	8.94E-07
44		0.00	0.000	0.009	0.2058	1.0387	0.0001	8.94E-07
45		0.00	0.000	0.009	0.2050	1.0384	0.0001	8.93E-07
46	*	0.00	0.000	0.008	0.2041	1.0380	0.0001	8.93E-07
47	*	0.00	0.000	0.000	0.2041	1.0376	0.0001	8.93E-07
48	*	0.00	0.000	0.008	0.2033	1.0373	0.0001	8.93E-07
49	*	0.12	0.000	0.034	0.2053	1.0369	0.0001	8.92E-07
50	*	0.00	0.000	0.045	0.2073	1.0365	0.0001	8.92E-07
51		0.00	0.000	0.009	0.2064	1.0362	0.0001	8.92E-07
52		0.00	0.000	0.010	0.2055	1.0358	0.0001	8.91E-07
53	*	0.00	0.000	0.000	0.2055	1.0355	0.0001	8.91E-07
54	*	0.00	0.000	0.010	0.2045	1.0351	0.0001	8.91E-07
55	*	0.00	0.000	0.008	0.2038	1.0347	0.0001	8.91E-07
56		0.00	0.000	0.008	0.2030	1.0344	0.0001	8.90E-07

57		0.00	0.000	0.008	0.2023	1.0342	0.0001	8.90E-07
58		0.00	0.000	0.007	0.2015	1.0338	0.0001	8.90E-07
59		0.00	0.000	0.007	0.2008	1.0334	0.0001	8.90E-07
60		0.00	0.000	0.007	0.2001	1.0331	0.0001	8.89E-07
61		0.00	0.000	0.007	0.1994	1.0327	0.0001	8.89E-07
62		0.97	0.418	0.021	0.2152	1.0323	0.0001	8.89E-07
63		0.14	0.130	0.144	0.2268	1.0320	0.0001	8.88E-07
64		0.05	0.000	0.144	0.2303	1.0316	0.0001	8.88E-07
65		0.00	0.000	0.048	0.2256	1.0313	0.0001	8.88E-07
66	*	0.00	0.000	0.050	0.2206	1.0309	0.0001	8.88E-07
67	*	0.00	0.000	0.000	0.2206	1.0305	0.0001	8.87E-07
68		0.00	0.000	0.087	0.2120	1.0302	0.0001	8.87E-07
69		0.39	0.052	0.150	0.2259	1.0298	0.0001	8.87E-07
70		0.00	0.000	0.132	0.2179	1.0295	0.0001	8.86E-07
71		0.00	0.000	0.092	0.2087	1.0291	0.0001	8.86E-07
72		0.00	0.000	0.058	0.2029	1.0287	0.0001	8.86E-07
73		0.00	0.000	0.047	0.1982	1.0284	0.0001	8.86E-07
74		0.00	0.000	0.012	0.1970	1.0280	0.0001	8.85E-07
75		1.08	0.382	0.214	0.2133	1.0277	0.0001	8.85E-07
76		0.27	0.140	0.200	0.2249	1.0273	0.0001	8.85E-07
77		0.00	0.000	0.100	0.2289	1.0269	0.0001	8.84E-07
78		0.00	0.000	0.044	0.2245	1.0266	0.0001	8.84E-07
79		0.00	0.000	0.097	0.2148	1.0262	0.0001	8.84E-07
80		0.61	0.171	0.125	0.2297	1.0259	0.0001	8.84E-07
81		0.00	0.000	0.296	0.2168	1.0255	0.0001	8.83E-07
82		0.00	0.000	0.065	0.2104	1.0251	0.0001	8.83E-07
83		0.49	0.047	0.267	0.2235	1.0248	0.0001	8.83E-07
84		0.00	0.000	0.185	0.2097	1.0244	0.0001	8.82E-07
85		0.13	0.000	0.061	0.2166	1.0241	0.0001	8.82E-07
86		0.83	0.283	0.161	0.2293	1.0237	0.0001	8.82E-07
87		0.16	0.071	0.156	0.2410	1.0233	0.0001	8.82E-07
88		0.00	0.000	0.308	0.2172	1.0231	0.0001	8.81E-07

89		0.00	0.000	0.105	0.2068	1.0229	0.0001	8.81E-07
90		0.00	0.000	0.086	0.1982	1.0225	0.0001	8.81E-07
91		0.00	0.000	0.006	0.1976	1.0222	0.0001	8.81E-07
92		0.34	0.047	0.151	0.2067	1.0220	0.0001	8.80E-07
93		0.19	0.027	0.085	0.2161	1.0216	0.0001	8.80E-07
94		0.06	0.000	0.098	0.2147	1.0212	0.0001	8.80E-07
95	*	0.30	0.000	0.037	0.2166	1.0209	0.0001	8.80E-07
96	*	0.00	0.000	0.027	0.2186	1.0205	0.0001	8.79E-07
97	*	0.02	0.000	0.037	0.2206	1.0202	0.0001	8.79E-07
98	*	0.53	0.000	0.000	0.2226	1.0198	0.0001	8.79E-07
99		0.01	0.231	0.110	0.2353	1.0194	0.0001	8.79E-07
100		0.66	0.274	0.235	0.2470	1.0191	0.0001	8.78E-07
101		0.00	0.017	0.091	0.2586	1.0187	0.0001	8.78E-07
102		0.32	0.076	0.081	0.2702	1.0184	0.0001	8.78E-07
103		0.24	0.042	0.128	0.2804	1.0180	0.0001	8.77E-07
104		0.26	0.048	0.161	0.2860	1.0177	0.0001	8.77E-07
105		0.00	0.000	0.240	0.2653	1.0173	0.0001	8.77E-07
106		0.00	0.000	0.281	0.2373	1.0169	0.0001	8.77E-07
107		0.00	0.000	0.262	0.2111	1.0166	0.0001	8.76E-07
108		0.75	0.223	0.152	0.2273	1.0162	0.0001	8.76E-07
109		0.32	0.028	0.476	0.2273	1.0159	0.0001	8.76E-07
110		0.00	0.000	0.217	0.2084	1.0155	0.0001	8.75E-07
111		0.00	0.000	0.079	0.2005	1.0152	0.0001	8.75E-07
112		0.00	0.000	0.027	0.1978	1.0148	0.0001	8.75E-07
113		0.00	0.000	0.004	0.1974	1.0145	0.0001	8.75E-07
114		0.00	0.000	0.006	0.1972	1.0141	0.0001	8.74E-07
115		0.92	0.366	0.056	0.2134	1.0137	0.0001	8.74E-07
116		0.00	0.000	0.390	0.2077	1.0146	0.0001	8.75E-07
117		0.00	0.000	0.080	0.1997	1.0150	0.0001	8.75E-07
118		0.00	0.000	0.027	0.1970	1.0147	0.0001	8.75E-07
119		0.00	0.000	0.000	0.1970	1.0143	0.0001	8.74E-07
120		0.01	0.000	0.008	0.1970	1.0140	0.0001	8.74E-07

121		0.22	0.035	0.026	0.2091	1.0136	0.0001	8.74E-07
122		0.06	0.000	0.060	0.2126	1.0133	0.0001	8.74E-07
123		0.03	0.000	0.027	0.2132	1.0129	0.0001	8.73E-07
124	*	0.00	0.000	0.013	0.2118	1.0126	0.0001	8.73E-07
125		0.00	0.000	0.016	0.2102	1.0122	0.0001	8.73E-07
126		0.00	0.000	0.017	0.2085	1.0119	0.0001	8.73E-07
127		0.00	0.000	0.016	0.2069	1.0115	0.0001	8.72E-07
128		0.00	0.000	0.016	0.2053	1.0111	0.0001	8.72E-07
129		0.00	0.000	0.015	0.2038	1.0108	0.0001	8.72E-07
130		0.00	0.000	0.015	0.2023	1.0104	0.0001	8.71E-07
131		0.00	0.000	0.015	0.2008	1.0101	0.0001	8.71E-07
132		0.00	0.000	0.014	0.1994	1.0097	0.0001	8.71E-07
133		0.20	0.026	0.025	0.2113	1.0094	0.0001	8.71E-07
134		0.06	0.000	0.052	0.2145	1.0090	0.0001	8.70E-07
135		0.00	0.000	0.015	0.2130	1.0087	0.0001	8.70E-07
136		0.00	0.000	0.014	0.2116	1.0083	0.0001	8.70E-07
137		0.00	0.000	0.013	0.2103	1.0080	0.0001	8.69E-07
138		0.06	0.000	0.023	0.2144	1.0076	0.0001	8.69E-07
139		0.86	0.370	0.029	0.2279	1.0073	0.0001	8.69E-07
140		0.00	0.006	0.200	0.2396	1.0069	0.0001	8.69E-07
141		0.06	0.000	0.265	0.2195	1.0065	0.0001	8.68E-07
142		0.00	0.000	0.213	0.1983	1.0062	0.0001	8.68E-07
143		0.00	0.000	0.007	0.1976	1.0058	0.0001	8.68E-07
144		0.00	0.000	0.003	0.1973	1.0055	0.0001	8.67E-07
145		0.00	0.000	0.003	0.1970	1.0051	0.0001	8.67E-07
146		0.02	0.000	0.013	0.1976	1.0048	0.0001	8.67E-07
147		0.63	0.214	0.045	0.2132	1.0044	0.0001	8.67E-07
148		0.00	0.000	0.190	0.2152	1.0041	0.0001	8.66E-07
149		0.00	0.000	0.071	0.2081	1.0037	0.0001	8.66E-07
150		0.11	0.000	0.076	0.2112	1.0034	0.0001	8.66E-07
151		0.49	0.069	0.218	0.2243	1.0030	0.0001	8.66E-07
152		0.00	0.000	0.181	0.2130	1.0027	0.0001	8.65E-07

153	0.00	0.000	0.110	0.2020	1.0023	0.0001	8.65E-07
154	0.00	0.000	0.047	0.1973	1.0020	0.0001	8.65E-07
155	0.00	0.000	0.002	0.1972	1.0016	0.0001	8.64E-07
156	0.00	0.000	0.001	0.1971	1.0013	0.0001	8.64E-07
157	0.32	0.066	0.050	0.2106	1.0009	0.0001	8.64E-07
158	0.11	0.000	0.092	0.2192	1.0006	0.0001	8.64E-07
159	0.00	0.000	0.116	0.2076	1.0002	0.0001	8.63E-07
160	0.01	0.000	0.029	0.2054	0.9999	0.0001	8.63E-07
161	0.15	0.002	0.031	0.2165	0.9995	0.0001	8.63E-07
162	0.50	0.173	0.043	0.2277	0.9992	0.0001	8.62E-07
163	0.40	0.114	0.234	0.2394	0.9988	0.0001	8.62E-07
164	0.25	0.031	0.290	0.2407	0.9985	0.0001	8.62E-07
165	0.01	0.000	0.260	0.2185	0.9981	0.0001	8.62E-07
166	0.00	0.000	0.186	0.1999	0.9978	0.0001	8.61E-07
167	0.19	0.017	0.092	0.2064	0.9974	0.0001	8.61E-07
168	0.00	0.000	0.085	0.1996	0.9971	0.0001	8.61E-07
169	0.00	0.000	0.022	0.1974	0.9967	0.0001	8.61E-07
170	0.00	0.000	0.004	0.1970	0.9964	0.0001	8.60E-07
171	0.03	0.000	0.015	0.1984	0.9960	0.0001	8.60E-07
172	0.00	0.000	0.004	0.1980	0.9957	0.0001	8.60E-07
173	0.00	0.000	0.007	0.1973	0.9953	0.0001	8.59E-07
174	0.00	0.000	0.002	0.1971	0.9950	0.0001	8.59E-07
175	0.00	0.000	0.001	0.1970	0.9946	0.0001	8.59E-07
176	0.02	0.000	0.012	0.1979	0.9943	0.0001	8.59E-07
177	0.00	0.000	0.003	0.1976	0.9939	0.0001	8.58E-07
178	0.05	0.000	0.016	0.2010	0.9936	0.0001	8.58E-07
179	0.00	0.000	0.003	0.2007	0.9933	0.0001	8.58E-07
180	0.76	0.303	0.035	0.2144	0.9929	0.0001	8.58E-07
181	0.22	0.105	0.178	0.2260	0.9926	0.0001	8.57E-07
182	0.94	0.292	0.445	0.2377	0.9922	0.0001	8.57E-07
183	0.00	0.000	0.266	0.2305	0.9919	0.0001	8.57E-07
184	0.00	0.000	0.244	0.2062	0.9915	0.0001	8.56E-07

185	0.00	0.000	0.082	0.1980	0.9912	0.0001	8.56E-07
186	0.67	0.200	0.120	0.2139	0.9908	0.0001	8.56E-07
187	0.00	0.000	0.243	0.2090	0.9905	0.0001	8.56E-07
188	0.00	0.000	0.083	0.2007	0.9901	0.0001	8.55E-07
189	0.00	0.000	0.033	0.1974	0.9898	0.0001	8.55E-07
190	0.00	0.000	0.004	0.1970	0.9894	0.0001	8.55E-07
191	0.09	0.000	0.017	0.2039	0.9891	0.0001	8.55E-07
192	0.00	0.000	0.021	0.2018	0.9887	0.0001	8.54E-07
193	0.00	0.000	0.027	0.1991	0.9884	0.0001	8.54E-07
194	0.00	0.000	0.011	0.1980	0.9880	0.0001	8.54E-07
195	0.00	0.000	0.008	0.1972	0.9877	0.0001	8.53E-07
196	0.00	0.000	0.002	0.1970	0.9874	0.0001	8.53E-07
197	0.02	0.000	0.013	0.1977	0.9870	0.0001	8.53E-07
198	0.95	0.399	0.040	0.2130	0.9867	0.0001	8.53E-07
199	0.01	0.000	0.351	0.2151	0.9863	0.0001	8.52E-07
200	0.00	0.000	0.117	0.2035	0.9860	0.0001	8.52E-07
201	0.37	0.045	0.200	0.2113	0.9856	0.0001	8.52E-07
202	0.95	0.338	0.255	0.2229	0.9853	0.0001	8.51E-07
203	0.00	0.000	0.249	0.2271	0.9849	0.0001	8.51E-07
204	0.00	0.000	0.125	0.2146	0.9846	0.0001	8.51E-07
205	0.00	0.000	0.141	0.2005	0.9842	0.0001	8.51E-07
206	0.00	0.000	0.027	0.1978	0.9839	0.0001	8.50E-07
207	0.00	0.000	0.004	0.1974	0.9836	0.0001	8.50E-07
208	0.00	0.000	0.002	0.1972	0.9832	0.0001	8.50E-07
209	0.00	0.000	0.002	0.1970	0.9829	0.0001	8.50E-07
210	0.00	0.000	0.000	0.1970	0.9825	0.0001	8.49E-07
211	0.00	0.000	0.000	0.1970	0.9822	0.0001	8.49E-07
212	0.00	0.000	0.000	0.1970	0.9818	0.0001	8.49E-07
213	0.00	0.000	0.000	0.1970	0.9815	0.0001	8.48E-07
214	0.07	0.000	0.015	0.2028	0.9811	0.0001	8.48E-07
215	0.00	0.000	0.015	0.2012	0.9808	0.0001	8.48E-07
216	0.00	0.000	0.023	0.1990	0.9805	0.0001	8.48E-07

217	0.00	0.000	0.009	0.1981	0.9801	0.0001	8.47E-07
218	0.00	0.000	0.007	0.1975	0.9798	0.0001	8.47E-07
219	0.05	0.000	0.016	0.2009	0.9794	0.0001	8.47E-07
220	0.00	0.000	0.003	0.2006	0.9791	0.0001	8.47E-07
221	0.01	0.000	0.017	0.1999	0.9787	0.0001	8.46E-07
222	0.00	0.000	0.007	0.1992	0.9784	0.0001	8.46E-07
223	0.03	0.000	0.017	0.2007	0.9781	0.0001	8.46E-07
224	0.03	0.000	0.014	0.2023	0.9777	0.0001	8.45E-07
225	0.00	0.000	0.012	0.2011	0.9774	0.0001	8.45E-07
226	0.07	0.000	0.025	0.2058	0.9770	0.0001	8.45E-07
227	0.00	0.000	0.016	0.2042	0.9767	0.0001	8.45E-07
228	0.00	0.000	0.015	0.2027	0.9763	0.0001	8.44E-07
229	0.00	0.000	0.017	0.2010	0.9760	0.0001	8.44E-07
230	0.00	0.000	0.018	0.1992	0.9757	0.0001	8.44E-07
231	0.05	0.000	0.029	0.2016	0.9753	0.0001	8.44E-07
232	0.00	0.000	0.012	0.2004	0.9750	0.0001	8.43E-07
233	0.00	0.000	0.012	0.1992	0.9746	0.0001	8.43E-07
234	0.00	0.000	0.006	0.1986	0.9743	0.0001	8.43E-07
235	0.00	0.000	0.006	0.1980	0.9739	0.0001	8.43E-07
236	0.00	0.000	0.004	0.1976	0.9736	0.0001	8.42E-07
237	0.00	0.000	0.004	0.1972	0.9733	0.0001	8.42E-07
238	0.40	0.107	0.033	0.2129	0.9729	0.0001	8.42E-07
239	0.00	0.000	0.117	0.2119	0.9726	0.0001	8.41E-07
240	0.45	0.140	0.030	0.2256	0.9722	0.0001	8.41E-07
241	0.00	0.000	0.162	0.2234	0.9719	0.0001	8.41E-07
242	0.00	0.000	0.102	0.2133	0.9716	0.0001	8.41E-07
243	0.00	0.000	0.128	0.2004	0.9712	0.0001	8.40E-07
244	0.00	0.000	0.027	0.1978	0.9709	0.0001	8.40E-07
245	0.00	0.000	0.006	0.1974	0.9705	0.0001	8.40E-07
246	0.01	0.000	0.015	0.1973	0.9702	0.0001	8.40E-07
247	0.00	0.000	0.003	0.1971	0.9699	0.0001	8.39E-07
248	0.00	0.000	0.000	0.1970	0.9695	0.0001	8.39E-07

249	0.49	0.142	0.045	0.2131	0.9692	0.0001	8.39E-07
250	1.19	0.582	0.153	0.2248	0.9688	0.0001	8.38E-07
251	0.00	0.000	0.396	0.2332	0.9685	0.0001	8.38E-07
252	0.95	0.349	0.218	0.2460	0.9682	0.0001	8.38E-07
253	0.08	0.044	0.133	0.2576	0.9678	0.0001	8.38E-07
254	0.01	0.000	0.279	0.2348	0.9675	0.0001	8.37E-07
255	0.00	0.000	0.206	0.2142	0.9672	0.0001	8.37E-07
256	0.00	0.000	0.145	0.1998	0.9668	0.0001	8.37E-07
257	0.00	0.000	0.020	0.1978	0.9665	0.0001	8.37E-07
258	0.00	0.000	0.006	0.1971	0.9679	0.0001	8.38E-07
259	0.00	0.000	0.001	0.1970	0.9686	0.0001	8.38E-07
260	0.00	0.000	0.000	0.1970	0.9683	0.0001	8.38E-07
261	0.00	0.000	0.000	0.1970	0.9679	0.0001	8.38E-07
262	0.13	0.000	0.015	0.2090	0.9676	0.0001	8.37E-07
263	0.00	0.000	0.013	0.2077	0.9672	0.0001	8.37E-07
264	0.00	0.000	0.016	0.2061	0.9669	0.0001	8.37E-07
265	0.00	0.000	0.018	0.2043	0.9666	0.0001	8.37E-07
266	0.69	0.257	0.037	0.2192	0.9662	0.0001	8.36E-07
267	0.00	0.000	0.149	0.2291	0.9659	0.0001	8.36E-07
268	0.00	0.000	0.045	0.2246	0.9656	0.0001	8.36E-07
269	0.00	0.000	0.064	0.2182	0.9652	0.0001	8.36E-07
270	0.00	0.000	0.085	0.2097	0.9649	0.0001	8.35E-07
271	0.00	0.000	0.092	0.2008	0.9645	0.0001	8.35E-07
272	0.40	0.076	0.110	0.2151	0.9642	0.0001	8.35E-07
273	0.09	0.000	0.133	0.2188	0.9639	0.0001	8.35E-07
274	0.00	0.000	0.065	0.2123	0.9635	0.0001	8.34E-07
275	0.00	0.000	0.125	0.1998	0.9632	0.0001	8.34E-07
276	0.01	0.000	0.034	0.1973	0.9628	0.0001	8.34E-07
277	0.00	0.000	0.002	0.1971	0.9625	0.0001	8.33E-07
278	0.00	0.000	0.001	0.1970	0.9622	0.0001	8.33E-07
279	0.00	0.000	0.000	0.1970	0.9618	0.0001	8.33E-07
280	0.00	0.000	0.000	0.1970	0.9615	0.0001	8.33E-07

281		0.00	0.000	0.000	0.1970	0.9612	0.0001	8.32E-07
282		0.00	0.000	0.000	0.1970	0.9608	0.0001	8.32E-07
283		0.14	0.000	0.020	0.2091	0.9605	0.0001	8.32E-07
284		0.00	0.000	0.011	0.2081	0.9602	0.0001	8.32E-07
285		0.00	0.000	0.012	0.2069	0.9598	0.0001	8.31E-07
286		0.00	0.000	0.015	0.2054	0.9595	0.0001	8.31E-07
287		0.00	0.000	0.015	0.2039	0.9591	0.0001	8.31E-07
288		0.00	0.000	0.014	0.2025	0.9588	0.0001	8.30E-07
289		0.00	0.000	0.013	0.2012	0.9585	0.0001	8.30E-07
290		0.00	0.000	0.013	0.1999	0.9581	0.0001	8.30E-07
291		0.00	0.000	0.012	0.1987	0.9578	0.0001	8.30E-07
292		0.00	0.000	0.010	0.1977	0.9575	0.0001	8.29E-07
293		0.00	0.000	0.006	0.1971	0.9571	0.0001	8.29E-07
294		0.00	0.000	0.001	0.1970	0.9568	0.0001	8.29E-07
295		0.00	0.000	0.000	0.1970	0.9565	0.0001	8.29E-07
296		0.07	0.000	0.014	0.2026	0.9561	0.0001	8.28E-07
297		0.01	0.000	0.011	0.2021	0.9558	0.0001	8.28E-07
298		1.20	0.560	0.028	0.2160	0.9555	0.0001	8.28E-07
299		0.58	0.384	0.182	0.2276	0.9551	0.0001	8.28E-07
300		0.00	0.000	0.393	0.2259	0.9548	0.0001	8.27E-07
301		0.00	0.000	0.104	0.2156	0.9544	0.0001	8.27E-07
302		0.00	0.000	0.056	0.2100	0.9541	0.0001	8.27E-07
303		0.00	0.000	0.064	0.2036	0.9538	0.0001	8.27E-07
304		0.00	0.000	0.058	0.1978	0.9534	0.0001	8.26E-07
305		0.00	0.000	0.004	0.1974	0.9531	0.0001	8.26E-07
306		0.34	0.070	0.062	0.2114	0.9528	0.0001	8.26E-07
307		0.46	0.147	0.119	0.2230	0.9524	0.0001	8.25E-07
308	*	0.11	0.000	0.057	0.2333	0.9521	0.0001	8.25E-07
309		0.00	0.000	0.128	0.2298	0.9518	0.0001	8.25E-07
310		0.28	0.036	0.078	0.2429	0.9514	0.0001	8.25E-07
311	*	0.12	0.000	0.032	0.2455	0.9511	0.0001	8.24E-07
312		0.00	0.000	0.084	0.2468	0.9508	0.0001	8.24E-07

313		0.00	0.000	0.080	0.2388	0.9521	0.0001	8.25E-07
314		0.00	0.000	0.084	0.2304	0.9528	0.0001	8.26E-07
315		0.00	0.000	0.094	0.2209	0.9525	0.0001	8.25E-07
316		0.01	0.000	0.067	0.2151	0.9521	0.0001	8.25E-07
317	*	0.00	0.000	0.037	0.2118	0.9518	0.0001	8.25E-07
318	*	0.08	0.000	0.055	0.2138	0.9515	0.0001	8.25E-07
319	*	0.00	0.000	0.009	0.2138	0.9511	0.0001	8.24E-07
320	*	0.00	0.000	0.045	0.2094	0.9508	0.0001	8.24E-07
321	*	0.00	0.000	0.000	0.2094	0.9505	0.0001	8.24E-07
322	*	0.00	0.000	0.005	0.2094	0.9501	0.0001	8.24E-07
323	*	0.00	0.000	0.000	0.2094	0.9498	0.0001	8.23E-07
324		0.00	0.000	0.048	0.2047	0.9495	0.0001	8.23E-07
325		0.10	0.000	0.077	0.2069	0.9491	0.0001	8.23E-07
326		0.01	0.000	0.059	0.2020	0.9488	0.0001	8.23E-07
327		0.00	0.000	0.036	0.1987	0.9501	0.0001	8.24E-07
328		0.00	0.000	0.014	0.1973	0.9508	0.0001	8.24E-07
329		0.08	0.000	0.022	0.2029	0.9504	0.0001	8.24E-07
330		0.94	0.391	0.063	0.2165	0.9501	0.0001	8.24E-07
331		0.00	0.084	0.066	0.2282	0.9498	0.0001	8.23E-07
332	*	0.00	0.000	0.045	0.2282	0.9494	0.0001	8.23E-07
333	*	0.00	0.000	0.040	0.2280	0.9491	0.0001	8.23E-07
334		0.00	0.000	0.036	0.2245	0.9488	0.0001	8.23E-07
335		0.00	0.000	0.079	0.2166	0.9484	0.0001	8.22E-07
336		0.00	0.000	0.147	0.2019	0.9481	0.0001	8.22E-07
337		0.00	0.000	0.043	0.1976	0.9478	0.0001	8.22E-07
338		0.16	0.004	0.055	0.2078	0.9474	0.0001	8.21E-07
339		0.06	0.000	0.075	0.2066	0.9471	0.0001	8.21E-07
340		0.00	0.000	0.071	0.1995	0.9468	0.0001	8.21E-07
341		0.00	0.000	0.019	0.1976	0.9464	0.0001	8.21E-07
342		0.00	0.000	0.005	0.1971	0.9461	0.0001	8.20E-07
343		0.00	0.000	0.001	0.1970	0.9458	0.0001	8.20E-07
344		0.66	0.223	0.057	0.2133	0.9455	0.0001	8.20E-07

345		0.55	0.260	0.140	0.2250	0.9451	0.0001	8.20E-07
346		0.00	0.002	0.135	0.2366	0.9448	0.0001	8.19E-07
347		0.00	0.000	0.068	0.2300	0.9445	0.0001	8.19E-07
348		0.00	0.000	0.054	0.2246	0.9441	0.0001	8.19E-07
349	*	0.00	0.000	0.033	0.2214	0.9438	0.0001	8.19E-07
350		0.00	0.000	0.059	0.2154	0.9435	0.0001	8.18E-07
351		0.00	0.000	0.047	0.2107	0.9431	0.0001	8.18E-07
352		0.00	0.000	0.049	0.2059	0.9428	0.0001	8.18E-07
353	*	0.00	0.000	0.033	0.2025	0.9425	0.0001	8.18E-07
354		0.00	0.000	0.046	0.1979	0.9421	0.0001	8.17E-07
355		0.00	0.000	0.009	0.1971	0.9418	0.0001	8.17E-07
356		0.07	0.000	0.018	0.2020	0.9415	0.0001	8.17E-07
357		0.21	0.029	0.034	0.2138	0.9412	0.0001	8.16E-07
358	*	0.00	0.000	0.029	0.2138	0.9408	0.0001	8.16E-07
359	*	0.09	0.000	0.014	0.2157	0.9405	0.0001	8.16E-07
360		0.00	0.000	0.060	0.2151	0.9402	0.0001	8.16E-07
361		0.00	0.000	0.028	0.2123	0.9398	0.0001	8.15E-07
362		0.00	0.000	0.049	0.2074	0.9395	0.0001	8.15E-07
363		0.00	0.000	0.048	0.2026	0.9392	0.0001	8.15E-07
364	*	0.09	0.000	0.036	0.2046	0.9388	0.0001	8.15E-07
365	*	0.00	0.000	0.000	0.2066	0.9385	0.0001	8.14E-07

* = Frozen (air or soil)

Annual Totals for Year 11			
	inches	cubic feet	percent
Precipitation	31.87	115,695.9	100.00
Runoff	9.774	35,478.9	30.67
Evapotranspiration	22.357	81,156.0	70.15
Recirculation into Layer 1	0.0411	149.2	0.13
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0411	149.2	0.13
Percolation/Leakage through Layer 5	0.000313	1.1365	0.00
Average Head on Top of Layer 4	0.9932	---	---
Change in Water Storage	-0.2590	-940.1	-0.81
Soil Water at Start of Year	293.6224	1,065,849.2	921.25
Soil Water at End of Year	293.3436	1,064,837.2	920.38
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0198	71.9	0.06
Annual Water Budget Balance	-0.0411	-149.3	-0.13

Daily Output for Year 12

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.075	0.2011	0.9382	0.0001	8.14E-07
2			0.00	0.000	0.025	0.1985	0.9379	0.0001	8.14E-07
3			0.00	0.000	0.014	0.1972	0.9375	0.0001	8.14E-07
4			0.21	0.028	0.042	0.2081	0.9372	0.0001	8.13E-07
5			0.09	0.000	0.088	0.2111	0.9369	0.0001	8.13E-07
6			0.02	0.000	0.046	0.2082	0.9365	0.0001	8.13E-07
7			0.99	0.416	0.064	0.2219	0.9362	0.0001	8.13E-07
8			0.09	0.134	0.080	0.2335	0.9359	0.0001	8.12E-07
9			0.13	0.034	0.083	0.2451	0.9356	0.0001	8.12E-07
10			0.00	0.000	0.080	0.2406	0.9352	0.0001	8.12E-07
11			0.00	0.000	0.086	0.2321	0.9349	0.0001	8.12E-07
12			0.00	0.000	0.054	0.2267	0.9346	0.0001	8.11E-07
13			0.00	0.000	0.065	0.2202	0.9343	0.0001	8.11E-07
14			0.10	0.000	0.065	0.2235	0.9339	0.0001	8.11E-07
15	*		0.02	0.000	0.024	0.2235	0.9336	0.0001	8.10E-07
16			0.22	0.035	0.051	0.2336	0.9333	0.0001	8.10E-07
17			0.00	0.000	0.065	0.2307	0.9329	0.0001	8.10E-07
18			0.00	0.000	0.050	0.2257	0.9326	0.0001	8.10E-07
19			0.00	0.000	0.054	0.2203	0.9323	0.0001	8.09E-07
20	*		0.00	0.000	0.047	0.2156	0.9320	0.0001	8.09E-07
21	*		0.00	0.000	0.038	0.2119	0.9316	0.0001	8.09E-07
22			0.00	0.000	0.042	0.2077	0.9313	0.0001	8.09E-07
23	*		0.00	0.000	0.000	0.2077	0.9310	0.0001	8.08E-07
24	*		0.01	0.000	0.014	0.2077	0.9307	0.0001	8.08E-07

25	*	0.10	0.000	0.055	0.2097	0.9303	0.0001	8.08E-07
26	*	0.00	0.000	0.027	0.2097	0.9300	0.0001	8.08E-07
27	*	0.00	0.000	0.034	0.2063	0.9297	0.0001	8.07E-07
28	*	0.00	0.000	0.039	0.2024	0.9294	0.0001	8.07E-07
29	*	0.11	0.000	0.038	0.2044	0.9290	0.0001	8.07E-07
30		0.01	0.000	0.088	0.2013	0.9287	0.0001	8.07E-07
31		0.02	0.000	0.047	0.1987	0.9284	0.0001	8.06E-07
32		0.32	0.052	0.067	0.2134	0.9281	0.0001	8.06E-07
33		0.00	0.000	0.086	0.2100	0.9279	0.0001	8.06E-07
34		0.00	0.000	0.063	0.2037	0.9277	0.0001	8.06E-07
35		0.00	0.000	0.037	0.2001	0.9274	0.0001	8.06E-07
36		0.00	0.000	0.024	0.1977	0.9271	0.0001	8.05E-07
37		0.00	0.000	0.007	0.1970	0.9267	0.0001	8.05E-07
38		0.00	0.000	0.000	0.1970	0.9264	0.0001	8.05E-07
39		0.20	0.024	0.036	0.2085	0.9261	0.0001	8.05E-07
40		0.00	0.000	0.043	0.2066	0.9258	0.0001	8.04E-07
41		0.00	0.000	0.025	0.2041	0.9254	0.0001	8.04E-07
42		0.00	0.000	0.022	0.2019	0.9251	0.0001	8.04E-07
43	*	0.00	0.000	0.000	0.2019	0.9248	0.0001	8.03E-07
44		0.00	0.000	0.020	0.1999	0.9245	0.0001	8.03E-07
45	*	0.00	0.000	0.016	0.1982	0.9242	0.0001	8.03E-07
46		0.00	0.000	0.010	0.1973	0.9238	0.0001	8.03E-07
47		0.23	0.041	0.025	0.2096	0.9235	0.0001	8.02E-07
48		0.00	0.000	0.051	0.2086	0.9232	0.0001	8.02E-07
49	*	0.01	0.000	0.015	0.2086	0.9229	0.0001	8.02E-07
50	*	0.00	0.000	0.000	0.2087	0.9225	0.0001	8.02E-07
51	*	0.00	0.000	0.000	0.2087	0.9222	0.0001	8.01E-07
52	*	0.00	0.000	0.015	0.2072	0.9219	0.0001	8.01E-07
53		0.00	0.000	0.014	0.2058	0.9216	0.0001	8.01E-07
54	*	0.00	0.000	0.013	0.2045	0.9212	0.0001	8.01E-07
55		0.07	0.000	0.025	0.2090	0.9209	0.0001	8.00E-07
56		0.28	0.065	0.030	0.2214	0.9206	0.0001	8.00E-07

57			0.19	0.030	0.111	0.2301	0.9203	0.0001	8.00E-07
58	*		0.00	0.000	0.030	0.2301	0.9200	0.0001	8.00E-07
59	*		0.00	0.000	0.027	0.2274	0.9196	0.0001	7.99E-07
60	*		0.00	0.000	0.000	0.2274	0.9193	0.0001	7.99E-07
61	*		0.00	0.000	0.000	0.2275	0.9190	0.0001	7.99E-07
62	*		0.00	0.000	0.000	0.2275	0.9187	0.0001	7.99E-07
63	*		0.00	0.000	0.000	0.2275	0.9184	0.0001	7.98E-07
64	*		0.00	0.000	0.000	0.2275	0.9180	0.0001	7.98E-07
65	*	*	0.00	0.000	0.000	0.2275	0.9177	0.0001	7.98E-07
66	*	*	0.00	0.000	0.000	0.2275	0.9174	0.0001	7.98E-07
67	*	*	0.19	0.000	0.069	0.2275	0.9171	0.0001	7.97E-07
68	*	*	0.00	0.000	0.043	0.2275	0.9168	0.0001	7.97E-07
69		*	0.00	0.000	0.078	0.2275	0.9164	0.0001	7.97E-07
70		*	0.00	0.000	0.000	0.2275	0.9161	0.0001	7.97E-07
71		*	0.01	0.000	0.006	0.2278	0.9158	0.0001	7.96E-07
72			0.00	0.000	0.152	0.2126	0.9155	0.0001	7.96E-07
73			0.00	0.000	0.104	0.2022	0.9152	0.0001	7.96E-07
74	*		0.40	0.000	0.038	0.2041	0.9148	0.0001	7.96E-07
75	*	*	0.01	0.000	0.041	0.2042	0.9145	0.0001	7.95E-07
76	*	*	0.00	0.000	0.045	0.2042	0.9142	0.0001	7.95E-07
77		*	0.00	0.086	0.071	0.2085	0.9139	0.0001	7.95E-07
78		*	0.00	0.000	0.065	0.2085	0.9136	0.0001	7.95E-07
79		*	0.01	0.000	0.007	0.2089	0.9132	0.0001	7.94E-07
80			0.00	0.000	0.077	0.2017	0.9129	0.0001	7.94E-07
81			0.31	0.042	0.107	0.2138	0.9126	0.0001	7.94E-07
82			0.23	0.035	0.129	0.2213	0.9123	0.0001	7.93E-07
83			0.00	0.000	0.097	0.2154	0.9120	0.0001	7.93E-07
84			0.00	0.000	0.043	0.2112	0.9116	0.0001	7.93E-07
85			0.35	0.067	0.078	0.2249	0.9113	0.0001	7.93E-07
86	*		0.53	0.000	0.041	0.2272	0.9110	0.0001	7.92E-07
87	*		0.00	0.000	0.041	0.2294	0.9107	0.0001	7.92E-07
88	*		0.00	0.000	0.045	0.2316	0.9104	0.0001	7.92E-07

89	0.00	0.000	0.048	0.2338	0.9100	0.0001	7.92E-07
90	0.00	0.011	0.185	0.2466	0.9097	0.0001	7.91E-07
91	0.00	0.000	0.069	0.2408	0.9094	0.0001	7.91E-07
92	0.00	0.000	0.094	0.2314	0.9091	0.0001	7.91E-07
93	0.03	0.000	0.088	0.2252	0.9088	0.0001	7.91E-07
94	0.26	0.034	0.110	0.2329	0.9084	0.0001	7.90E-07
95	0.00	0.000	0.223	0.2141	0.9081	0.0001	7.90E-07
96	0.01	0.000	0.088	0.2061	0.9078	0.0001	7.90E-07
97	0.44	0.086	0.111	0.2214	0.9075	0.0001	7.90E-07
98	0.20	0.027	0.235	0.2207	0.9072	0.0001	7.89E-07
99	0.00	0.000	0.151	0.2083	0.9069	0.0001	7.89E-07
100	0.00	0.000	0.086	0.1997	0.9065	0.0001	7.89E-07
101	0.00	0.000	0.027	0.1972	0.9062	0.0001	7.89E-07
102	0.87	0.301	0.131	0.2135	0.9059	0.0001	7.88E-07
103	0.17	0.079	0.172	0.2252	0.9056	0.0001	7.88E-07
104	0.41	0.065	0.250	0.2368	0.9053	0.0001	7.88E-07
105	0.00	0.000	0.150	0.2280	0.9049	0.0001	7.88E-07
106	0.00	0.000	0.109	0.2171	0.9046	0.0001	7.87E-07
107	0.02	0.000	0.167	0.2021	0.9043	0.0001	7.87E-07
108	0.69	0.197	0.141	0.2184	0.9040	0.0001	7.87E-07
109	0.44	0.131	0.249	0.2300	0.9037	0.0001	7.87E-07
110	0.27	0.080	0.129	0.2416	0.9034	0.0001	7.86E-07
111	0.00	0.000	0.181	0.2316	0.9030	0.0001	7.86E-07
112	0.00	0.000	0.168	0.2147	0.9027	0.0001	7.86E-07
113	0.00	0.000	0.078	0.2069	0.9024	0.0001	7.86E-07
114	0.00	0.000	0.092	0.1977	0.9021	0.0001	7.85E-07
115	0.00	0.000	0.004	0.1974	0.9018	0.0001	7.85E-07
116	0.00	0.000	0.004	0.1970	0.9015	0.0001	7.85E-07
117	0.00	0.000	0.000	0.1970	0.9011	0.0001	7.85E-07
118	0.00	0.000	0.000	0.1970	0.9008	0.0001	7.84E-07
119	0.21	0.029	0.029	0.2091	0.9005	0.0001	7.84E-07
120	0.40	0.121	0.075	0.2206	0.9002	0.0001	7.84E-07

121		0.00	0.000	0.233	0.2094	0.8999	0.0001	7.84E-07
122		0.09	0.000	0.033	0.2151	0.8996	0.0001	7.83E-07
123		0.11	0.000	0.111	0.2145	0.8993	0.0001	7.83E-07
124		0.14	0.000	0.037	0.2253	0.8989	0.0001	7.83E-07
125		0.00	0.000	0.125	0.2129	0.8986	0.0001	7.83E-07
126		0.00	0.000	0.019	0.2110	0.8983	0.0001	7.82E-07
127		0.00	0.000	0.017	0.2093	0.8980	0.0001	7.82E-07
128	*	0.00	0.000	0.016	0.2077	0.8977	0.0001	7.82E-07
129		0.00	0.000	0.015	0.2062	0.8974	0.0001	7.82E-07
130		0.00	0.000	0.012	0.2050	0.8971	0.0001	7.81E-07
131		0.00	0.000	0.017	0.2033	0.8967	0.0001	7.81E-07
132		0.00	0.000	0.017	0.2016	0.8964	0.0001	7.81E-07
133		0.00	0.000	0.017	0.2000	0.8961	0.0001	7.81E-07
134		0.62	0.215	0.033	0.2160	0.8958	0.0001	7.80E-07
135		0.13	0.000	0.284	0.2219	0.8955	0.0001	7.80E-07
136		0.30	0.030	0.183	0.2272	0.8952	0.0001	7.80E-07
137		0.08	0.000	0.134	0.2247	0.8949	0.0001	7.80E-07
138		0.00	0.000	0.144	0.2103	0.8945	0.0001	7.79E-07
139		0.00	0.000	0.107	0.1996	0.8942	0.0001	7.79E-07
140		0.00	0.000	0.025	0.1972	0.8939	0.0001	7.79E-07
141		0.45	0.110	0.073	0.2132	0.8936	0.0001	7.79E-07
142		0.00	0.000	0.168	0.2075	0.8933	0.0001	7.78E-07
143		0.00	0.000	0.033	0.2042	0.8930	0.0001	7.78E-07
144		0.04	0.000	0.040	0.2043	0.8927	0.0001	7.78E-07
145		0.29	0.057	0.049	0.2170	0.8924	0.0001	7.78E-07
146		0.02	0.000	0.186	0.2061	0.8920	0.0001	7.77E-07
147		0.02	0.000	0.032	0.2047	0.8917	0.0001	7.77E-07
148		0.00	0.000	0.025	0.2022	0.8914	0.0001	7.77E-07
149		0.00	0.000	0.022	0.2000	0.8911	0.0001	7.77E-07
150		0.00	0.000	0.024	0.1977	0.8908	0.0001	7.76E-07
151		0.00	0.000	0.006	0.1971	0.8905	0.0001	7.76E-07
152		0.11	0.000	0.015	0.2069	0.8902	0.0001	7.76E-07

153	0.06	0.000	0.023	0.2104	0.8899	0.0001	7.76E-07
154	0.10	0.000	0.025	0.2180	0.8895	0.0001	7.75E-07
155	0.05	0.000	0.024	0.2204	0.8892	0.0001	7.75E-07
156	0.15	0.003	0.027	0.2317	0.8889	0.0001	7.75E-07
157	0.00	0.000	0.107	0.2213	0.8886	0.0001	7.75E-07
158	0.00	0.000	0.014	0.2199	0.8883	0.0001	7.74E-07
159	0.00	0.000	0.016	0.2182	0.8880	0.0001	7.74E-07
160	0.00	0.000	0.014	0.2169	0.8877	0.0001	7.74E-07
161	0.00	0.000	0.014	0.2156	0.8874	0.0001	7.74E-07
162	0.00	0.000	0.015	0.2141	0.8871	0.0001	7.73E-07
163	0.00	0.000	0.014	0.2127	0.8867	0.0001	7.73E-07
164	0.00	0.000	0.013	0.2114	0.8864	0.0001	7.73E-07
165	0.00	0.000	0.012	0.2101	0.8861	0.0001	7.73E-07
166	1.04	0.456	0.032	0.2258	0.8858	0.0001	7.72E-07
167	0.00	0.000	0.361	0.2297	0.8855	0.0001	7.72E-07
168	0.00	0.000	0.215	0.2082	0.8852	0.0001	7.72E-07
169	0.00	0.000	0.090	0.1992	0.8849	0.0001	7.72E-07
170	0.09	0.000	0.056	0.2027	0.8846	0.0001	7.71E-07
171	0.06	0.000	0.056	0.2031	0.8843	0.0001	7.71E-07
172	0.70	0.256	0.075	0.2155	0.8840	0.0001	7.71E-07
173	0.00	0.000	0.190	0.2211	0.8836	0.0001	7.71E-07
174	0.00	0.000	0.157	0.2054	0.8835	0.0001	7.71E-07
175	0.00	0.000	0.063	0.1990	0.8834	0.0001	7.70E-07
176	0.00	0.000	0.019	0.1971	0.8830	0.0001	7.70E-07
177	0.00	0.000	0.001	0.1971	0.8827	0.0001	7.70E-07
178	0.00	0.000	0.001	0.1970	0.8824	0.0001	7.70E-07
179	0.19	0.020	0.032	0.2089	0.8821	0.0001	7.69E-07
180	0.12	0.000	0.049	0.2176	0.8818	0.0001	7.69E-07
181	0.00	0.000	0.016	0.2160	0.8815	0.0001	7.69E-07
182	0.00	0.000	0.024	0.2136	0.8812	0.0001	7.69E-07
183	0.00	0.000	0.022	0.2114	0.8809	0.0001	7.68E-07
184	0.00	0.000	0.022	0.2093	0.8806	0.0001	7.68E-07

185	0.00	0.000	0.022	0.2071	0.8803	0.0001	7.68E-07
186	0.00	0.000	0.019	0.2052	0.8800	0.0001	7.68E-07
187	0.00	0.000	0.021	0.2032	0.8796	0.0001	7.67E-07
188	0.00	0.000	0.018	0.2014	0.8793	0.0001	7.67E-07
189	0.00	0.000	0.017	0.1997	0.8790	0.0001	7.67E-07
190	0.00	0.000	0.020	0.1977	0.8787	0.0001	7.67E-07
191	0.00	0.000	0.007	0.1970	0.8784	0.0001	7.66E-07
192	0.41	0.108	0.034	0.2130	0.8781	0.0001	7.66E-07
193	0.00	0.000	0.202	0.2037	0.8778	0.0001	7.66E-07
194	0.00	0.000	0.016	0.2020	0.8775	0.0001	7.66E-07
195	0.00	0.000	0.018	0.2003	0.8772	0.0001	7.65E-07
196	0.00	0.000	0.017	0.1986	0.8769	0.0001	7.65E-07
197	0.00	0.000	0.016	0.1970	0.8766	0.0001	7.65E-07
198	0.04	0.000	0.014	0.1992	0.8763	0.0001	7.65E-07
199	0.00	0.000	0.002	0.1990	0.8760	0.0001	7.65E-07
200	0.05	0.000	0.018	0.2020	0.8756	0.0001	7.64E-07
201	0.00	0.000	0.010	0.2011	0.8753	0.0001	7.64E-07
202	0.00	0.000	0.011	0.2000	0.8750	0.0001	7.64E-07
203	0.00	0.000	0.013	0.1988	0.8747	0.0001	7.64E-07
204	0.00	0.000	0.005	0.1983	0.8744	0.0001	7.63E-07
205	0.00	0.000	0.005	0.1978	0.8741	0.0001	7.63E-07
206	0.00	0.000	0.004	0.1974	0.8738	0.0001	7.63E-07
207	0.00	0.000	0.003	0.1971	0.8735	0.0001	7.63E-07
208	0.00	0.000	0.001	0.1970	0.8732	0.0001	7.62E-07
209	0.00	0.000	0.000	0.1970	0.8729	0.0001	7.62E-07
210	0.00	0.000	0.000	0.1970	0.8726	0.0001	7.62E-07
211	0.00	0.000	0.000	0.1970	0.8723	0.0001	7.62E-07
212	0.00	0.000	0.000	0.1970	0.8720	0.0001	7.61E-07
213	0.00	0.000	0.000	0.1970	0.8717	0.0001	7.61E-07
214	0.15	0.000	0.024	0.2095	0.8714	0.0001	7.61E-07
215	0.00	0.000	0.009	0.2085	0.8711	0.0001	7.61E-07
216	0.00	0.000	0.013	0.2072	0.8708	0.0001	7.60E-07

217	0.00	0.000	0.014	0.2058	0.8704	0.0001	7.60E-07
218	0.08	0.000	0.031	0.2107	0.8701	0.0001	7.60E-07
219	0.00	0.000	0.012	0.2095	0.8698	0.0001	7.60E-07
220	0.00	0.000	0.009	0.2087	0.8695	0.0001	7.59E-07
221	0.00	0.000	0.015	0.2072	0.8692	0.0001	7.59E-07
222	0.00	0.000	0.015	0.2057	0.8689	0.0001	7.59E-07
223	0.04	0.000	0.025	0.2068	0.8686	0.0001	7.59E-07
224	0.00	0.000	0.020	0.2048	0.8683	0.0001	7.58E-07
225	0.00	0.000	0.016	0.2032	0.8680	0.0001	7.58E-07
226	0.13	0.000	0.029	0.2131	0.8677	0.0001	7.58E-07
227	0.21	0.038	0.026	0.2243	0.8674	0.0001	7.58E-07
228	0.00	0.000	0.052	0.2229	0.8671	0.0001	7.57E-07
229	0.03	0.000	0.024	0.2238	0.8668	0.0001	7.57E-07
230	0.26	0.054	0.029	0.2360	0.8665	0.0001	7.57E-07
231	0.00	0.000	0.140	0.2274	0.8662	0.0001	7.57E-07
232	0.18	0.011	0.112	0.2320	0.8659	0.0001	7.56E-07
233	0.00	0.000	0.216	0.2116	0.8656	0.0001	7.56E-07
234	0.14	0.000	0.083	0.2173	0.8653	0.0001	7.56E-07
235	0.81	0.320	0.078	0.2295	0.8650	0.0001	7.56E-07
236	0.03	0.000	0.291	0.2330	0.8647	0.0001	7.55E-07
237	0.00	0.000	0.182	0.2148	0.8648	0.0001	7.56E-07
238	0.00	0.000	0.154	0.1995	0.8647	0.0001	7.56E-07
239	0.00	0.000	0.024	0.1973	0.8644	0.0001	7.55E-07
240	0.00	0.000	0.002	0.1972	0.8641	0.0001	7.55E-07
241	0.00	0.000	0.002	0.1970	0.8638	0.0001	7.55E-07
242	0.90	0.347	0.080	0.2127	0.8635	0.0001	7.55E-07
243	0.00	0.000	0.349	0.2095	0.8632	0.0001	7.54E-07
244	0.00	0.000	0.101	0.1995	0.8629	0.0001	7.54E-07
245	0.00	0.000	0.025	0.1970	0.8626	0.0001	7.54E-07
246	0.20	0.020	0.083	0.2049	0.8623	0.0001	7.54E-07
247	0.03	0.000	0.060	0.2041	0.8620	0.0001	7.53E-07
248	0.01	0.000	0.047	0.2008	0.8617	0.0001	7.53E-07

249	0.46	0.136	0.058	0.2140	0.8614	0.0001	7.53E-07
250	0.09	0.000	0.178	0.2191	0.8611	0.0001	7.53E-07
251	0.00	0.000	0.066	0.2125	0.8608	0.0001	7.52E-07
252	0.00	0.000	0.080	0.2045	0.8605	0.0001	7.52E-07
253	0.00	0.000	0.071	0.1974	0.8602	0.0001	7.52E-07
254	0.00	0.000	0.003	0.1971	0.8599	0.0001	7.52E-07
255	0.00	0.000	0.000	0.1970	0.8596	0.0001	7.51E-07
256	0.00	0.000	0.000	0.1970	0.8593	0.0001	7.51E-07
257	0.00	0.000	0.000	0.1970	0.8590	0.0001	7.51E-07
258	0.00	0.000	0.000	0.1970	0.8587	0.0001	7.51E-07
259	0.00	0.000	0.000	0.1970	0.8584	0.0001	7.50E-07
260	0.00	0.000	0.000	0.1970	0.8581	0.0001	7.50E-07
261	0.31	0.067	0.040	0.2106	0.8578	0.0001	7.50E-07
262	0.00	0.000	0.077	0.2096	0.8575	0.0001	7.50E-07
263	0.00	0.000	0.016	0.2080	0.8572	0.0001	7.49E-07
264	0.60	0.209	0.036	0.2226	0.8569	0.0001	7.49E-07
265	0.02	0.000	0.121	0.2326	0.8566	0.0001	7.49E-07
266	0.00	0.000	0.083	0.2243	0.8563	0.0001	7.49E-07
267	0.00	0.000	0.113	0.2131	0.8560	0.0001	7.49E-07
268	0.00	0.000	0.140	0.1991	0.8557	0.0001	7.48E-07
269	0.00	0.000	0.015	0.1976	0.8554	0.0001	7.48E-07
270	0.00	0.000	0.003	0.1973	0.8551	0.0001	7.48E-07
271	0.00	0.000	0.003	0.1970	0.8548	0.0001	7.48E-07
272	0.00	0.000	0.000	0.1970	0.8545	0.0001	7.47E-07
273	0.00	0.000	0.000	0.1970	0.8542	0.0001	7.47E-07
274	0.00	0.000	0.000	0.1970	0.8539	0.0001	7.47E-07
275	0.00	0.000	0.000	0.1970	0.8536	0.0001	7.47E-07
276	0.00	0.000	0.000	0.1970	0.8533	0.0001	7.46E-07
277	0.00	0.000	0.000	0.1970	0.8530	0.0001	7.46E-07
278	0.05	0.000	0.016	0.2002	0.8527	0.0001	7.46E-07
279	0.00	0.000	0.002	0.2000	0.8524	0.0001	7.46E-07
280	0.00	0.000	0.008	0.1992	0.8521	0.0001	7.45E-07

281	0.00	0.000	0.004	0.1988	0.8518	0.0001	7.45E-07
282	0.00	0.000	0.004	0.1984	0.8515	0.0001	7.45E-07
283	0.00	0.000	0.003	0.1981	0.8512	0.0001	7.45E-07
284	0.00	0.000	0.003	0.1978	0.8509	0.0001	7.44E-07
285	0.00	0.000	0.003	0.1975	0.8506	0.0001	7.44E-07
286	0.00	0.000	0.003	0.1972	0.8503	0.0001	7.44E-07
287	0.00	0.000	0.001	0.1971	0.8500	0.0001	7.44E-07
288	0.09	0.000	0.016	0.2045	0.8497	0.0001	7.44E-07
289	0.04	0.000	0.020	0.2060	0.8494	0.0001	7.43E-07
290	0.13	0.000	0.022	0.2170	0.8491	0.0001	7.43E-07
291	0.01	0.000	0.012	0.2165	0.8488	0.0001	7.43E-07
292	0.07	0.000	0.024	0.2207	0.8485	0.0001	7.43E-07
293	0.04	0.000	0.025	0.2219	0.8482	0.0001	7.42E-07
294	0.00	0.000	0.010	0.2209	0.8479	0.0001	7.42E-07
295	0.00	0.000	0.009	0.2200	0.8476	0.0001	7.42E-07
296	0.00	0.000	0.009	0.2191	0.8473	0.0001	7.42E-07
297	0.00	0.000	0.009	0.2182	0.8470	0.0001	7.41E-07
298	0.00	0.000	0.009	0.2173	0.8468	0.0001	7.41E-07
299	0.00	0.000	0.009	0.2165	0.8465	0.0001	7.41E-07
300	0.00	0.000	0.008	0.2156	0.8462	0.0001	7.41E-07
301	0.00	0.000	0.008	0.2148	0.8459	0.0001	7.40E-07
302	0.00	0.000	0.008	0.2140	0.8456	0.0001	7.40E-07
303	0.00	0.000	0.008	0.2132	0.8453	0.0001	7.40E-07
304	0.01	0.000	0.016	0.2127	0.8450	0.0001	7.40E-07
305	0.00	0.000	0.008	0.2120	0.8447	0.0001	7.39E-07
306	0.00	0.000	0.008	0.2112	0.8444	0.0001	7.39E-07
307	0.04	0.000	0.022	0.2134	0.8441	0.0001	7.39E-07
308	0.63	0.243	0.026	0.2262	0.8438	0.0001	7.39E-07
309	2.66	1.629	0.169	0.2378	0.8435	0.0001	7.39E-07
310	0.02	0.398	0.086	0.2494	0.8432	0.0001	7.38E-07
311	0.01	0.063	0.170	0.2611	0.8429	0.0001	7.38E-07
312	0.03	0.000	0.214	0.2490	0.8426	0.0001	7.38E-07

313		0.00	0.000	0.188	0.2307	0.8423	0.0001	7.38E-07
314		0.00	0.000	0.129	0.2178	0.8420	0.0001	7.37E-07
315		0.00	0.000	0.165	0.2013	0.8417	0.0001	7.37E-07
316		0.00	0.000	0.031	0.1981	0.8414	0.0001	7.37E-07
317		0.00	0.000	0.010	0.1970	0.8446	0.0001	7.39E-07
318		0.00	0.000	0.000	0.1970	0.8465	0.0001	7.41E-07
319		0.00	0.000	0.000	0.1970	0.8462	0.0001	7.41E-07
320		0.00	0.000	0.000	0.1970	0.8459	0.0001	7.40E-07
321		0.00	0.000	0.000	0.1970	0.8456	0.0001	7.40E-07
322		0.01	0.000	0.007	0.1970	0.8453	0.0001	7.40E-07
323		0.00	0.000	0.003	0.1970	0.8450	0.0001	7.40E-07
324		0.00	0.000	0.000	0.1970	0.8447	0.0001	7.39E-07
325		0.00	0.000	0.000	0.1970	0.8444	0.0001	7.39E-07
326	*	0.00	0.000	0.000	0.1970	0.8441	0.0001	7.39E-07
327	*	0.12	0.000	0.056	0.1990	0.8438	0.0001	7.39E-07
328		0.67	0.291	0.000	0.2133	0.8435	0.0001	7.39E-07
329	*	0.19	0.059	0.006	0.2250	0.8432	0.0001	7.38E-07
330	*	0.81	0.000	0.037	0.2270	0.8429	0.0001	7.38E-07
331		0.05	0.164	0.000	0.2397	0.8426	0.0001	7.38E-07
332		0.07	0.306	0.000	0.2513	0.8423	0.0001	7.38E-07
333		0.01	0.157	0.047	0.2630	0.8420	0.0001	7.37E-07
334		0.37	0.105	0.197	0.2746	0.8417	0.0001	7.37E-07
335		0.00	0.000	0.165	0.2669	0.8414	0.0001	7.37E-07
336		0.02	0.000	0.111	0.2578	0.8411	0.0001	7.37E-07
337		0.08	0.000	0.106	0.2555	0.8408	0.0001	7.36E-07
338		0.02	0.000	0.103	0.2474	0.8405	0.0001	7.36E-07
339		0.00	0.000	0.114	0.2360	0.8402	0.0001	7.36E-07
340		0.00	0.000	0.056	0.2304	0.8400	0.0001	7.36E-07
341	*	0.00	0.000	0.036	0.2268	0.8397	0.0001	7.35E-07
342	*	0.00	0.000	0.000	0.2268	0.8394	0.0001	7.35E-07
343	*	0.00	0.000	0.004	0.2268	0.8391	0.0001	7.35E-07
344	*	0.00	0.000	0.037	0.2232	0.8388	0.0001	7.35E-07

345		0.00	0.000	0.068	0.2164	0.8385	0.0001	7.34E-07
346		0.00	0.000	0.131	0.2033	0.8382	0.0001	7.34E-07
347		0.00	0.000	0.053	0.1980	0.8379	0.0001	7.34E-07
348		0.00	0.000	0.010	0.1970	0.8376	0.0001	7.34E-07
349		0.00	0.000	0.000	0.1970	0.8373	0.0001	7.34E-07
350		0.00	0.000	0.000	0.1970	0.8370	0.0001	7.33E-07
351		0.16	0.005	0.028	0.2093	0.8367	0.0001	7.33E-07
352		0.00	0.000	0.017	0.2080	0.8364	0.0001	7.33E-07
353		0.00	0.000	0.019	0.2062	0.8361	0.0001	7.33E-07
354		0.15	0.009	0.031	0.2166	0.8358	0.0001	7.32E-07
355		0.36	0.103	0.047	0.2283	0.8355	0.0001	7.32E-07
356		0.00	0.000	0.108	0.2278	0.8353	0.0001	7.32E-07
357		0.00	0.000	0.067	0.2211	0.8350	0.0001	7.32E-07
358		0.00	0.000	0.076	0.2135	0.8347	0.0001	7.31E-07
359		0.00	0.000	0.067	0.2067	0.8344	0.0001	7.31E-07
360		0.00	0.000	0.048	0.2020	0.8341	0.0001	7.31E-07
361		0.00	0.000	0.041	0.1979	0.8338	0.0001	7.31E-07
362		0.00	0.000	0.008	0.1972	0.8335	0.0001	7.30E-07
363	*	0.00	0.000	0.003	0.1970	0.8332	0.0001	7.30E-07
364		0.00	0.000	0.000	0.1970	0.8329	0.0001	7.30E-07
365		0.00	0.000	0.000	0.1970	0.8326	0.0001	7.30E-07

* = Frozen (air or soil)

Annual Totals for Year 12			
	inches	cubic feet	percent
Precipitation	26.96	97,877.9	100.00
Runoff	8.240	29,910.9	30.56
Evapotranspiration	18.873	68,510.5	70.00
Recirculation into Layer 1	0.0366	132.9	0.14
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0366	132.9	0.14
Percolation/Leakage through Layer 5	0.000282	1.0222	0.00
Average Head on Top of Layer 4	0.8821	---	---
Change in Water Storage	-0.1500	-544.4	-0.56
Soil Water at Start of Year	293.3436	1,064,837.2	1087.92
Soil Water at End of Year	293.2134	1,064,364.7	1087.44
Snow Water at Start of Year	0.0198	71.9	0.07
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0366	-132.9	-0.14

Daily Output for Year 13

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.000	0.1970	0.8320	0.0001	7.29E-07
2	*		0.00	0.000	0.000	0.1970	0.8317	0.0001	7.29E-07
3	*		0.00	0.000	0.000	0.1970	0.8315	0.0001	7.29E-07
4			0.00	0.000	0.000	0.1970	0.8312	0.0001	7.29E-07
5	*		0.00	0.000	0.000	0.1970	0.8309	0.0001	7.28E-07
6			0.00	0.000	0.000	0.1970	0.8306	0.0001	7.28E-07
7			0.22	0.037	0.022	0.2097	0.8303	0.0001	7.28E-07
8			0.29	0.071	0.070	0.2214	0.8300	0.0001	7.28E-07
9			0.64	0.259	0.103	0.2330	0.8297	0.0001	7.27E-07
10			0.03	0.031	0.091	0.2446	0.8294	0.0001	7.27E-07
11			0.16	0.011	0.081	0.2531	0.8292	0.0001	7.27E-07
12			0.24	0.037	0.105	0.2609	0.8289	0.0001	7.27E-07
13			0.16	0.016	0.077	0.2700	0.8286	0.0001	7.27E-07
14			0.00	0.000	0.085	0.2630	0.8283	0.0001	7.26E-07
15			0.00	0.000	0.081	0.2549	0.8280	0.0001	7.26E-07
16			0.10	0.000	0.083	0.2561	0.8277	0.0001	7.26E-07
17			0.00	0.000	0.135	0.2429	0.8275	0.0001	7.26E-07
18			0.20	0.024	0.106	0.2476	0.8272	0.0001	7.25E-07
19			0.00	0.000	0.117	0.2383	0.8269	0.0001	7.25E-07
20			0.00	0.000	0.084	0.2299	0.8266	0.0001	7.25E-07
21			0.00	0.000	0.075	0.2224	0.8263	0.0001	7.25E-07
22	*		0.00	0.000	0.000	0.2224	0.8260	0.0001	7.24E-07
23	*		0.00	0.000	0.000	0.2224	0.8257	0.0001	7.24E-07
24			0.00	0.000	0.058	0.2167	0.8254	0.0001	7.24E-07

25			0.00	0.000	0.064	0.2103	0.8251	0.0001	7.24E-07
26			0.08	0.000	0.070	0.2114	0.8248	0.0001	7.24E-07
27	*		0.00	0.000	0.000	0.2114	0.8246	0.0001	7.23E-07
28	*		0.00	0.000	0.000	0.2114	0.8243	0.0001	7.23E-07
29	*		0.00	0.000	0.000	0.2115	0.8240	0.0001	7.23E-07
30			0.00	0.000	0.050	0.2065	0.8237	0.0001	7.23E-07
31	*		0.47	0.000	0.024	0.2084	0.8234	0.0001	7.22E-07
32	*		0.01	0.000	0.013	0.2104	0.8231	0.0001	7.22E-07
33	*		0.00	0.000	0.017	0.2124	0.8228	0.0001	7.22E-07
34	*		0.00	0.000	0.020	0.2144	0.8225	0.0001	7.22E-07
35	*		0.00	0.000	0.009	0.2164	0.8223	0.0001	7.21E-07
36	*		0.00	0.000	0.022	0.2183	0.8220	0.0001	7.21E-07
37	*		0.00	0.000	0.028	0.2203	0.8217	0.0001	7.21E-07
38	*		0.00	0.000	0.027	0.2223	0.8214	0.0001	7.21E-07
39	*		0.01	0.000	0.031	0.2243	0.8211	0.0001	7.21E-07
40	*		0.21	0.000	0.000	0.2262	0.8208	0.0001	7.20E-07
41			0.08	0.116	0.036	0.2390	0.8205	0.0001	7.20E-07
42			0.22	0.053	0.111	0.2506	0.8202	0.0001	7.20E-07
43	*		0.00	0.000	0.047	0.2506	0.8199	0.0001	7.20E-07
44	*	*	0.01	0.000	0.016	0.2506	0.8197	0.0001	7.19E-07
45	*	*	0.00	0.000	0.000	0.2507	0.8194	0.0001	7.19E-07
46	*	*	0.00	0.000	0.000	0.2507	0.8191	0.0001	7.19E-07
47		*	0.00	0.000	0.000	0.2507	0.8188	0.0001	7.19E-07
48		*	0.00	0.000	0.000	0.2507	0.8185	0.0001	7.18E-07
49		*	0.00	0.000	0.000	0.2507	0.8182	0.0001	7.18E-07
50			0.00	0.000	0.114	0.2393	0.8179	0.0001	7.18E-07
51			0.00	0.000	0.085	0.2307	0.8177	0.0001	7.18E-07
52			0.00	0.000	0.130	0.2178	0.8174	0.0001	7.18E-07
53			0.00	0.000	0.058	0.2119	0.8176	0.0001	7.18E-07
54			1.57	0.716	0.145	0.2282	0.8188	0.0001	7.19E-07
55			0.72	0.557	0.063	0.2398	0.8185	0.0001	7.18E-07
56			0.30	0.271	0.178	0.2515	0.8182	0.0001	7.18E-07

57		0.00	0.006	0.142	0.2631	0.8179	0.0001	7.18E-07
58		0.00	0.000	0.098	0.2539	0.8176	0.0001	7.18E-07
59		0.00	0.000	0.077	0.2462	0.8174	0.0001	7.18E-07
60		0.65	0.214	0.095	0.2607	0.8171	0.0001	7.17E-07
61		0.32	0.093	0.215	0.2723	0.8168	0.0001	7.17E-07
62		0.50	0.206	0.124	0.2839	0.8165	0.0001	7.17E-07
63		0.00	0.000	0.152	0.2834	0.8162	0.0001	7.17E-07
64		0.00	0.000	0.124	0.2710	0.8159	0.0001	7.16E-07
65		0.00	0.000	0.113	0.2597	0.8156	0.0001	7.16E-07
66		0.00	0.000	0.099	0.2499	0.8154	0.0001	7.16E-07
67	*	0.00	0.000	0.000	0.2499	0.8151	0.0001	7.16E-07
68		0.00	0.000	0.070	0.2432	0.8148	0.0001	7.15E-07
69	*	0.05	0.000	0.087	0.2395	0.8145	0.0001	7.15E-07
70		0.00	0.000	0.097	0.2299	0.8142	0.0001	7.15E-07
71	*	0.03	0.000	0.031	0.2299	0.8139	0.0001	7.15E-07
72		0.13	0.000	0.154	0.2277	0.8136	0.0001	7.15E-07
73		0.00	0.000	0.058	0.2219	0.8134	0.0001	7.14E-07
74		0.00	0.000	0.094	0.2125	0.8131	0.0001	7.14E-07
75		0.00	0.000	0.044	0.2081	0.8128	0.0001	7.14E-07
76		0.00	0.000	0.058	0.2023	0.8125	0.0001	7.14E-07
77		0.00	0.000	0.038	0.1986	0.8122	0.0001	7.13E-07
78		0.00	0.000	0.016	0.1970	0.8119	0.0001	7.13E-07
79		0.48	0.137	0.047	0.2133	0.8117	0.0001	7.13E-07
80		0.00	0.000	0.127	0.2144	0.8114	0.0001	7.13E-07
81		0.00	0.000	0.057	0.2086	0.8111	0.0001	7.12E-07
82		0.00	0.000	0.038	0.2049	0.8108	0.0001	7.12E-07
83		0.00	0.000	0.037	0.2012	0.8105	0.0001	7.12E-07
84		0.00	0.000	0.032	0.1980	0.8102	0.0001	7.12E-07
85		0.00	0.000	0.010	0.1970	0.8099	0.0001	7.12E-07
86		1.07	0.456	0.058	0.2133	0.8097	0.0001	7.11E-07
87		0.69	0.387	0.208	0.2249	0.8094	0.0001	7.11E-07
88		0.10	0.065	0.228	0.2365	0.8091	0.0001	7.11E-07

89		0.00	0.000	0.205	0.2225	0.8088	0.0001	7.11E-07
90		0.00	0.000	0.097	0.2128	0.8085	0.0001	7.10E-07
91		0.10	0.000	0.154	0.2078	0.8082	0.0001	7.10E-07
92		0.15	0.000	0.113	0.2119	0.8080	0.0001	7.10E-07
93		0.00	0.000	0.053	0.2067	0.8077	0.0001	7.10E-07
94	*	0.00	0.000	0.000	0.2067	0.8074	0.0001	7.10E-07
95	*	0.00	0.000	0.060	0.2006	0.8078	0.0001	7.10E-07
96	*	0.00	0.000	0.023	0.1984	0.8079	0.0001	7.10E-07
97	*	0.01	0.000	0.028	0.1970	0.8076	0.0001	7.10E-07
98		0.00	0.000	0.002	0.1970	0.8073	0.0001	7.09E-07
99		0.00	0.000	0.000	0.1970	0.8070	0.0001	7.09E-07
100		0.00	0.000	0.000	0.1970	0.8067	0.0001	7.09E-07
101		0.00	0.000	0.000	0.1970	0.8065	0.0001	7.09E-07
102		0.36	0.084	0.047	0.2118	0.8062	0.0001	7.09E-07
103		0.51	0.177	0.128	0.2235	0.8059	0.0001	7.08E-07
104		0.00	0.000	0.174	0.2237	0.8056	0.0001	7.08E-07
105	*	0.00	0.000	0.063	0.2174	0.8053	0.0001	7.08E-07
106		0.00	0.000	0.039	0.2134	0.8050	0.0001	7.08E-07
107		0.00	0.000	0.074	0.2060	0.8048	0.0001	7.07E-07
108		1.46	0.683	0.067	0.2223	0.8045	0.0001	7.07E-07
109		1.04	0.738	0.076	0.2339	0.8042	0.0001	7.07E-07
110		0.00	0.170	0.198	0.2455	0.8039	0.0001	7.07E-07
111		0.00	0.000	0.285	0.2340	0.8036	0.0001	7.06E-07
112		0.00	0.000	0.100	0.2240	0.8034	0.0001	7.06E-07
113		0.00	0.000	0.148	0.2093	0.8031	0.0001	7.06E-07
114		0.05	0.000	0.121	0.2023	0.8028	0.0001	7.06E-07
115		0.00	0.000	0.036	0.1987	0.8025	0.0001	7.06E-07
116		0.00	0.000	0.013	0.1974	0.8022	0.0001	7.05E-07
117		0.00	0.000	0.003	0.1971	0.8020	0.0001	7.05E-07
118		0.00	0.000	0.001	0.1970	0.8017	0.0001	7.05E-07
119	*	0.00	0.000	0.000	0.1970	0.8014	0.0001	7.05E-07
120	*	0.00	0.000	0.000	0.1970	0.8011	0.0001	7.04E-07

121	*	0.10	0.000	0.101	0.1970	0.8008	0.0001	7.04E-07
122		0.34	0.077	0.044	0.2114	0.8006	0.0001	7.04E-07
123		0.00	0.000	0.089	0.2102	0.8003	0.0001	7.04E-07
124		0.02	0.000	0.029	0.2095	0.8000	0.0001	7.04E-07
125		0.00	0.000	0.017	0.2078	0.7997	0.0001	7.03E-07
126		0.00	0.000	0.018	0.2060	0.7994	0.0001	7.03E-07
127		0.00	0.000	0.017	0.2043	0.7992	0.0001	7.03E-07
128		0.00	0.000	0.017	0.2027	0.7989	0.0001	7.03E-07
129		0.95	0.398	0.035	0.2180	0.7986	0.0001	7.02E-07
130		0.00	0.000	0.431	0.2110	0.7983	0.0001	7.02E-07
131		0.00	0.000	0.102	0.2008	0.7980	0.0001	7.02E-07
132		0.00	0.000	0.038	0.1970	0.7978	0.0001	7.02E-07
133		0.00	0.000	0.000	0.1970	0.7975	0.0001	7.02E-07
134		0.00	0.000	0.000	0.1970	0.7972	0.0001	7.01E-07
135		0.00	0.000	0.000	0.1970	0.7969	0.0001	7.01E-07
136		0.00	0.000	0.000	0.1970	0.7966	0.0001	7.01E-07
137		1.04	0.438	0.048	0.2132	0.7964	0.0001	7.01E-07
138		0.28	0.076	0.399	0.2249	0.7961	0.0001	7.00E-07
139		2.88	1.743	0.167	0.2365	0.7958	0.0001	7.00E-07
140		0.64	0.648	0.191	0.2481	0.7955	0.0001	7.00E-07
141		0.83	0.509	0.423	0.2597	0.7952	0.0001	7.00E-07
142		0.19	0.073	0.316	0.2714	0.7950	0.0001	7.00E-07
143		1.00	0.451	0.293	0.2830	0.7947	0.0001	6.99E-07
144		0.00	0.000	0.314	0.2730	0.7944	0.0001	6.99E-07
145		0.32	0.046	0.121	0.2841	0.7941	0.0001	6.99E-07
146		0.00	0.000	0.133	0.2754	0.7938	0.0001	6.99E-07
147		0.06	0.000	0.208	0.2608	0.7936	0.0001	6.98E-07
148		0.02	0.000	0.097	0.2529	0.7933	0.0001	6.98E-07
149		0.40	0.075	0.119	0.2663	0.7930	0.0001	6.98E-07
150		0.07	0.000	0.144	0.2667	0.7927	0.0001	6.98E-07
151		0.05	0.000	0.119	0.2596	0.7925	0.0001	6.97E-07
152		0.00	0.000	0.210	0.2386	0.7922	0.0001	6.97E-07

153	0.00	0.000	0.215	0.2171	0.7919	0.0001	6.97E-07
154	0.00	0.000	0.179	0.1992	0.7916	0.0001	6.97E-07
155	0.24	0.043	0.084	0.2061	0.8014	0.0001	7.05E-07
156	0.33	0.031	0.228	0.2147	0.8072	0.0001	7.09E-07
157	0.00	0.000	0.148	0.2030	0.8069	0.0001	7.09E-07
158	0.00	0.000	0.045	0.1986	0.8066	0.0001	7.09E-07
159	0.98	0.394	0.075	0.2147	0.8063	0.0001	7.09E-07
160	0.68	0.370	0.188	0.2263	0.8060	0.0001	7.08E-07
161	0.00	0.000	0.409	0.2210	0.8058	0.0001	7.08E-07
162	0.10	0.000	0.100	0.2206	0.8055	0.0001	7.08E-07
163	0.00	0.000	0.178	0.2028	0.8052	0.0001	7.08E-07
164	0.00	0.000	0.043	0.1985	0.8049	0.0001	7.08E-07
165	0.04	0.000	0.037	0.1985	0.8046	0.0001	7.07E-07
166	0.26	0.041	0.058	0.2100	0.8044	0.0001	7.07E-07
167	0.00	0.000	0.126	0.2015	0.8041	0.0001	7.07E-07
168	0.00	0.000	0.029	0.1987	0.8038	0.0001	7.07E-07
169	0.00	0.000	0.016	0.1971	0.8035	0.0001	7.06E-07
170	0.00	0.000	0.001	0.1970	0.8032	0.0001	7.06E-07
171	0.38	0.092	0.046	0.2123	0.8029	0.0001	7.06E-07
172	0.31	0.025	0.341	0.2136	0.8027	0.0001	7.06E-07
173	0.51	0.065	0.289	0.2251	0.8024	0.0001	7.05E-07
174	0.06	0.000	0.256	0.2120	0.8021	0.0001	7.05E-07
175	1.02	0.394	0.161	0.2245	0.8018	0.0001	7.05E-07
176	0.90	0.429	0.323	0.2362	0.8015	0.0001	7.05E-07
177	0.06	0.000	0.355	0.2444	0.8013	0.0001	7.05E-07
178	0.53	0.148	0.133	0.2575	0.8010	0.0001	7.04E-07
179	0.23	0.039	0.160	0.2691	0.8007	0.0001	7.04E-07
180	0.15	0.006	0.128	0.2739	0.8004	0.0001	7.04E-07
181	0.00	0.000	0.103	0.2642	0.8002	0.0001	7.04E-07
182	0.00	0.000	0.101	0.2542	0.7999	0.0001	7.03E-07
183	0.00	0.000	0.122	0.2420	0.7996	0.0001	7.03E-07
184	0.00	0.000	0.127	0.2292	0.7993	0.0001	7.03E-07

185	0.00	0.000	0.203	0.2089	0.7990	0.0001	7.03E-07
186	0.00	0.000	0.104	0.1986	0.7988	0.0001	7.03E-07
187	0.00	0.000	0.013	0.1970	0.8037	0.0001	7.07E-07
188	0.00	0.000	0.000	0.1970	0.8065	0.0001	7.09E-07
189	0.76	0.276	0.062	0.2131	0.8062	0.0001	7.09E-07
190	0.00	0.000	0.255	0.2138	0.8060	0.0001	7.08E-07
191	0.01	0.000	0.091	0.2054	0.8057	0.0001	7.08E-07
192	0.16	0.000	0.131	0.2087	0.8054	0.0001	7.08E-07
193	0.00	0.000	0.090	0.1997	0.8051	0.0001	7.08E-07
194	0.00	0.000	0.020	0.1977	0.8048	0.0001	7.07E-07
195	0.00	0.000	0.007	0.1970	0.8045	0.0001	7.07E-07
196	0.00	0.000	0.000	0.1970	0.8043	0.0001	7.07E-07
197	0.00	0.000	0.000	0.1970	0.8040	0.0001	7.07E-07
198	0.00	0.000	0.000	0.1970	0.8037	0.0001	7.07E-07
199	0.00	0.000	0.000	0.1970	0.8034	0.0001	7.06E-07
200	0.00	0.000	0.000	0.1970	0.8031	0.0001	7.06E-07
201	0.00	0.000	0.000	0.1970	0.8029	0.0001	7.06E-07
202	0.00	0.000	0.000	0.1970	0.8026	0.0001	7.06E-07
203	0.00	0.000	0.000	0.1970	0.8023	0.0001	7.05E-07
204	0.00	0.000	0.000	0.1970	0.8020	0.0001	7.05E-07
205	0.00	0.000	0.004	0.1970	0.8017	0.0001	7.05E-07
206	0.05	0.000	0.016	0.2001	0.8014	0.0001	7.05E-07
207	0.00	0.000	0.003	0.1998	0.8012	0.0001	7.05E-07
208	0.00	0.000	0.009	0.1989	0.8009	0.0001	7.04E-07
209	0.47	0.144	0.041	0.2129	0.8006	0.0001	7.04E-07
210	0.00	0.000	0.160	0.2117	0.8003	0.0001	7.04E-07
211	0.00	0.000	0.016	0.2102	0.8000	0.0001	7.04E-07
212	0.00	0.000	0.020	0.2082	0.7998	0.0001	7.03E-07
213	0.00	0.000	0.019	0.2063	0.7995	0.0001	7.03E-07
214	0.00	0.000	0.019	0.2044	0.7992	0.0001	7.03E-07
215	0.00	0.000	0.017	0.2027	0.7989	0.0001	7.03E-07
216	0.00	0.000	0.017	0.2010	0.7986	0.0001	7.02E-07

217	0.00	0.000	0.018	0.1992	0.7984	0.0001	7.02E-07
218	0.00	0.000	0.021	0.1971	0.7981	0.0001	7.02E-07
219	0.00	0.000	0.001	0.1970	0.7978	0.0001	7.02E-07
220	0.09	0.000	0.017	0.2047	0.7975	0.0001	7.02E-07
221	0.00	0.000	0.012	0.2036	0.7972	0.0001	7.01E-07
222	0.96	0.418	0.033	0.2171	0.7970	0.0001	7.01E-07
223	1.28	0.727	0.231	0.2287	0.7967	0.0001	7.01E-07
224	0.17	0.247	0.140	0.2404	0.7964	0.0001	7.01E-07
225	0.15	0.077	0.126	0.2520	0.7961	0.0001	7.00E-07
226	0.00	0.000	0.183	0.2413	0.7959	0.0001	7.00E-07
227	0.00	0.000	0.088	0.2325	0.7956	0.0001	7.00E-07
228	0.00	0.000	0.188	0.2137	0.7953	0.0001	7.00E-07
229	0.00	0.000	0.154	0.1983	0.7950	0.0001	7.00E-07
230	0.65	0.193	0.116	0.2141	0.7947	0.0001	6.99E-07
231	0.00	0.000	0.248	0.2081	0.7945	0.0001	6.99E-07
232	0.00	0.000	0.083	0.1998	0.7942	0.0001	6.99E-07
233	0.05	0.000	0.068	0.1978	0.7939	0.0001	6.99E-07
234	0.44	0.067	0.163	0.2121	0.7936	0.0001	6.98E-07
235	1.01	0.420	0.182	0.2237	0.7933	0.0001	6.98E-07
236	0.00	0.000	0.314	0.2282	0.7931	0.0001	6.98E-07
237	0.00	0.000	0.215	0.2067	0.7928	0.0001	6.98E-07
238	0.17	0.008	0.121	0.2097	0.7925	0.0001	6.98E-07
239	0.00	0.000	0.107	0.1998	0.7922	0.0001	6.97E-07
240	0.01	0.000	0.032	0.1978	0.7920	0.0001	6.97E-07
241	0.07	0.000	0.051	0.1992	0.7917	0.0001	6.97E-07
242	0.31	0.032	0.162	0.2080	0.7914	0.0001	6.97E-07
243	0.07	0.000	0.079	0.2101	0.7911	0.0001	6.96E-07
244	0.39	0.098	0.072	0.2219	0.7908	0.0001	6.96E-07
245	0.00	0.000	0.215	0.2102	0.7906	0.0001	6.96E-07
246	0.52	0.152	0.062	0.2257	0.7903	0.0001	6.96E-07
247	0.06	0.000	0.207	0.2266	0.7900	0.0001	6.96E-07
248	0.00	0.000	0.153	0.2114	0.7897	0.0001	6.95E-07

249	0.00	0.000	0.060	0.2054	0.7895	0.0001	6.95E-07
250	0.00	0.000	0.065	0.1989	0.7892	0.0001	6.95E-07
251	0.00	0.000	0.018	0.1971	0.7889	0.0001	6.95E-07
252	0.09	0.000	0.022	0.2039	0.7886	0.0001	6.94E-07
253	0.09	0.000	0.042	0.2083	0.7884	0.0001	6.94E-07
254	0.24	0.037	0.059	0.2188	0.7881	0.0001	6.94E-07
255	0.00	0.000	0.154	0.2071	0.7878	0.0001	6.94E-07
256	0.00	0.000	0.030	0.2042	0.7875	0.0001	6.94E-07
257	0.00	0.000	0.033	0.2008	0.7872	0.0001	6.93E-07
258	0.00	0.000	0.037	0.1971	0.7870	0.0001	6.93E-07
259	0.00	0.000	0.001	0.1970	0.7867	0.0001	6.93E-07
260	0.00	0.000	0.004	0.1970	0.7864	0.0001	6.93E-07
261	0.23	0.038	0.032	0.2092	0.7861	0.0001	6.92E-07
262	0.26	0.051	0.081	0.2204	0.7859	0.0001	6.92E-07
263	0.01	0.000	0.179	0.2090	0.7856	0.0001	6.92E-07
264	0.00	0.000	0.020	0.2070	0.7853	0.0001	6.92E-07
265	0.00	0.000	0.023	0.2047	0.7850	0.0001	6.92E-07
266	0.00	0.000	0.023	0.2024	0.7848	0.0001	6.91E-07
267	0.00	0.000	0.019	0.2005	0.7845	0.0001	6.91E-07
268	0.00	0.000	0.019	0.1986	0.7842	0.0001	6.91E-07
269	0.01	0.000	0.025	0.1971	0.7839	0.0001	6.91E-07
270	0.00	0.000	0.001	0.1970	0.7837	0.0001	6.90E-07
271	0.04	0.000	0.017	0.1991	0.7834	0.0001	6.90E-07
272	0.29	0.058	0.034	0.2132	0.7831	0.0001	6.90E-07
273	0.35	0.098	0.092	0.2246	0.7828	0.0001	6.90E-07
274	0.31	0.026	0.341	0.2258	0.7826	0.0001	6.90E-07
275	0.29	0.034	0.158	0.2349	0.7823	0.0001	6.89E-07
276	0.25	0.026	0.294	0.2288	0.7820	0.0001	6.89E-07
277	0.35	0.024	0.387	0.2228	0.7818	0.0001	6.89E-07
278	0.00	0.000	0.112	0.2144	0.7815	0.0001	6.89E-07
279	0.00	0.000	0.126	0.2019	0.7812	0.0001	6.88E-07
280	0.00	0.000	0.039	0.1980	0.7809	0.0001	6.88E-07

281		0.00	0.000	0.010	0.1970	0.7807	0.0001	6.88E-07
282		0.00	0.000	0.000	0.1970	0.7804	0.0001	6.88E-07
283		0.41	0.099	0.055	0.2129	0.7801	0.0001	6.88E-07
284		0.00	0.000	0.160	0.2069	0.7798	0.0001	6.87E-07
285		0.00	0.000	0.023	0.2046	0.7796	0.0001	6.87E-07
286		0.00	0.000	0.021	0.2025	0.7793	0.0001	6.87E-07
287		0.00	0.000	0.019	0.2006	0.7790	0.0001	6.87E-07
288		0.09	0.000	0.036	0.2060	0.7787	0.0001	6.86E-07
289		0.07	0.000	0.037	0.2095	0.7785	0.0001	6.86E-07
290		0.04	0.000	0.035	0.2104	0.7782	0.0001	6.86E-07
291		0.00	0.000	0.015	0.2089	0.7779	0.0001	6.86E-07
292		0.00	0.000	0.011	0.2079	0.7777	0.0001	6.86E-07
293		0.00	0.000	0.013	0.2065	0.7774	0.0001	6.85E-07
294		0.15	0.007	0.029	0.2174	0.7771	0.0001	6.85E-07
295		0.08	0.000	0.034	0.2226	0.7768	0.0001	6.85E-07
296		0.03	0.000	0.064	0.2191	0.7766	0.0001	6.85E-07
297		0.00	0.000	0.014	0.2179	0.7763	0.0001	6.84E-07
298		0.00	0.000	0.013	0.2166	0.7760	0.0001	6.84E-07
299	*	0.03	0.000	0.037	0.2155	0.7758	0.0001	6.84E-07
300	*	0.00	0.000	0.011	0.2144	0.7755	0.0001	6.84E-07
301		0.00	0.000	0.011	0.2133	0.7752	0.0001	6.84E-07
302		0.00	0.000	0.011	0.2123	0.7749	0.0001	6.83E-07
303		0.03	0.000	0.024	0.2126	0.7747	0.0001	6.83E-07
304		0.01	0.000	0.019	0.2119	0.7744	0.0001	6.83E-07
305		0.00	0.000	0.011	0.2109	0.7741	0.0001	6.83E-07
306		0.00	0.000	0.012	0.2097	0.7739	0.0001	6.82E-07
307	*	0.00	0.000	0.000	0.2097	0.7736	0.0001	6.82E-07
308	*	0.00	0.000	0.010	0.2087	0.7733	0.0001	6.82E-07
309		0.15	0.006	0.027	0.2197	0.7730	0.0001	6.82E-07
310		0.00	0.000	0.018	0.2186	0.7728	0.0001	6.82E-07
311	*	0.00	0.000	0.000	0.2186	0.7725	0.0001	6.81E-07
312	*	0.07	0.000	0.037	0.2206	0.7722	0.0001	6.81E-07

313	*	0.00	0.000	0.016	0.2206	0.7720	0.0001	6.81E-07
314	*	0.00	0.000	0.000	0.2206	0.7717	0.0001	6.81E-07
315		0.02	0.000	0.023	0.2205	0.7714	0.0001	6.81E-07
316		0.00	0.000	0.011	0.2195	0.7711	0.0001	6.80E-07
317		0.23	0.037	0.026	0.2322	0.7709	0.0001	6.80E-07
318		0.00	0.000	0.075	0.2284	0.7706	0.0001	6.80E-07
319		0.00	0.000	0.074	0.2210	0.7703	0.0001	6.80E-07
320		0.00	0.000	0.086	0.2124	0.7701	0.0001	6.79E-07
321		0.54	0.155	0.074	0.2276	0.7698	0.0001	6.79E-07
322		0.00	0.000	0.085	0.2345	0.7695	0.0001	6.79E-07
323		0.00	0.000	0.036	0.2309	0.7693	0.0001	6.79E-07
324		0.99	0.437	0.057	0.2446	0.7690	0.0001	6.79E-07
325		0.22	0.194	0.070	0.2562	0.7687	0.0001	6.78E-07
326	*	0.00	0.000	0.053	0.2562	0.7684	0.0001	6.78E-07
327		0.00	0.000	0.000	0.2563	0.7682	0.0001	6.78E-07
328		0.00	0.000	0.000	0.2563	0.7679	0.0001	6.78E-07
329		0.00	0.000	0.000	0.2563	0.7676	0.0001	6.77E-07
330		0.00	0.000	0.000	0.2563	0.7674	0.0001	6.77E-07
331	*	0.00	0.000	0.048	0.2563	0.7671	0.0001	6.77E-07
332		0.00	0.000	0.000	0.2563	0.7668	0.0001	6.77E-07
333		0.38	0.122	0.000	0.2698	0.7666	0.0001	6.77E-07
334		0.62	0.288	0.000	0.2815	0.7663	0.0001	6.76E-07
335		1.31	0.791	0.000	0.2931	0.7660	0.0001	6.76E-07
336		0.00	0.000	0.000	0.2931	0.7658	0.0001	6.76E-07
337	*	0.00	0.000	0.030	0.2931	0.7655	0.0001	6.76E-07
338		0.02	0.000	0.000	0.2951	0.7652	0.0001	6.76E-07
339	*	0.00	0.000	0.033	0.2951	0.7650	0.0001	6.75E-07
340	*	0.00	0.000	0.030	0.2951	0.7647	0.0001	6.75E-07
341	*	0.54	0.282	0.000	0.3083	0.7644	0.0001	6.75E-07
342	*	0.26	0.061	0.010	0.3199	0.7642	0.0001	6.75E-07
343		0.00	0.260	0.000	0.3316	0.7639	0.0001	6.74E-07
344	*	0.00	0.001	0.019	0.3432	0.7636	0.0001	6.74E-07

345			0.00	0.177	0.012	0.3548	0.7633	0.0001	6.74E-07
346			0.00	0.000	0.094	0.3568	0.7631	0.0001	6.74E-07
347			0.00	0.000	0.044	0.3525	0.7628	0.0001	6.74E-07
348			0.07	0.000	0.051	0.3512	0.7843	0.0001	6.91E-07
349	*		0.00	0.000	0.033	0.3437	0.8989	0.0001	7.83E-07
350	*		0.00	0.000	0.000	0.3389	1.0222	0.0001	8.81E-07
351	*		0.00	0.000	0.000	0.3348	1.1719	0.0001	9.98E-07
352	*		0.00	0.000	0.000	0.3316	1.3073	0.0001	1.10E-06
353	*		0.00	0.000	0.000	0.3287	1.3984	0.0002	1.17E-06
354	*		0.00	0.000	0.000	0.3264	1.4835	0.0002	1.24E-06
355	*		0.00	0.000	0.000	0.3243	1.5522	0.0002	1.29E-06
356	*		0.00	0.000	0.000	0.3224	1.6146	0.0002	1.34E-06
357			0.00	0.000	0.063	0.3144	1.6665	0.0002	1.38E-06
358	*		0.00	0.000	0.038	0.3094	1.7103	0.0002	1.41E-06
359			0.03	0.000	0.079	0.3033	1.7555	0.0002	1.45E-06
360			0.06	0.000	0.093	0.2991	1.7974	0.0002	1.48E-06
361			0.00	0.000	0.068	0.2918	1.8236	0.0002	1.50E-06
362			0.00	0.000	0.050	0.2866	1.8349	0.0002	1.51E-06
363			0.00	0.000	0.043	0.2823	1.8362	0.0002	1.51E-06
364	*		0.05	0.000	0.026	0.2843	1.8356	0.0002	1.51E-06
365	*	*	0.00	0.000	0.005	0.2843	1.8349	0.0002	1.51E-06

* = Frozen (air or soil)

Annual Totals for Year 13			
	inches	cubic feet	percent
Precipitation	46.59	169,134.1	100.00
Runoff	18.392	66,762.0	39.47
Evapotranspiration	27.002	98,016.7	57.95
Recirculation into Layer 1	0.0345	125.3	0.07
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0345	125.3	0.07
Percolation/Leakage through Layer 5	0.000266	0.9671	0.00
Average Head on Top of Layer 4	0.8339	---	---
Change in Water Storage	1.1994	4,354.0	2.57
Soil Water at Start of Year	293.2134	1,064,364.7	629.30
Soil Water at End of Year	294.4129	1,068,718.7	631.88
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0344	-124.9	-0.07

Daily Output for Year 14

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1		*	0.00	0.000	0.000	0.2843	1.8343	0.0002	1.51E-06
2	*	*	0.44	0.000	0.017	0.2843	1.8336	0.0002	1.51E-06
3	*	*	0.03	0.000	0.010	0.2843	1.8330	0.0002	1.51E-06
4		*	0.00	0.000	0.000	0.2844	1.8324	0.0002	1.50E-06
5	*	*	0.00	0.000	0.033	0.2844	1.8317	0.0002	1.50E-06
6		*	0.00	0.090	0.031	0.2892	1.8311	0.0002	1.50E-06
7		*	0.00	0.100	0.057	0.2893	1.8304	0.0002	1.50E-06
8	*	*	0.00	0.000	0.042	0.2893	1.8298	0.0002	1.50E-06
9		*	0.00	0.000	0.000	0.2893	1.8291	0.0002	1.50E-06
10		*	0.00	0.000	0.039	0.2893	1.8285	0.0002	1.50E-06
11			0.00	0.000	0.050	0.2837	1.8329	0.0002	1.51E-06
12			0.00	0.000	0.091	0.2741	1.8502	0.0002	1.52E-06
13			0.00	0.000	0.060	0.2681	1.8610	0.0002	1.53E-06
14			0.00	0.000	0.058	0.2623	1.8604	0.0002	1.53E-06
15	*		0.00	0.000	0.000	0.2624	1.8597	0.0002	1.53E-06
16	*	*	0.00	0.000	0.000	0.2624	1.8591	0.0002	1.53E-06
17	*	*	0.00	0.000	0.000	0.2624	1.8584	0.0002	1.52E-06
18	*	*	0.00	0.000	0.000	0.2624	1.8578	0.0002	1.52E-06
19		*	0.00	0.000	0.000	0.2624	1.8571	0.0002	1.52E-06
20	*	*	0.00	0.000	0.000	0.2625	1.8565	0.0002	1.52E-06
21	*	*	0.00	0.000	0.000	0.2625	1.8558	0.0002	1.52E-06
22	*	*	0.00	0.000	0.000	0.2625	1.8552	0.0002	1.52E-06
23	*	*	0.00	0.000	0.000	0.2625	1.8545	0.0002	1.52E-06
24	*	*	0.02	0.000	0.017	0.2626	1.8539	0.0002	1.52E-06

25		*	0.00	0.000	0.000	0.2626	1.8532	0.0002	1.52E-06
26		*	0.00	0.000	0.000	0.2626	1.8526	0.0002	1.52E-06
27	*	*	0.00	0.000	0.000	0.2626	1.8519	0.0002	1.52E-06
28	*	*	0.70	0.000	0.011	0.2626	1.8513	0.0002	1.52E-06
29	*	*	0.00	0.000	0.014	0.2627	1.8506	0.0002	1.52E-06
30		*	0.00	0.277	0.011	0.2673	1.8500	0.0002	1.52E-06
31		*	0.00	0.165	0.051	0.2673	1.8493	0.0002	1.52E-06
32	*	*	0.04	0.000	0.024	0.2758	1.8487	0.0002	1.52E-06
33	*	*	0.02	0.000	0.038	0.2758	1.8480	0.0002	1.52E-06
34	*	*	0.00	0.000	0.026	0.2758	1.8474	0.0002	1.52E-06
35	*	*	0.00	0.000	0.000	0.2758	1.8467	0.0002	1.52E-06
36	*	*	0.00	0.000	0.000	0.2759	1.8461	0.0002	1.52E-06
37	*	*	0.00	0.000	0.000	0.2759	1.8454	0.0002	1.51E-06
38	*	*	0.00	0.000	0.000	0.2759	1.8448	0.0002	1.51E-06
39		*	0.00	0.000	0.000	0.2759	1.8442	0.0002	1.51E-06
40		*	0.11	0.000	0.009	0.2855	1.8435	0.0002	1.51E-06
41		*	0.10	0.001	0.009	0.2947	1.8429	0.0002	1.51E-06
42			0.03	0.000	0.106	0.2871	1.8422	0.0002	1.51E-06
43			0.00	0.000	0.083	0.2788	1.8416	0.0002	1.51E-06
44	*		0.75	0.000	0.042	0.2808	1.8409	0.0002	1.51E-06
45	*	*	0.00	0.000	0.019	0.2809	1.8403	0.0002	1.51E-06
46	*	*	0.00	0.000	0.023	0.2809	1.8396	0.0002	1.51E-06
47		*	0.00	0.389	0.018	0.2820	1.8390	0.0002	1.51E-06
48		*	0.00	0.000	0.193	0.2858	1.8384	0.0002	1.51E-06
49		*	0.00	0.000	0.000	0.2858	1.8377	0.0002	1.51E-06
50	*	*	0.00	0.000	0.000	0.2858	1.8371	0.0002	1.51E-06
51		*	0.00	0.000	0.000	0.2859	1.8364	0.0002	1.51E-06
52			0.00	0.000	0.067	0.2792	1.8358	0.0002	1.51E-06
53			0.00	0.000	0.164	0.2625	1.8396	0.0002	1.51E-06
54			1.08	0.425	0.135	0.2779	1.8405	0.0002	1.51E-06
55			0.00	0.003	0.245	0.2895	1.8398	0.0002	1.51E-06
56			0.16	0.008	0.195	0.2842	1.8392	0.0002	1.51E-06

57		0.26	0.032	0.168	0.2874	1.8386	0.0002	1.51E-06
58		0.04	0.000	0.243	0.2704	1.8379	0.0002	1.51E-06
59		0.00	0.000	0.234	0.2471	1.8373	0.0002	1.51E-06
60		0.13	0.000	0.259	0.2344	1.8366	0.0002	1.51E-06
61		0.00	0.000	0.123	0.2222	1.8360	0.0002	1.51E-06
62		0.00	0.000	0.090	0.2132	1.8353	0.0002	1.51E-06
63		0.07	0.000	0.106	0.2096	1.8347	0.0002	1.51E-06
64	*	0.07	0.000	0.037	0.2116	1.8341	0.0002	1.51E-06
65		0.00	0.000	0.073	0.2025	1.8720	0.0002	1.53E-06
66		0.00	0.000	0.030	0.1994	1.9389	0.0002	1.59E-06
67		0.00	0.000	0.012	0.1982	1.9401	0.0002	1.59E-06
68		0.00	0.000	0.009	0.1974	1.9395	0.0002	1.59E-06
69		0.00	0.000	0.002	0.1971	1.9388	0.0002	1.59E-06
70		0.00	0.000	0.001	0.1970	1.9381	0.0002	1.58E-06
71		0.00	0.000	0.000	0.1970	1.9374	0.0002	1.58E-06
72		0.00	0.000	0.000	0.1970	1.9367	0.0002	1.58E-06
73		0.00	0.000	0.000	0.1970	1.9361	0.0002	1.58E-06
74		0.00	0.000	0.000	0.1970	1.9354	0.0002	1.58E-06
75		0.00	0.000	0.000	0.1970	1.9347	0.0002	1.58E-06
76		0.00	0.000	0.000	0.1970	1.9340	0.0002	1.58E-06
77		0.00	0.000	0.000	0.1970	1.9333	0.0002	1.58E-06
78		0.00	0.000	0.000	0.1970	1.9327	0.0002	1.58E-06
79		0.00	0.000	0.000	0.1970	1.9320	0.0002	1.58E-06
80	*	0.01	0.000	0.010	0.1970	1.9313	0.0002	1.58E-06
81	*	0.06	0.000	0.058	0.1970	1.9306	0.0002	1.58E-06
82	*	0.00	0.000	0.000	0.1970	1.9300	0.0002	1.58E-06
83		0.00	0.000	0.000	0.1970	1.9293	0.0002	1.58E-06
84	*	0.70	0.000	0.040	0.1990	1.9286	0.0002	1.58E-06
85		0.06	0.260	0.039	0.2134	1.9279	0.0002	1.58E-06
86		0.00	0.000	0.154	0.2233	1.9273	0.0002	1.58E-06
87		0.39	0.062	0.138	0.2366	1.9266	0.0002	1.58E-06
88	*	0.00	0.000	0.103	0.2326	1.9259	0.0002	1.58E-06

89	*	0.00	0.000	0.005	0.2327	1.9253	0.0002	1.57E-06
90	*	0.16	0.000	0.050	0.2347	1.9246	0.0002	1.57E-06
91	*	0.10	0.000	0.078	0.2366	1.9239	0.0002	1.57E-06
92	*	0.37	0.000	0.022	0.2386	1.9232	0.0002	1.57E-06
93	*	0.00	0.000	0.018	0.2406	1.9226	0.0002	1.57E-06
94		0.00	0.114	0.032	0.2534	1.9219	0.0002	1.57E-06
95		0.00	0.000	0.090	0.2555	1.9212	0.0002	1.57E-06
96		0.00	0.000	0.101	0.2455	1.9205	0.0002	1.57E-06
97		0.00	0.000	0.132	0.2322	1.9199	0.0002	1.57E-06
98	*	0.00	0.000	0.062	0.2260	1.9193	0.0002	1.57E-06
99		0.10	0.000	0.098	0.2261	1.9186	0.0002	1.57E-06
100		0.00	0.000	0.153	0.2108	1.9179	0.0002	1.57E-06
101		0.00	0.000	0.124	0.1984	1.9172	0.0002	1.57E-06
102		0.00	0.000	0.009	0.1976	1.9166	0.0002	1.57E-06
103		0.04	0.000	0.017	0.1995	1.9159	0.0002	1.57E-06
104		0.06	0.000	0.011	0.2046	1.9152	0.0002	1.57E-06
105		1.30	0.616	0.044	0.2184	1.9146	0.0002	1.57E-06
106		0.00	0.068	0.252	0.2300	1.9139	0.0002	1.57E-06
107		0.00	0.000	0.127	0.2241	1.9132	0.0002	1.57E-06
108		0.00	0.000	0.110	0.2132	1.9125	0.0002	1.57E-06
109		0.00	0.000	0.134	0.1998	1.9119	0.0002	1.56E-06
110		0.07	0.000	0.047	0.2019	1.9112	0.0002	1.56E-06
111		0.08	0.000	0.029	0.2070	1.9105	0.0002	1.56E-06
112		0.67	0.181	0.185	0.2203	1.9099	0.0002	1.56E-06
113		0.00	0.000	0.201	0.2174	1.9104	0.0002	1.56E-06
114		0.21	0.026	0.098	0.2231	1.9105	0.0002	1.56E-06
115		0.00	0.000	0.119	0.2138	1.9098	0.0002	1.56E-06
116		0.00	0.000	0.097	0.2042	1.9091	0.0002	1.56E-06
117		0.63	0.102	0.272	0.2202	1.9085	0.0002	1.56E-06
118		0.05	0.000	0.223	0.2129	1.9078	0.0002	1.56E-06
119		0.12	0.000	0.138	0.2108	1.9072	0.0002	1.56E-06
120		0.01	0.000	0.097	0.2024	1.9065	0.0002	1.56E-06

121	0.39	0.054	0.145	0.2164	1.9058	0.0002	1.56E-06
122	0.00	0.000	0.196	0.2023	1.9052	0.0002	1.56E-06
123	0.13	0.000	0.067	0.2084	1.9045	0.0002	1.56E-06
124	0.02	0.000	0.060	0.2047	1.9038	0.0002	1.56E-06
125	0.00	0.000	0.048	0.1999	1.9032	0.0002	1.56E-06
126	0.10	0.000	0.034	0.2063	1.9025	0.0002	1.56E-06
127	0.01	0.000	0.026	0.2043	1.9018	0.0002	1.56E-06
128	0.00	0.000	0.024	0.2019	1.9012	0.0002	1.56E-06
129	0.26	0.039	0.041	0.2156	1.9005	0.0002	1.56E-06
130	0.01	0.000	0.077	0.2128	1.8998	0.0002	1.56E-06
131	0.00	0.000	0.023	0.2105	1.8992	0.0002	1.56E-06
132	0.00	0.000	0.020	0.2086	1.8985	0.0002	1.55E-06
133	0.00	0.000	0.018	0.2068	1.8978	0.0002	1.55E-06
134	0.00	0.000	0.018	0.2051	1.8972	0.0002	1.55E-06
135	0.00	0.000	0.017	0.2034	1.8965	0.0002	1.55E-06
136	0.14	0.000	0.023	0.2148	1.8958	0.0002	1.55E-06
137	0.00	0.000	0.018	0.2130	1.8952	0.0002	1.55E-06
138	0.00	0.000	0.017	0.2113	1.8945	0.0002	1.55E-06
139	0.00	0.000	0.015	0.2098	1.8938	0.0002	1.55E-06
140	0.61	0.221	0.026	0.2244	1.8932	0.0002	1.55E-06
141	0.00	0.000	0.265	0.2197	1.8925	0.0002	1.55E-06
142	0.01	0.000	0.189	0.2016	1.8919	0.0002	1.55E-06
143	0.00	0.000	0.045	0.1972	1.8912	0.0002	1.55E-06
144	0.22	0.031	0.067	0.2057	1.8905	0.0002	1.55E-06
145	0.03	0.000	0.065	0.2055	1.8899	0.0002	1.55E-06
146	0.00	0.000	0.033	0.2023	1.8892	0.0002	1.55E-06
147	0.01	0.000	0.034	0.2004	1.8886	0.0002	1.55E-06
148	0.17	0.013	0.028	0.2122	1.8879	0.0002	1.55E-06
149	0.07	0.000	0.036	0.2169	1.8872	0.0002	1.55E-06
150	0.17	0.017	0.021	0.2290	1.8866	0.0002	1.55E-06
151	0.00	0.000	0.036	0.2271	1.8859	0.0002	1.55E-06
152	0.49	0.166	0.032	0.2402	1.8853	0.0002	1.54E-06

153	0.04	0.000	0.166	0.2435	1.8846	0.0002	1.54E-06
154	0.00	0.000	0.133	0.2302	1.8839	0.0002	1.54E-06
155	0.00	0.000	0.256	0.2047	1.8833	0.0002	1.54E-06
156	0.00	0.000	0.070	0.1977	1.8826	0.0002	1.54E-06
157	0.00	0.000	0.004	0.1974	1.8820	0.0002	1.54E-06
158	0.00	0.000	0.004	0.1970	1.8813	0.0002	1.54E-06
159	0.00	0.000	0.004	0.1970	1.8807	0.0002	1.54E-06
160	1.25	0.571	0.042	0.2132	1.8800	0.0002	1.54E-06
161	0.00	0.000	0.478	0.2133	1.8793	0.0002	1.54E-06
162	1.21	0.378	0.429	0.2273	1.8787	0.0002	1.54E-06
163	0.05	0.000	0.218	0.2371	1.8780	0.0002	1.54E-06
164	1.13	0.406	0.353	0.2498	1.8774	0.0002	1.54E-06
165	0.28	0.127	0.164	0.2614	1.8767	0.0002	1.54E-06
166	0.00	0.000	0.156	0.2582	1.8760	0.0002	1.54E-06
167	0.00	0.000	0.210	0.2372	1.8754	0.0002	1.54E-06
168	0.00	0.000	0.215	0.2157	1.8747	0.0002	1.54E-06
169	0.00	0.000	0.164	0.1994	1.8741	0.0002	1.54E-06
170	0.38	0.051	0.151	0.2125	1.8734	0.0002	1.54E-06
171	0.00	0.000	0.168	0.2008	1.8728	0.0002	1.54E-06
172	0.00	0.000	0.031	0.1977	1.8721	0.0002	1.53E-06
173	0.21	0.030	0.034	0.2088	1.8715	0.0002	1.53E-06
174	0.00	0.000	0.049	0.2070	1.8708	0.0002	1.53E-06
175	0.04	0.000	0.032	0.2083	1.8701	0.0002	1.53E-06
176	0.74	0.292	0.040	0.2217	1.8695	0.0002	1.53E-06
177	0.29	0.032	0.440	0.2276	1.8688	0.0002	1.53E-06
178	0.00	0.000	0.253	0.2055	1.8682	0.0002	1.53E-06
179	0.00	0.000	0.076	0.1980	1.8675	0.0002	1.53E-06
180	0.00	0.000	0.007	0.1972	1.8669	0.0002	1.53E-06
181	0.16	0.007	0.034	0.2085	1.8662	0.0002	1.53E-06
182	0.22	0.036	0.051	0.2184	1.8656	0.0002	1.53E-06
183	0.92	0.410	0.083	0.2299	1.8649	0.0002	1.53E-06
184	0.05	0.000	0.290	0.2409	1.8643	0.0002	1.53E-06

185	0.00	0.000	0.188	0.2221	1.8636	0.0002	1.53E-06
186	0.07	0.000	0.122	0.2173	1.8630	0.0002	1.53E-06
187	0.61	0.193	0.111	0.2295	1.8623	0.0002	1.53E-06
188	0.23	0.032	0.342	0.2307	1.8616	0.0002	1.53E-06
189	0.00	0.000	0.232	0.2108	1.8610	0.0002	1.53E-06
190	0.00	0.000	0.082	0.2026	1.8603	0.0002	1.53E-06
191	0.01	0.000	0.058	0.1983	1.8597	0.0002	1.53E-06
192	0.00	0.000	0.007	0.1977	1.8590	0.0002	1.53E-06
193	0.00	0.000	0.003	0.1973	1.8584	0.0002	1.52E-06
194	1.41	0.652	0.074	0.2129	1.8577	0.0002	1.52E-06
195	0.01	0.037	0.344	0.2246	1.8571	0.0002	1.52E-06
196	0.00	0.000	0.114	0.2169	1.8564	0.0002	1.52E-06
197	0.00	0.000	0.101	0.2069	1.8558	0.0002	1.52E-06
198	0.13	0.000	0.095	0.2102	1.8551	0.0002	1.52E-06
199	0.09	0.000	0.119	0.2077	1.8545	0.0002	1.52E-06
200	0.00	0.000	0.079	0.1998	1.8538	0.0002	1.52E-06
201	0.02	0.000	0.041	0.1980	1.8532	0.0002	1.52E-06
202	0.00	0.000	0.009	0.1972	1.8525	0.0002	1.52E-06
203	0.00	0.000	0.001	0.1971	1.8519	0.0002	1.52E-06
204	0.00	0.000	0.001	0.1970	1.8512	0.0002	1.52E-06
205	0.15	0.001	0.026	0.2090	1.8506	0.0002	1.52E-06
206	0.00	0.000	0.017	0.2074	1.8499	0.0002	1.52E-06
207	0.00	0.000	0.024	0.2050	1.8493	0.0002	1.52E-06
208	0.00	0.000	0.027	0.2028	1.8487	0.0002	1.52E-06
209	0.00	0.000	0.022	0.2006	1.8480	0.0002	1.52E-06
210	0.00	0.000	0.023	0.1984	1.8474	0.0002	1.52E-06
211	0.00	0.000	0.011	0.1973	1.8467	0.0002	1.52E-06
212	0.29	0.064	0.034	0.2105	1.8461	0.0002	1.52E-06
213	0.15	0.014	0.086	0.2210	1.8454	0.0002	1.51E-06
214	0.67	0.277	0.043	0.2324	1.8448	0.0002	1.51E-06
215	0.00	0.000	0.270	0.2306	1.8441	0.0002	1.51E-06
216	0.07	0.000	0.143	0.2233	1.8435	0.0002	1.51E-06

217	0.00	0.000	0.125	0.2113	1.8428	0.0002	1.51E-06
218	0.58	0.142	0.151	0.2263	1.8422	0.0002	1.51E-06
219	0.04	0.000	0.179	0.2268	1.8415	0.0002	1.51E-06
220	0.00	0.000	0.266	0.2002	1.8409	0.0002	1.51E-06
221	0.00	0.000	0.031	0.1971	1.8403	0.0002	1.51E-06
222	0.00	0.000	0.001	0.1971	1.8396	0.0002	1.51E-06
223	0.50	0.098	0.152	0.2126	1.8390	0.0002	1.51E-06
224	0.00	0.000	0.201	0.2023	1.8383	0.0002	1.51E-06
225	0.00	0.000	0.037	0.1986	1.8377	0.0002	1.51E-06
226	0.00	0.000	0.016	0.1970	1.8370	0.0002	1.51E-06
227	0.00	0.000	0.000	0.1970	1.8364	0.0002	1.51E-06
228	0.00	0.000	0.000	0.1970	1.8357	0.0002	1.51E-06
229	0.00	0.000	0.000	0.1970	1.8351	0.0002	1.51E-06
230	0.00	0.000	0.000	0.1970	1.8345	0.0002	1.51E-06
231	0.50	0.149	0.037	0.2131	1.8338	0.0002	1.51E-06
232	0.01	0.000	0.171	0.2118	1.8332	0.0002	1.51E-06
233	0.00	0.000	0.119	0.1999	1.8325	0.0002	1.51E-06
234	0.00	0.000	0.024	0.1975	1.8319	0.0002	1.50E-06
235	0.01	0.000	0.017	0.1971	1.8312	0.0002	1.50E-06
236	0.00	0.000	0.001	0.1971	1.8306	0.0002	1.50E-06
237	0.38	0.090	0.050	0.2120	1.8300	0.0002	1.50E-06
238	0.07	0.000	0.117	0.2162	1.8293	0.0002	1.50E-06
239	0.25	0.045	0.048	0.2275	1.8287	0.0002	1.50E-06
240	0.21	0.037	0.086	0.2366	1.8280	0.0002	1.50E-06
241	0.00	0.000	0.121	0.2283	1.8274	0.0002	1.50E-06
242	0.00	0.000	0.145	0.2138	1.8268	0.0002	1.50E-06
243	0.00	0.000	0.121	0.2017	1.8261	0.0002	1.50E-06
244	0.00	0.000	0.041	0.1976	1.8255	0.0002	1.50E-06
245	0.00	0.000	0.003	0.1973	1.8248	0.0002	1.50E-06
246	0.39	0.094	0.051	0.2124	1.8242	0.0002	1.50E-06
247	0.00	0.000	0.110	0.2108	1.8236	0.0002	1.50E-06
248	0.19	0.024	0.029	0.2224	1.8230	0.0002	1.50E-06

249	0.01	0.000	0.079	0.2174	1.8223	0.0002	1.50E-06
250	0.06	0.000	0.031	0.2200	1.8217	0.0002	1.50E-06
251	0.00	0.000	0.027	0.2173	1.8211	0.0002	1.50E-06
252	0.00	0.000	0.022	0.2151	1.8204	0.0002	1.50E-06
253	0.00	0.000	0.021	0.2131	1.8198	0.0002	1.50E-06
254	0.63	0.231	0.036	0.2271	1.8191	0.0002	1.49E-06
255	0.42	0.172	0.183	0.2387	1.8185	0.0002	1.49E-06
256	0.00	0.000	0.134	0.2424	1.8179	0.0002	1.49E-06
257	0.00	0.000	0.093	0.2332	1.8172	0.0002	1.49E-06
258	0.00	0.000	0.281	0.2051	1.8166	0.0002	1.49E-06
259	0.00	0.000	0.071	0.1980	1.8160	0.0002	1.49E-06
260	0.00	0.000	0.005	0.1975	1.8153	0.0002	1.49E-06
261	0.00	0.000	0.005	0.1970	1.8147	0.0002	1.49E-06
262	0.00	0.000	0.000	0.1970	1.8141	0.0002	1.49E-06
263	0.00	0.000	0.000	0.1970	1.8134	0.0002	1.49E-06
264	0.00	0.000	0.000	0.1970	1.8128	0.0002	1.49E-06
265	0.00	0.000	0.000	0.1970	1.8122	0.0002	1.49E-06
266	0.00	0.000	0.000	0.1970	1.8115	0.0002	1.49E-06
267	0.00	0.000	0.000	0.1970	1.8109	0.0002	1.49E-06
268	0.00	0.000	0.000	0.1970	1.8102	0.0002	1.49E-06
269	0.00	0.000	0.001	0.1970	1.8096	0.0002	1.49E-06
270	0.00	0.000	0.000	0.1970	1.8090	0.0002	1.49E-06
271	0.00	0.000	0.000	0.1970	1.8083	0.0002	1.49E-06
272	0.00	0.000	0.000	0.1970	1.8077	0.0002	1.49E-06
273	0.00	0.000	0.000	0.1970	1.8071	0.0002	1.49E-06
274	0.41	0.110	0.029	0.2132	1.8064	0.0002	1.49E-06
275	0.01	0.000	0.125	0.2130	1.8058	0.0002	1.48E-06
276	0.00	0.000	0.014	0.2117	1.8052	0.0002	1.48E-06
277	0.00	0.000	0.014	0.2103	1.8045	0.0002	1.48E-06
278	0.00	0.000	0.013	0.2090	1.8039	0.0002	1.48E-06
279	0.00	0.000	0.012	0.2078	1.8033	0.0002	1.48E-06
280	0.00	0.000	0.012	0.2067	1.8027	0.0002	1.48E-06

281		0.14	0.006	0.020	0.2179	1.8020	0.0002	1.48E-06
282		0.00	0.000	0.019	0.2166	1.8014	0.0002	1.48E-06
283	*	0.00	0.000	0.012	0.2154	1.8008	0.0002	1.48E-06
284		0.00	0.000	0.011	0.2143	1.8001	0.0002	1.48E-06
285		0.00	0.000	0.011	0.2133	1.7995	0.0002	1.48E-06
286		0.00	0.000	0.010	0.2123	1.7989	0.0002	1.48E-06
287		1.34	0.653	0.023	0.2264	1.7982	0.0002	1.48E-06
288		0.00	0.119	0.173	0.2380	1.7976	0.0002	1.48E-06
289		0.00	0.000	0.240	0.2259	1.7970	0.0002	1.48E-06
290		0.00	0.000	0.165	0.2094	1.7963	0.0002	1.48E-06
291		0.00	0.000	0.086	0.2008	1.7957	0.0002	1.48E-06
292		0.00	0.000	0.038	0.1971	1.7951	0.0002	1.48E-06
293		0.00	0.000	0.001	0.1970	1.7945	0.0002	1.48E-06
294		0.00	0.000	0.000	0.1970	1.7938	0.0002	1.48E-06
295		0.00	0.000	0.000	0.1970	1.7932	0.0002	1.48E-06
296		0.00	0.000	0.000	0.1970	1.7926	0.0002	1.47E-06
297		0.00	0.000	0.000	0.1970	1.7920	0.0002	1.47E-06
298		0.00	0.000	0.000	0.1970	1.7913	0.0002	1.47E-06
299		0.00	0.000	0.000	0.1970	1.7907	0.0002	1.47E-06
300		0.60	0.202	0.037	0.2133	1.7901	0.0002	1.47E-06
301		0.00	0.007	0.069	0.2249	1.7894	0.0002	1.47E-06
302		0.00	0.000	0.074	0.2183	1.7888	0.0002	1.47E-06
303		0.00	0.000	0.054	0.2129	1.7882	0.0002	1.47E-06
304		0.00	0.000	0.096	0.2033	1.7876	0.0002	1.47E-06
305		0.00	0.000	0.061	0.1973	1.7869	0.0002	1.47E-06
306	*	0.22	0.000	0.027	0.1993	1.7863	0.0002	1.47E-06
307	*	0.00	0.000	0.032	0.2013	1.7857	0.0002	1.47E-06
308		0.00	0.000	0.091	0.2048	1.7851	0.0002	1.47E-06
309		0.00	0.000	0.026	0.2022	1.7844	0.0002	1.47E-06
310		0.00	0.000	0.029	0.1993	1.7838	0.0002	1.47E-06
311		0.00	0.000	0.012	0.1982	1.7832	0.0002	1.47E-06
312		0.00	0.000	0.009	0.1973	1.7826	0.0002	1.47E-06

313		0.00	0.000	0.002	0.1971	1.7819	0.0002	1.47E-06
314		0.00	0.000	0.001	0.1970	1.7813	0.0002	1.47E-06
315		0.00	0.000	0.000	0.1970	1.7807	0.0002	1.47E-06
316		0.00	0.000	0.000	0.1970	1.7801	0.0002	1.47E-06
317		0.00	0.000	0.000	0.1970	1.7794	0.0002	1.46E-06
318		0.00	0.000	0.000	0.1970	1.7788	0.0002	1.46E-06
319		0.42	0.114	0.030	0.2133	1.7782	0.0002	1.46E-06
320		0.54	0.202	0.135	0.2249	1.7776	0.0002	1.46E-06
321		0.05	0.000	0.147	0.2351	1.7770	0.0002	1.46E-06
322		0.09	0.000	0.099	0.2338	1.7763	0.0002	1.46E-06
323		0.02	0.000	0.149	0.2209	1.7757	0.0002	1.46E-06
324		0.00	0.000	0.092	0.2117	1.7751	0.0002	1.46E-06
325		0.00	0.000	0.099	0.2018	1.7745	0.0002	1.46E-06
326		0.00	0.000	0.041	0.1977	1.7738	0.0002	1.46E-06
327		0.00	0.000	0.005	0.1972	1.7732	0.0002	1.46E-06
328		0.00	0.000	0.002	0.1970	1.7726	0.0002	1.46E-06
329		0.00	0.000	0.000	0.1970	1.7720	0.0002	1.46E-06
330		0.00	0.000	0.000	0.1970	1.7714	0.0002	1.46E-06
331		0.00	0.000	0.000	0.1970	1.7707	0.0002	1.46E-06
332		0.02	0.000	0.010	0.1983	1.7701	0.0002	1.46E-06
333		0.13	0.000	0.019	0.2091	1.7695	0.0002	1.46E-06
334		0.07	0.000	0.019	0.2147	1.7689	0.0002	1.46E-06
335		0.00	0.000	0.010	0.2137	1.7683	0.0002	1.46E-06
336		0.00	0.000	0.015	0.2122	1.7676	0.0002	1.46E-06
337	*	0.00	0.000	0.015	0.2108	1.7670	0.0002	1.46E-06
338	*	0.00	0.000	0.014	0.2094	1.7664	0.0002	1.46E-06
339		0.00	0.000	0.013	0.2081	1.7658	0.0002	1.45E-06
340	*	0.00	0.000	0.013	0.2068	1.7652	0.0002	1.45E-06
341	*	0.08	0.000	0.021	0.2088	1.7645	0.0002	1.45E-06
342	*	0.00	0.000	0.044	0.2085	1.7639	0.0002	1.45E-06
343	*	0.00	0.000	0.013	0.2073	1.7633	0.0002	1.45E-06
344	*	0.17	0.000	0.040	0.2093	1.7627	0.0002	1.45E-06

345	*	0.00	0.000	0.040	0.2112	1.7621	0.0002	1.45E-06
346	*	0.00	0.000	0.019	0.2132	1.7615	0.0002	1.45E-06
347		0.00	0.000	0.024	0.2119	1.7608	0.0002	1.45E-06
348	*	0.00	0.000	0.000	0.2119	1.7602	0.0002	1.45E-06
349	*	0.00	0.000	0.000	0.2119	1.7596	0.0002	1.45E-06
350	*	0.11	0.000	0.041	0.2139	1.7590	0.0002	1.45E-06
351		0.04	0.000	0.088	0.2140	1.7584	0.0002	1.45E-06
352		0.08	0.000	0.022	0.2199	1.7578	0.0002	1.45E-06
353		0.18	0.019	0.019	0.2324	1.7571	0.0002	1.45E-06
354		0.00	0.000	0.031	0.2313	1.7565	0.0002	1.45E-06
355		0.00	0.000	0.011	0.2303	1.7559	0.0002	1.45E-06
356		0.53	0.184	0.023	0.2451	1.7553	0.0002	1.45E-06
357		0.00	0.000	0.087	0.2541	1.7547	0.0002	1.45E-06
358		0.00	0.000	0.068	0.2473	1.7541	0.0002	1.45E-06
359		0.00	0.000	0.103	0.2370	1.7535	0.0002	1.45E-06
360		0.00	0.000	0.080	0.2291	1.7529	0.0002	1.44E-06
361		0.00	0.000	0.060	0.2231	1.7522	0.0002	1.44E-06
362		0.00	0.000	0.107	0.2124	1.7516	0.0002	1.44E-06
363		0.00	0.000	0.051	0.2073	1.7510	0.0002	1.44E-06
364	*	0.00	0.000	0.000	0.2073	1.7504	0.0002	1.44E-06
365		0.00	0.000	0.053	0.2020	1.7498	0.0002	1.44E-06

* = Frozen (air or soil)

Annual Totals for Year 14			
	inches	cubic feet	percent
Precipitation	32.50	117,973.8	100.00
Runoff	9.773	35,475.9	30.07
Evapotranspiration	23.577	85,583.5	72.54
Recirculation into Layer 1	0.0763	277.1	0.23
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0763	277.1	0.23
Percolation/Leakage through Layer 5	0.000553	2.0058	0.00
Average Head on Top of Layer 4	1.8443	---	---
Change in Water Storage	-0.8506	-3,087.6	-2.62
Soil Water at Start of Year	294.4129	1,068,718.7	905.89
Soil Water at End of Year	293.5623	1,065,631.1	903.28
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0763	-277.1	-0.23

Daily Output for Year 15

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 11/29/2022 9:52

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.040	0.1980	1.7492	0.0002	1.44E-06
2			0.48	0.136	0.046	0.2143	1.7486	0.0002	1.44E-06
3			0.00	0.000	0.158	0.2122	1.7479	0.0002	1.44E-06
4			0.00	0.000	0.076	0.2047	1.7473	0.0002	1.44E-06
5			0.00	0.000	0.059	0.1988	1.7467	0.0002	1.44E-06
6			0.00	0.000	0.018	0.1970	1.7461	0.0002	1.44E-06
7			0.00	0.000	0.000	0.1970	1.7455	0.0002	1.44E-06
8			0.02	0.000	0.011	0.1980	1.7449	0.0002	1.44E-06
9			0.04	0.000	0.011	0.2013	1.7443	0.0002	1.44E-06
10	*		0.17	0.000	0.050	0.2033	1.7437	0.0002	1.44E-06
11	*		0.36	0.000	0.018	0.2053	1.7431	0.0002	1.44E-06
12	*		0.01	0.000	0.009	0.2072	1.7424	0.0002	1.44E-06
13	*		0.03	0.000	0.023	0.2092	1.7418	0.0002	1.44E-06
14	*		0.00	0.000	0.009	0.2112	1.7412	0.0002	1.44E-06
15	*		0.00	0.000	0.006	0.2132	1.7406	0.0002	1.44E-06
16	*		0.00	0.000	0.018	0.2152	1.7400	0.0002	1.44E-06
17	*		0.00	0.000	0.010	0.2172	1.7394	0.0002	1.43E-06
18	*		0.00	0.000	0.000	0.2192	1.7388	0.0002	1.43E-06
19	*		0.06	0.000	0.000	0.2212	1.7382	0.0002	1.43E-06
20	*		0.00	0.000	0.031	0.2231	1.7376	0.0002	1.43E-06
21	*		0.00	0.000	0.031	0.2251	1.7370	0.0002	1.43E-06
22	*		0.00	0.000	0.022	0.2271	1.7364	0.0002	1.43E-06
23	*		0.34	0.000	0.006	0.2291	1.7357	0.0002	1.43E-06
24	*		0.00	0.000	0.000	0.2311	1.7351	0.0002	1.43E-06

25	*		0.00	0.000	0.033	0.2331	1.7345	0.0002	1.43E-06
26			0.00	0.009	0.028	0.2458	1.7339	0.0002	1.43E-06
27			0.00	0.000	0.049	0.2479	1.7333	0.0002	1.43E-06
28	*		0.00	0.000	0.032	0.2499	1.7327	0.0002	1.43E-06
29	*	*	0.00	0.000	0.015	0.2500	1.7321	0.0002	1.43E-06
30	*	*	0.31	0.000	0.000	0.2500	1.7315	0.0002	1.43E-06
31		*	0.00	0.236	0.028	0.2511	1.7309	0.0002	1.43E-06
32		*	0.00	0.000	0.100	0.2546	1.7303	0.0002	1.43E-06
33		*	0.00	0.000	0.000	0.2547	1.7297	0.0002	1.43E-06
34	*	*	0.00	0.000	0.000	0.2547	1.7291	0.0002	1.43E-06
35		*	0.00	0.000	0.000	0.2547	1.7285	0.0002	1.43E-06
36			0.00	0.000	0.079	0.2468	1.7279	0.0002	1.43E-06
37			0.00	0.000	0.116	0.2352	1.7273	0.0002	1.43E-06
38			0.00	0.000	0.094	0.2259	1.7266	0.0002	1.42E-06
39			0.00	0.000	0.098	0.2161	1.7260	0.0002	1.42E-06
40			0.00	0.000	0.155	0.2006	1.7254	0.0002	1.42E-06
41			0.00	0.000	0.028	0.1978	1.7248	0.0002	1.42E-06
42			0.00	0.000	0.005	0.1973	1.7242	0.0002	1.42E-06
43			0.00	0.000	0.003	0.1970	1.7236	0.0002	1.42E-06
44			0.03	0.000	0.011	0.1988	1.7230	0.0002	1.42E-06
45			0.00	0.000	0.003	0.1985	1.7224	0.0002	1.42E-06
46	*		0.19	0.000	0.041	0.2005	1.7218	0.0002	1.42E-06
47			0.00	0.000	0.091	0.2048	1.7212	0.0002	1.42E-06
48			0.00	0.000	0.013	0.2035	1.7206	0.0002	1.42E-06
49			0.00	0.000	0.015	0.2020	1.7200	0.0002	1.42E-06
50			0.41	0.117	0.034	0.2165	1.7194	0.0002	1.42E-06
51			0.00	0.000	0.147	0.2135	1.7188	0.0002	1.42E-06
52			0.00	0.000	0.018	0.2117	1.7182	0.0002	1.42E-06
53			0.00	0.000	0.015	0.2102	1.7176	0.0002	1.42E-06
54			0.03	0.000	0.022	0.2107	1.7170	0.0002	1.42E-06
55			0.00	0.000	0.015	0.2092	1.7164	0.0002	1.42E-06
56			0.00	0.000	0.016	0.2076	1.7158	0.0002	1.42E-06

57		0.00	0.000	0.014	0.2062	1.7152	0.0002	1.42E-06
58		0.00	0.000	0.013	0.2049	1.7146	0.0002	1.42E-06
59		0.00	0.000	0.012	0.2036	1.7140	0.0002	1.42E-06
60		0.00	0.000	0.012	0.2025	1.7134	0.0002	1.41E-06
61		0.00	0.000	0.011	0.2014	1.7128	0.0002	1.41E-06
62		0.00	0.000	0.011	0.2003	1.7122	0.0002	1.41E-06
63	*	0.00	0.000	0.011	0.1992	1.7116	0.0002	1.41E-06
64		0.00	0.000	0.010	0.1982	1.7110	0.0002	1.41E-06
65	*	0.00	0.000	0.009	0.1973	1.7104	0.0002	1.41E-06
66	*	0.00	0.000	0.000	0.1973	1.7098	0.0002	1.41E-06
67	*	0.00	0.000	0.000	0.1973	1.7092	0.0002	1.41E-06
68		0.00	0.000	0.003	0.1970	1.7086	0.0002	1.41E-06
69		0.00	0.000	0.000	0.1970	1.7080	0.0002	1.41E-06
70		0.00	0.000	0.000	0.1970	1.7074	0.0002	1.41E-06
71		0.00	0.000	0.000	0.1970	1.7068	0.0002	1.41E-06
72		0.00	0.000	0.000	0.1970	1.7062	0.0002	1.41E-06
73		0.00	0.000	0.000	0.1970	1.7056	0.0002	1.41E-06
74		0.00	0.000	0.000	0.1970	1.7050	0.0002	1.41E-06
75	*	0.00	0.000	0.000	0.1970	1.7044	0.0002	1.41E-06
76	*	0.00	0.000	0.000	0.1971	1.7038	0.0002	1.41E-06
77		0.00	0.000	0.001	0.1970	1.7032	0.0002	1.41E-06
78		0.00	0.000	0.000	0.1970	1.7026	0.0002	1.41E-06
79		0.00	0.000	0.002	0.1970	1.7020	0.0002	1.41E-06
80		0.00	0.000	0.000	0.1970	1.7014	0.0002	1.41E-06
81		0.00	0.000	0.000	0.1970	1.7008	0.0002	1.41E-06
82		0.00	0.000	0.000	0.1970	1.7003	0.0002	1.40E-06
83		0.00	0.000	0.000	0.1970	1.6997	0.0002	1.40E-06
84		0.15	0.002	0.013	0.2100	1.6991	0.0002	1.40E-06
85		0.14	0.005	0.015	0.2213	1.6985	0.0002	1.40E-06
86		0.01	0.000	0.014	0.2210	1.6979	0.0002	1.40E-06
87		0.00	0.000	0.008	0.2203	1.6973	0.0002	1.40E-06
88		0.00	0.000	0.008	0.2195	1.6967	0.0002	1.40E-06

89	*	0.00	0.000	0.007	0.2188	1.6961	0.0002	1.40E-06
90		0.00	0.000	0.007	0.2181	1.6955	0.0002	1.40E-06
91	*	0.00	0.000	0.007	0.2174	1.6949	0.0002	1.40E-06
92		0.00	0.000	0.007	0.2167	1.6943	0.0002	1.40E-06
93	*	1.02	0.000	0.044	0.2187	1.6937	0.0002	1.40E-06
94	*	0.17	0.000	0.028	0.2206	1.6931	0.0002	1.40E-06
95		0.04	0.067	0.000	0.2334	1.6925	0.0002	1.40E-06
96		0.06	0.462	0.035	0.2450	1.6919	0.0002	1.40E-06
97		0.00	0.000	0.311	0.2502	1.6913	0.0002	1.40E-06
98		0.86	0.371	0.107	0.2628	1.6907	0.0002	1.40E-06
99		0.01	0.000	0.149	0.2745	1.6902	0.0002	1.40E-06
100		0.00	0.000	0.287	0.2458	1.6896	0.0002	1.40E-06
101		0.00	0.000	0.133	0.2325	1.6890	0.0002	1.40E-06
102		0.00	0.000	0.273	0.2052	1.6884	0.0002	1.40E-06
103		0.00	0.000	0.070	0.1982	1.6878	0.0002	1.40E-06
104		0.00	0.000	0.008	0.1970	1.6956	0.0002	1.40E-06
105		0.00	0.000	0.000	0.1970	1.7000	0.0002	1.40E-06
106	*	0.00	0.000	0.000	0.1970	1.6994	0.0002	1.40E-06
107		0.00	0.000	0.000	0.1970	1.6989	0.0002	1.40E-06
108	*	0.00	0.000	0.000	0.1970	1.6983	0.0002	1.40E-06
109		0.00	0.000	0.000	0.1970	1.6977	0.0002	1.40E-06
110		0.00	0.000	0.000	0.1970	1.6971	0.0002	1.40E-06
111		0.00	0.000	0.000	0.1970	1.6965	0.0002	1.40E-06
112	*	0.00	0.000	0.000	0.1970	1.6959	0.0002	1.40E-06
113	*	0.00	0.000	0.000	0.1970	1.6953	0.0002	1.40E-06
114	*	0.00	0.000	0.000	0.1970	1.6947	0.0002	1.40E-06
115	*	0.45	0.000	0.042	0.1990	1.6941	0.0002	1.40E-06
116	*	0.02	0.000	0.000	0.2010	1.6935	0.0002	1.40E-06
117		0.07	0.162	0.009	0.2137	1.6929	0.0002	1.40E-06
118		0.00	0.000	0.171	0.2128	1.6923	0.0002	1.40E-06
119		0.00	0.000	0.014	0.2113	1.6917	0.0002	1.40E-06
120		0.43	0.127	0.028	0.2262	1.6912	0.0002	1.40E-06

121	0.08	0.000	0.251	0.2216	1.6906	0.0002	1.40E-06
122	0.92	0.225	0.401	0.2341	1.6900	0.0002	1.40E-06
123	0.00	0.000	0.158	0.2351	1.6894	0.0002	1.40E-06
124	0.00	0.000	0.112	0.2239	1.6888	0.0002	1.40E-06
125	0.00	0.000	0.216	0.2023	1.6882	0.0002	1.40E-06
126	0.00	0.000	0.045	0.1978	1.6876	0.0002	1.40E-06
127	0.00	0.000	0.004	0.1974	1.6870	0.0002	1.39E-06
128	0.00	0.000	0.004	0.1970	1.6864	0.0002	1.39E-06
129	0.05	0.000	0.012	0.2007	1.6859	0.0002	1.39E-06
130	0.00	0.000	0.003	0.2004	1.6853	0.0002	1.39E-06
131	0.47	0.144	0.042	0.2144	1.6847	0.0002	1.39E-06
132	0.03	0.000	0.165	0.2154	1.6841	0.0002	1.39E-06
133	0.05	0.000	0.027	0.2176	1.6835	0.0002	1.39E-06
134	0.00	0.000	0.021	0.2154	1.6829	0.0002	1.39E-06
135	0.00	0.000	0.017	0.2137	1.6823	0.0002	1.39E-06
136	0.00	0.000	0.016	0.2121	1.6817	0.0002	1.39E-06
137	0.15	0.005	0.024	0.2234	1.6811	0.0002	1.39E-06
138	0.00	0.000	0.023	0.2216	1.6805	0.0002	1.39E-06
139	0.00	0.000	0.017	0.2199	1.6800	0.0002	1.39E-06
140	0.02	0.000	0.021	0.2196	1.6794	0.0002	1.39E-06
141	0.00	0.000	0.015	0.2181	1.6788	0.0002	1.39E-06
142	0.18	0.017	0.022	0.2306	1.6782	0.0002	1.39E-06
143	0.24	0.047	0.043	0.2421	1.6776	0.0002	1.39E-06
144	0.28	0.030	0.277	0.2414	1.6770	0.0002	1.39E-06
145	0.15	0.011	0.092	0.2482	1.6764	0.0002	1.39E-06
146	0.95	0.431	0.146	0.2597	1.6758	0.0002	1.39E-06
147	0.29	0.055	0.347	0.2714	1.6753	0.0002	1.39E-06
148	0.26	0.035	0.326	0.2631	1.6747	0.0002	1.39E-06
149	0.00	0.000	0.262	0.2396	1.6741	0.0002	1.39E-06
150	0.92	0.345	0.142	0.2542	1.6735	0.0002	1.38E-06
151	0.04	0.044	0.129	0.2658	1.6729	0.0002	1.38E-06
152	0.09	0.000	0.218	0.2579	1.6723	0.0002	1.38E-06

153	2.31	1.355	0.108	0.2712	1.6718	0.0002	1.38E-06
154	0.03	0.189	0.250	0.2828	1.6712	0.0002	1.38E-06
155	0.36	0.156	0.159	0.2944	1.6706	0.0002	1.38E-06
156	0.00	0.000	0.163	0.2902	1.6700	0.0002	1.38E-06
157	0.00	0.000	0.184	0.2718	1.6694	0.0002	1.38E-06
158	0.00	0.000	0.264	0.2454	1.6688	0.0002	1.38E-06
159	0.57	0.046	0.349	0.2584	1.6682	0.0002	1.38E-06
160	0.00	0.000	0.286	0.2343	1.6677	0.0002	1.38E-06
161	0.00	0.000	0.237	0.2106	1.6671	0.0002	1.38E-06
162	0.00	0.000	0.112	0.1993	1.6676	0.0002	1.38E-06
163	0.00	0.000	0.023	0.1970	1.6701	0.0002	1.38E-06
164	0.00	0.000	0.000	0.1970	1.6695	0.0002	1.38E-06
165	0.00	0.000	0.000	0.1970	1.6690	0.0002	1.38E-06
166	0.00	0.000	0.000	0.1970	1.6684	0.0002	1.38E-06
167	1.87	0.957	0.041	0.2131	1.6678	0.0002	1.38E-06
168	0.00	0.151	0.288	0.2248	1.6672	0.0002	1.38E-06
169	0.00	0.000	0.222	0.2177	1.6666	0.0002	1.38E-06
170	0.00	0.000	0.166	0.2011	1.6660	0.0002	1.38E-06
171	0.00	0.000	0.035	0.1976	1.6655	0.0002	1.38E-06
172	0.00	0.000	0.004	0.1973	1.6649	0.0002	1.38E-06
173	0.61	0.169	0.109	0.2136	1.6643	0.0002	1.38E-06
174	0.11	0.000	0.235	0.2180	1.6637	0.0002	1.38E-06
175	0.00	0.000	0.125	0.2055	1.6631	0.0002	1.38E-06
176	0.00	0.000	0.063	0.1992	1.6625	0.0002	1.38E-06
177	0.00	0.000	0.022	0.1971	1.6620	0.0002	1.38E-06
178	0.00	0.000	0.001	0.1970	1.6614	0.0002	1.38E-06
179	0.00	0.000	0.000	0.1970	1.6608	0.0002	1.37E-06
180	1.37	0.640	0.050	0.2131	1.6602	0.0002	1.37E-06
181	0.00	0.025	0.355	0.2247	1.6596	0.0002	1.37E-06
182	0.00	0.000	0.178	0.2095	1.6591	0.0002	1.37E-06
183	0.17	0.003	0.141	0.2114	1.6585	0.0002	1.37E-06
184	0.00	0.000	0.123	0.1994	1.6579	0.0002	1.37E-06

185	0.00	0.000	0.017	0.1977	1.6573	0.0002	1.37E-06
186	0.00	0.000	0.006	0.1971	1.6567	0.0002	1.37E-06
187	0.01	0.000	0.013	0.1973	1.6562	0.0002	1.37E-06
188	0.12	0.000	0.013	0.2078	1.6556	0.0002	1.37E-06
189	0.14	0.000	0.027	0.2186	1.6550	0.0002	1.37E-06
190	0.62	0.235	0.043	0.2308	1.6544	0.0002	1.37E-06
191	0.00	0.000	0.274	0.2254	1.6538	0.0002	1.37E-06
192	0.01	0.000	0.187	0.2078	1.6533	0.0002	1.37E-06
193	1.15	0.405	0.254	0.2235	1.6527	0.0002	1.37E-06
194	0.00	0.000	0.219	0.2349	1.6521	0.0002	1.37E-06
195	0.00	0.000	0.230	0.2119	1.6515	0.0002	1.37E-06
196	0.55	0.061	0.284	0.2262	1.6509	0.0002	1.37E-06
197	0.21	0.035	0.134	0.2325	1.6504	0.0002	1.37E-06
198	0.00	0.000	0.253	0.2108	1.6498	0.0002	1.37E-06
199	0.04	0.000	0.147	0.1999	1.6492	0.0002	1.37E-06
200	0.07	0.000	0.051	0.2020	1.6488	0.0002	1.37E-06
201	0.33	0.032	0.157	0.2128	1.6487	0.0002	1.37E-06
202	0.57	0.084	0.319	0.2245	1.6481	0.0002	1.37E-06
203	0.00	0.000	0.167	0.2158	1.6475	0.0002	1.36E-06
204	0.00	0.000	0.093	0.2065	1.6469	0.0002	1.36E-06
205	0.00	0.000	0.071	0.1995	1.6464	0.0002	1.36E-06
206	0.12	0.000	0.040	0.2075	1.6458	0.0002	1.36E-06
207	0.00	0.000	0.026	0.2049	1.6452	0.0002	1.36E-06
208	0.00	0.000	0.035	0.2015	1.6446	0.0002	1.36E-06
209	0.00	0.000	0.027	0.1988	1.6441	0.0002	1.36E-06
210	0.00	0.000	0.012	0.1976	1.6435	0.0002	1.36E-06
211	0.00	0.000	0.006	0.1970	1.6429	0.0002	1.36E-06
212	0.00	0.000	0.000	0.1970	1.6423	0.0002	1.36E-06
213	0.00	0.000	0.000	0.1970	1.6418	0.0002	1.36E-06
214	0.00	0.000	0.000	0.1970	1.6412	0.0002	1.36E-06
215	0.00	0.000	0.000	0.1970	1.6406	0.0002	1.36E-06
216	0.00	0.000	0.000	0.1970	1.6400	0.0002	1.36E-06

217	0.00	0.000	0.000	0.1970	1.6395	0.0002	1.36E-06
218	0.00	0.000	0.000	0.1970	1.6389	0.0002	1.36E-06
219	0.00	0.000	0.000	0.1970	1.6383	0.0002	1.36E-06
220	0.54	0.173	0.030	0.2131	1.6377	0.0002	1.36E-06
221	0.00	0.000	0.231	0.2075	1.6372	0.0002	1.36E-06
222	0.00	0.000	0.019	0.2056	1.6366	0.0002	1.36E-06
223	0.00	0.000	0.020	0.2036	1.6360	0.0002	1.36E-06
224	0.00	0.000	0.017	0.2020	1.6354	0.0002	1.36E-06
225	0.00	0.000	0.025	0.1995	1.6349	0.0002	1.36E-06
226	0.00	0.000	0.025	0.1970	1.6343	0.0002	1.35E-06
227	0.00	0.000	0.000	0.1970	1.6337	0.0002	1.35E-06
228	0.00	0.000	0.000	0.1970	1.6332	0.0002	1.35E-06
229	0.00	0.000	0.000	0.1970	1.6326	0.0002	1.35E-06
230	0.00	0.000	0.000	0.1970	1.6320	0.0002	1.35E-06
231	0.00	0.000	0.000	0.1970	1.6314	0.0002	1.35E-06
232	0.00	0.000	0.000	0.1970	1.6309	0.0002	1.35E-06
233	0.50	0.156	0.029	0.2129	1.6303	0.0002	1.35E-06
234	0.00	0.000	0.181	0.2103	1.6297	0.0002	1.35E-06
235	0.00	0.000	0.109	0.1995	1.6292	0.0002	1.35E-06
236	0.00	0.000	0.025	0.1970	1.6286	0.0002	1.35E-06
237	0.00	0.000	0.000	0.1970	1.6280	0.0002	1.35E-06
238	0.57	0.174	0.061	0.2129	1.6274	0.0002	1.35E-06
239	0.13	0.000	0.227	0.2206	1.6269	0.0002	1.35E-06
240	0.00	0.000	0.050	0.2157	1.6263	0.0002	1.35E-06
241	0.00	0.000	0.132	0.2024	1.6257	0.0002	1.35E-06
242	0.55	0.116	0.158	0.2181	1.6252	0.0002	1.35E-06
243	0.00	0.000	0.182	0.2115	1.6246	0.0002	1.35E-06
244	0.00	0.000	0.100	0.2015	1.6240	0.0002	1.35E-06
245	0.00	0.000	0.037	0.1978	1.6235	0.0002	1.35E-06
246	0.13	0.000	0.025	0.2083	1.6229	0.0002	1.35E-06
247	0.20	0.026	0.034	0.2192	1.6223	0.0002	1.35E-06
248	0.00	0.000	0.047	0.2172	1.6218	0.0002	1.35E-06

249	1.19	0.562	0.052	0.2298	1.6212	0.0002	1.34E-06
250	0.00	0.064	0.203	0.2415	1.6206	0.0002	1.34E-06
251	0.61	0.222	0.149	0.2531	1.6201	0.0002	1.34E-06
252	0.00	0.000	0.192	0.2522	1.6195	0.0002	1.34E-06
253	0.00	0.000	0.200	0.2322	1.6189	0.0002	1.34E-06
254	0.00	0.000	0.275	0.2046	1.6184	0.0002	1.34E-06
255	0.01	0.000	0.071	0.1987	1.6178	0.0002	1.34E-06
256	0.00	0.000	0.009	0.1978	1.6172	0.0002	1.34E-06
257	0.00	0.000	0.008	0.1970	1.6167	0.0002	1.34E-06
258	0.13	0.000	0.016	0.2088	1.6161	0.0002	1.34E-06
259	0.11	0.000	0.033	0.2163	1.6155	0.0002	1.34E-06
260	0.29	0.056	0.050	0.2290	1.6150	0.0002	1.34E-06
261	0.20	0.034	0.125	0.2355	1.6144	0.0002	1.34E-06
262	0.00	0.000	0.074	0.2316	1.6138	0.0002	1.34E-06
263	0.00	0.000	0.063	0.2253	1.6133	0.0002	1.34E-06
264	0.00	0.000	0.121	0.2132	1.6127	0.0002	1.34E-06
265	0.00	0.000	0.056	0.2076	1.6121	0.0002	1.34E-06
266	0.01	0.000	0.051	0.2033	1.6116	0.0002	1.34E-06
267	0.01	0.000	0.044	0.1998	1.6110	0.0002	1.34E-06
268	0.00	0.000	0.027	0.1971	1.6104	0.0002	1.34E-06
269	0.00	0.000	0.001	0.1970	1.6099	0.0002	1.34E-06
270	0.00	0.000	0.000	0.1970	1.6093	0.0002	1.34E-06
271	0.00	0.000	0.000	0.1970	1.6087	0.0002	1.34E-06
272	0.06	0.000	0.013	0.2019	1.6082	0.0002	1.33E-06
273	0.00	0.000	0.012	0.2008	1.6076	0.0002	1.33E-06
274	0.04	0.000	0.025	0.2018	1.6071	0.0002	1.33E-06
275	0.13	0.000	0.024	0.2125	1.6065	0.0002	1.33E-06
276	0.10	0.000	0.023	0.2203	1.6059	0.0002	1.33E-06
277	0.00	0.000	0.010	0.2193	1.6054	0.0002	1.33E-06
278	0.00	0.000	0.014	0.2180	1.6048	0.0002	1.33E-06
279	0.00	0.000	0.015	0.2165	1.6042	0.0002	1.33E-06
280	0.00	0.000	0.014	0.2152	1.6037	0.0002	1.33E-06

281	0.00	0.000	0.013	0.2139	1.6031	0.0002	1.33E-06
282	0.03	0.000	0.022	0.2146	1.6026	0.0002	1.33E-06
283	0.00	0.000	0.013	0.2134	1.6020	0.0002	1.33E-06
284	0.00	0.000	0.014	0.2120	1.6014	0.0002	1.33E-06
285	0.00	0.000	0.013	0.2107	1.6009	0.0002	1.33E-06
286	0.00	0.000	0.011	0.2095	1.6003	0.0002	1.33E-06
287	0.07	0.000	0.022	0.2138	1.5998	0.0002	1.33E-06
288	0.00	0.000	0.012	0.2126	1.5992	0.0002	1.33E-06
289	0.77	0.314	0.026	0.2263	1.5986	0.0002	1.33E-06
290	0.29	0.116	0.233	0.2380	1.5981	0.0002	1.33E-06
291	0.03	0.000	0.193	0.2337	1.5975	0.0002	1.33E-06
292	0.00	0.000	0.060	0.2277	1.5970	0.0002	1.33E-06
293	0.00	0.000	0.073	0.2204	1.5964	0.0002	1.33E-06
294	0.00	0.000	0.059	0.2145	1.5958	0.0002	1.33E-06
295	0.00	0.000	0.051	0.2094	1.5953	0.0002	1.32E-06
296	0.00	0.000	0.050	0.2044	1.5947	0.0002	1.32E-06
297	0.00	0.000	0.067	0.1977	1.5942	0.0002	1.32E-06
298	0.00	0.000	0.006	0.1972	1.5936	0.0002	1.32E-06
299	0.00	0.000	0.002	0.1970	1.5930	0.0002	1.32E-06
300	0.00	0.000	0.000	0.1970	1.5925	0.0002	1.32E-06
301	0.00	0.000	0.000	0.1970	1.5919	0.0002	1.32E-06
302	0.00	0.000	0.000	0.1970	1.5914	0.0002	1.32E-06
303	0.00	0.000	0.000	0.1970	1.5908	0.0002	1.32E-06
304	0.00	0.000	0.000	0.1970	1.5903	0.0002	1.32E-06
305	0.00	0.000	0.000	0.1970	1.5897	0.0002	1.32E-06
306	0.00	0.000	0.000	0.1970	1.5891	0.0002	1.32E-06
307	0.00	0.000	0.000	0.1970	1.5886	0.0002	1.32E-06
308	0.43	0.115	0.034	0.2133	1.5880	0.0002	1.32E-06
309	0.00	0.000	0.126	0.2124	1.5875	0.0002	1.32E-06
310	0.00	0.000	0.014	0.2110	1.5869	0.0002	1.32E-06
311	0.00	0.000	0.013	0.2097	1.5864	0.0002	1.32E-06
312	0.00	0.000	0.013	0.2084	1.5858	0.0002	1.32E-06

313		0.00	0.000	0.012	0.2072	1.5853	0.0002	1.32E-06
314		0.00	0.000	0.012	0.2060	1.5847	0.0002	1.32E-06
315		0.00	0.000	0.012	0.2048	1.5841	0.0002	1.32E-06
316		0.00	0.000	0.011	0.2037	1.5836	0.0002	1.32E-06
317		0.00	0.000	0.011	0.2026	1.5830	0.0002	1.32E-06
318		0.00	0.000	0.011	0.2016	1.5825	0.0002	1.32E-06
319		0.35	0.085	0.026	0.2168	1.5819	0.0002	1.31E-06
320		0.19	0.032	0.122	0.2262	1.5814	0.0002	1.31E-06
321		0.12	0.000	0.114	0.2300	1.5808	0.0002	1.31E-06
322		0.00	0.000	0.046	0.2255	1.5803	0.0002	1.31E-06
323		0.00	0.000	0.050	0.2205	1.5797	0.0002	1.31E-06
324	*	0.24	0.000	0.028	0.2225	1.5792	0.0002	1.31E-06
325	*	0.00	0.000	0.018	0.2245	1.5786	0.0002	1.31E-06
326	*	0.09	0.000	0.000	0.2265	1.5780	0.0002	1.31E-06
327		0.00	0.026	0.048	0.2392	1.5775	0.0002	1.31E-06
328		0.00	0.000	0.117	0.2302	1.5769	0.0002	1.31E-06
329		0.14	0.000	0.097	0.2343	1.5764	0.0002	1.31E-06
330		0.19	0.021	0.110	0.2378	1.5758	0.0002	1.31E-06
331		0.00	0.000	0.109	0.2291	1.5753	0.0002	1.31E-06
332		0.00	0.000	0.043	0.2247	1.5748	0.0002	1.31E-06
333		0.45	0.126	0.059	0.2390	1.5742	0.0002	1.31E-06
334	*	0.00	0.000	0.027	0.2390	1.5737	0.0002	1.31E-06
335	*	0.00	0.000	0.010	0.2390	1.5731	0.0002	1.31E-06
336	*	0.00	0.000	0.007	0.2390	1.5726	0.0002	1.31E-06
337	*	0.02	0.000	0.025	0.2463	1.5720	0.0002	1.31E-06
338		0.10	0.000	0.067	0.2495	1.5715	0.0002	1.31E-06
339	*	0.04	0.000	0.035	0.2495	1.5709	0.0002	1.31E-06
340		0.69	0.267	0.078	0.2627	1.5704	0.0002	1.31E-06
341		0.00	0.000	0.103	0.2742	1.5698	0.0002	1.31E-06
342		0.00	0.000	0.087	0.2656	1.5693	0.0002	1.31E-06
343		0.00	0.000	0.067	0.2589	1.5687	0.0002	1.30E-06
344		0.07	0.000	0.071	0.2592	1.5682	0.0002	1.30E-06

345		0.02	0.000	0.087	0.2523	1.5676	0.0002	1.30E-06
346		0.00	0.000	0.049	0.2474	1.5671	0.0002	1.30E-06
347	*	0.00	0.000	0.000	0.2474	1.5665	0.0002	1.30E-06
348	*	0.00	0.000	0.000	0.2474	1.5660	0.0002	1.30E-06
349		0.00	0.000	0.076	0.2398	1.5654	0.0002	1.30E-06
350		0.00	0.000	0.063	0.2335	1.5649	0.0002	1.30E-06
351		0.00	0.000	0.097	0.2238	1.5649	0.0002	1.30E-06
352		0.00	0.000	0.045	0.2193	1.5643	0.0002	1.30E-06
353		0.00	0.000	0.045	0.2150	1.5638	0.0002	1.30E-06
354		0.00	0.000	0.055	0.2096	1.5632	0.0002	1.30E-06
355		0.00	0.000	0.046	0.2050	1.5627	0.0002	1.30E-06
356		0.00	0.000	0.048	0.2003	1.5621	0.0002	1.30E-06
357		0.00	0.000	0.017	0.1986	1.5616	0.0002	1.30E-06
358		0.03	0.000	0.029	0.1989	1.5610	0.0002	1.30E-06
359		0.00	0.000	0.003	0.1986	1.5605	0.0002	1.30E-06
360		0.00	0.000	0.006	0.1980	1.5599	0.0002	1.30E-06
361		0.00	0.000	0.005	0.1975	1.5594	0.0002	1.30E-06
362		0.00	0.000	0.004	0.1971	1.5588	0.0002	1.30E-06
363	*	0.41	0.000	0.023	0.1991	1.5583	0.0002	1.30E-06
364		0.02	0.110	0.023	0.2134	1.5577	0.0002	1.30E-06
365		0.08	0.000	0.072	0.2249	1.5572	0.0002	1.30E-06

* = Frozen (air or soil)

Annual Totals for Year 15			
	inches	cubic feet	percent
Precipitation	32.76	118,911.8	100.00
Runoff	10.423	37,834.3	31.82
Evapotranspiration	22.169	80,474.2	67.68
Recirculation into Layer 1	0.0685	248.5	0.21
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0685	248.5	0.21
Percolation/Leakage through Layer 5	0.000500	1.8148	0.00
Average Head on Top of Layer 4	1.6541	---	---
Change in Water Storage	0.1657	601.5	0.51
Soil Water at Start of Year	293.5623	1,065,631.1	896.15
Soil Water at End of Year	293.7280	1,066,232.6	896.66
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0685	-248.6	-0.21

Average Annual Totals Summary

Title: AEL Lateral Expansion
Simulated on: 11/29/2022 9:52

	Average Annual Totals for Years 1 - 15*			
	(inches)	[std dev]	(cubic feet)	(percent)
Precipitation	36.87	[6.7]	133,840.4	100.00
Runoff	13.369	[3.295]	48,528.8	36.26
Evapotranspiration	23.487	[3.814]	85,258.1	63.70
Subprofile1				
Recirculation into Layer 1	0.0448	[0.0182]	162.6	0.12
Lateral drainage collected from Layer 3	0.0000	[0]	0.0000	0.00
Drainage recirculated from Layer 3	0.0448	[0.0182]	162.6	0.12
Percolation/leakage through Layer 5	0.000337	[0.000126]	1.2225	0.00
Average Head on Top of Layer 4	1.0817	[0.4395]	---	---
Water storage				
Change in water storage	0.0144	[0.512]	52.2	0.04

* Note: Average inches are converted to volume based on the user-specified area.

Peak Values Summary

Title: AEL Lateral Expansion
Simulated on: 11/29/2022 9:52

	Peak Values for Years 1 - 15*		
	(inches)		(cubic feet)
Precipitation	3.66		13,287.7
Runoff	2.179		7,911.5
Subprofile1			
Drainage Recirculated into Layer 1	0.0002		0.7985
Drainage collected from Layer 3	0.0000		0.0000
Drainage recirculated from Layer 3	0.0002		0.7985
Percolation/leakage through Layer 5	0.000002		0.0058
Average head on Layer 4	1.9401		---
Maximum head on Layer 4	2.8386		---
Location of maximum head in Layer 3	67.11	(feet from drain)	
Other Parameters			
Snow water	3.0963		11,239.6
Maximum vegetation soil water	0.3605	(vol/vol)	
Minimum vegetation soil water	0.1970	(vol/vol)	

Final Water Storage in Landfill Profile at End of Simulation Period

Title: AEL Lateral Expansion
Simulated on: 11/29/2022 9:53
Simulation period: 15 years

	Final Water Storage	
Layer	(inches)	(vol/vol)
1	1.8604	0.3101
2	279.5400	0.2912
3	2.0795	0.1733
4	0.0000	0.0000
5	10.2480	0.4270
Snow water	0.0000	---

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 4.0 BETA (2018)
DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Title: AEL Lateral Expansion **Simulated On:** 6/29/2023 9:04

Layer 1

Type 1 - Vertical Percolation Layer (Cover Soil)
SiCL - Silty Clay Loam (Moderate)
Material Texture Number 26

Thickness	=	12	inches
Porosity	=	0.445	vol/vol
Field Capacity	=	0.393	vol/vol
Wilting Point	=	0.277	vol/vol
Initial Soil Water Content	=	0.3066	vol/vol
Effective Sat. Hyd. Conductivity	=	1.90E-06	cm/sec

Note: 100% of drainage collected from Layer 3 is recirculated into this layer.

Layer 2

Type 1 - Vertical Percolation Layer (Waste)
Municipal Solid Waste (MSW) (900 pcy)
Material Texture Number 18

Thickness	=	4764	inches
Porosity	=	0.671	vol/vol
Field Capacity	=	0.292	vol/vol
Wilting Point	=	0.077	vol/vol
Initial Soil Water Content	=	0.292	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-03	cm/sec

Layer 3

Type 2 - Lateral Drainage Layer
LFS Loamy Fine Sand
Material Texture Number 5

Thickness	=	12	inches
Porosity	=	0.457	vol/vol
Field Capacity	=	0.131	vol/vol
Wilting Point	=	0.058	vol/vol
Initial Soil Water Content	=	0.1316	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-03	cm/sec
Slope	=	0.5	%
Drainage Length	=	250	ft

Note: 100% of drainage collected from this layer is recirculated into Layer 1.

Layer 4

Type 4 - Flexible Membrane Liner

HDPE Membrane

Material Texture Number 35

Thickness	=	0.06	inches
Effective Sat. Hyd. Conductivity	=	2.00E-13	cm/sec
FML Pinhole Density	=	0.5	Holes/Acre
FML Installation Defects	=	1	Holes/Acre
FML Placement Quality	=	3	Good

Layer 5

Type 3 - Barrier Soil Liner

Liner Soil (High)

Material Texture Number 16

Thickness	=	24	inches
Porosity	=	0.427	vol/vol
Field Capacity	=	0.418	vol/vol
Wilting Point	=	0.367	vol/vol
Initial Soil Water Content	=	0.427	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-07	cm/sec

Note: Initial moisture content of the layers and snow water were computed as nearly steady-state values by HELP.

General Design and Evaporative Zone Data

SCS Runoff Curve Number	=	97.1	
Fraction of Area Allowing Runoff	=	100	%
Area projected on a horizontal plane	=	1	acres
Evaporative Zone Depth	=	10	inches
Initial Water in Evaporative Zone	=	2.894	inches
Upper Limit of Evaporative Storage	=	4.45	inches
Lower Limit of Evaporative Storage	=	2.77	inches
Initial Snow Water	=	0	inches
Initial Water in Layer Materials	=	1406.595	inches
Total Initial Water	=	1406.595	inches
Total Subsurface Inflow	=	0	inches/year

Note: SCS Runoff Curve Number was calculated by HELP.

Evapotranspiration and Weather Data

Station Latitude	=	36.15	Degrees

Maximum Leaf Area Index	=	1
Start of Growing Season (Julian Date)	=	74 days
End of Growing Season (Julian Date)	=	319 days
Average Wind Speed	=	10 mph
Average 1st Quarter Relative Humidity	=	63 %
Average 2nd Quarter Relative Humidity	=	66 %
Average 3rd Quarter Relative Humidity	=	69 %
Average 4th Quarter Relative Humidity	=	63 %

Note: Evapotranspiration data was obtained for Sand Springs, Oklahoma

Normal Mean Monthly Precipitation (inches)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
1.360443	1.630784	3.351263	4.428939	4.601378	4.538602
3.993826	2.841239	3.475277	2.797522	2.323377	1.91907

Note: Precipitation was simulated based on HELP V4 weather simulation for:
Lat/Long: 36.15/-96.2

Normal Mean Monthly Temperature (Degrees Fahrenheit)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
44	49	51.8	67	77.1	85.5
91.2	88.2	80.8	71.7	57.6	45.3

Note: Temperature was simulated based on HELP V4 weather simulation for:
Lat/Long: 36.15/-96.2
Solar radiation was simulated based on HELP V4 weather simulation for:
Lat/Long: 36.15/-96.2

Daily Output for Year 1

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.030	0.2863	0.0235	0.0000	3.23E-08
2	*		0.00	0.000	0.028	0.2835	0.0235	0.0000	3.23E-08
3	*		0.00	0.000	0.000	0.2835	0.0235	0.0000	3.23E-08
4	*		0.00	0.000	0.000	0.2835	0.0235	0.0000	3.23E-08
5	*		0.00	0.000	0.000	0.2835	0.0234	0.0000	3.23E-08
6	*		0.00	0.000	0.000	0.2835	0.0234	0.0000	3.23E-08
7			0.11	0.000	0.058	0.2882	0.0234	0.0000	3.23E-08
8			0.08	0.000	0.068	0.2894	0.0234	0.0000	3.23E-08
9			0.28	0.092	0.113	0.2972	0.0234	0.0000	3.23E-08
10			0.10	0.000	0.048	0.3028	0.0234	0.0000	3.23E-08
11			0.03	0.000	0.071	0.2991	0.0234	0.0000	3.23E-08
12			0.03	0.000	0.055	0.2970	0.0234	0.0000	3.22E-08
13			0.00	0.000	0.079	0.2891	0.0234	0.0000	3.22E-08
14			0.00	0.000	0.087	0.2804	0.0234	0.0000	3.22E-08
15			0.00	0.000	0.027	0.2777	0.0234	0.0000	3.22E-08
16			0.00	0.000	0.006	0.2771	0.0235	0.0000	3.23E-08
17			0.00	0.000	0.001	0.2770	0.0235	0.0000	3.24E-08
18			0.03	0.000	0.009	0.2796	0.0235	0.0000	3.23E-08
19	*		0.16	0.000	0.051	0.2816	0.0235	0.0000	3.23E-08
20			0.03	0.000	0.082	0.2848	0.0235	0.0000	3.23E-08
21			0.00	0.000	0.015	0.2834	0.0235	0.0000	3.23E-08
22			0.00	0.000	0.017	0.2817	0.0235	0.0000	3.23E-08
23			0.02	0.000	0.024	0.2810	0.0235	0.0000	3.23E-08
24			0.10	0.000	0.022	0.2893	0.0235	0.0000	3.23E-08

25		0.00	0.000	0.011	0.2882	0.0235	0.0000	3.23E-08
26		0.00	0.000	0.012	0.2870	0.0235	0.0000	3.23E-08
27	*	0.00	0.000	0.014	0.2857	0.0235	0.0000	3.23E-08
28		0.00	0.000	0.013	0.2843	0.0234	0.0000	3.23E-08
29		0.00	0.000	0.013	0.2830	0.0234	0.0000	3.23E-08
30		0.00	0.000	0.012	0.2818	0.0234	0.0000	3.23E-08
31	*	0.00	0.000	0.000	0.2818	0.0234	0.0000	3.23E-08
32	*	0.00	0.000	0.000	0.2818	0.0234	0.0000	3.23E-08
33	*	0.00	0.000	0.000	0.2818	0.0234	0.0000	3.22E-08
34	*	0.00	0.000	0.000	0.2818	0.0234	0.0000	3.22E-08
35	*	0.00	0.000	0.000	0.2818	0.0234	0.0000	3.22E-08
36	*	0.00	0.000	0.000	0.2818	0.0234	0.0000	3.22E-08
37	*	0.00	0.000	0.000	0.2818	0.0234	0.0000	3.22E-08
38	*	0.00	0.000	0.000	0.2818	0.0234	0.0000	3.22E-08
39	*	0.00	0.000	0.012	0.2806	0.0234	0.0000	3.22E-08
40	*	0.00	0.000	0.011	0.2795	0.0234	0.0000	3.22E-08
41		0.00	0.000	0.011	0.2783	0.0234	0.0000	3.22E-08
42	*	0.00	0.000	0.010	0.2773	0.0234	0.0000	3.22E-08
43		0.00	0.000	0.002	0.2771	0.0234	0.0000	3.22E-08
44		0.00	0.000	0.000	0.2770	0.0233	0.0000	3.22E-08
45		0.14	0.003	0.012	0.2899	0.0233	0.0000	3.22E-08
46		0.00	0.000	0.006	0.2893	0.0233	0.0000	3.22E-08
47		0.00	0.000	0.009	0.2884	0.0233	0.0000	3.22E-08
48		0.00	0.000	0.009	0.2875	0.0233	0.0000	3.22E-08
49		0.00	0.000	0.009	0.2866	0.0233	0.0000	3.22E-08
50		0.00	0.000	0.009	0.2857	0.0233	0.0000	3.21E-08
51	*	0.00	0.000	0.009	0.2848	0.0233	0.0000	3.21E-08
52		0.00	0.000	0.008	0.2840	0.0233	0.0000	3.21E-08
53		0.02	0.000	0.014	0.2842	0.0233	0.0000	3.21E-08
54		0.00	0.000	0.010	0.2834	0.0233	0.0000	3.21E-08
55		0.06	0.000	0.014	0.2879	0.0233	0.0000	3.21E-08
56		0.00	0.000	0.009	0.2870	0.0233	0.0000	3.21E-08

57		0.00	0.000	0.010	0.2860	0.0233	0.0000	3.21E-08
58		0.00	0.000	0.008	0.2853	0.0233	0.0000	3.21E-08
59	*	0.00	0.000	0.000	0.2853	0.0233	0.0000	3.21E-08
60	*	0.00	0.000	0.007	0.2845	0.0232	0.0000	3.21E-08
61	*	0.00	0.000	0.007	0.2838	0.0232	0.0000	3.21E-08
62	*	0.00	0.000	0.007	0.2831	0.0232	0.0000	3.21E-08
63	*	0.00	0.000	0.012	0.2824	0.0232	0.0000	3.21E-08
64	*	0.04	0.000	0.044	0.2817	0.0232	0.0000	3.21E-08
65		0.00	0.000	0.007	0.2810	0.0232	0.0000	3.21E-08
66		0.00	0.000	0.007	0.2803	0.0232	0.0000	3.20E-08
67		1.67	1.499	0.016	0.2960	0.0232	0.0000	3.20E-08
68		0.00	0.000	0.111	0.2849	0.0232	0.0000	3.20E-08
69		0.00	0.000	0.007	0.2843	0.0232	0.0000	3.20E-08
70		0.00	0.000	0.008	0.2834	0.0232	0.0000	3.20E-08
71		0.38	0.215	0.015	0.2986	0.0232	0.0000	3.20E-08
72		1.05	0.855	0.082	0.3102	0.0232	0.0000	3.20E-08
73		0.00	0.000	0.087	0.3015	0.0232	0.0000	3.20E-08
74	*	0.00	0.000	0.000	0.3015	0.0232	0.0000	3.20E-08
75		0.00	0.000	0.057	0.2958	0.0232	0.0000	3.20E-08
76		0.03	0.000	0.081	0.2903	0.0231	0.0000	3.20E-08
77		1.82	1.612	0.072	0.3038	0.0231	0.0000	3.20E-08
78		0.67	0.442	0.111	0.3154	0.0231	0.0000	3.20E-08
79		0.00	0.000	0.100	0.3054	0.0231	0.0000	3.20E-08
80		0.00	0.000	0.058	0.2996	0.0231	0.0000	3.20E-08
81		0.39	0.129	0.231	0.3024	0.0231	0.0000	3.20E-08
82		0.43	0.179	0.135	0.3140	0.0231	0.0000	3.19E-08
83	*	0.00	0.000	0.000	0.3140	0.0231	0.0000	3.19E-08
84	*	0.23	0.000	0.039	0.3160	0.0231	0.0000	3.19E-08
85		0.00	0.005	0.111	0.3219	0.0231	0.0000	3.19E-08
86		0.48	0.294	0.070	0.3340	0.0231	0.0000	3.19E-08
87		0.00	0.000	0.181	0.3158	0.0231	0.0000	3.19E-08
88		0.00	0.000	0.084	0.3074	0.0231	0.0000	3.19E-08

89	*	0.01	0.000	0.053	0.3027	0.0231	0.0000	3.19E-08
90		0.12	0.000	0.091	0.3057	0.0230	0.0000	3.19E-08
91		0.00	0.000	0.184	0.2873	0.0230	0.0000	3.19E-08
92		0.00	0.000	0.083	0.2790	0.0230	0.0000	3.19E-08
93	*	0.25	0.000	0.043	0.2810	0.0230	0.0000	3.19E-08
94		0.00	0.001	0.095	0.2903	0.0230	0.0000	3.19E-08
95		0.10	0.000	0.043	0.2960	0.0237	0.0000	3.25E-08
96		0.19	0.038	0.087	0.3025	0.0243	0.0000	3.31E-08
97		0.87	0.645	0.105	0.3141	0.0243	0.0000	3.31E-08
98		0.02	0.000	0.110	0.3049	0.0248	0.0000	3.36E-08
99		0.00	0.000	0.112	0.2937	0.0250	0.0000	3.38E-08
100		0.00	0.000	0.107	0.2830	0.0250	0.0000	3.38E-08
101		0.30	0.127	0.060	0.2941	0.0250	0.0000	3.38E-08
102		0.00	0.000	0.117	0.2824	0.0250	0.0000	3.38E-08
103	*	0.10	0.000	0.093	0.2835	0.0250	0.0000	3.38E-08
104		0.00	0.000	0.034	0.2801	0.0250	0.0000	3.38E-08
105		0.00	0.000	0.019	0.2782	0.0250	0.0000	3.37E-08
106		0.00	0.000	0.009	0.2773	0.0249	0.0000	3.37E-08
107		0.00	0.000	0.003	0.2771	0.0249	0.0000	3.37E-08
108		0.00	0.000	0.000	0.2770	0.0249	0.0000	3.37E-08
109		0.00	0.000	0.000	0.2770	0.0249	0.0000	3.37E-08
110		0.00	0.000	0.000	0.2770	0.0249	0.0000	3.37E-08
111		0.46	0.280	0.027	0.2924	0.0249	0.0000	3.37E-08
112		0.27	0.094	0.097	0.3007	0.0249	0.0000	3.37E-08
113		0.00	0.000	0.079	0.2928	0.0249	0.0000	3.37E-08
114		0.00	0.000	0.112	0.2816	0.0249	0.0000	3.37E-08
115		0.00	0.000	0.034	0.2782	0.0249	0.0000	3.37E-08
116		0.00	0.000	0.009	0.2773	0.0249	0.0000	3.37E-08
117		0.00	0.000	0.002	0.2771	0.0249	0.0000	3.37E-08
118		0.00	0.000	0.001	0.2770	0.0249	0.0000	3.37E-08
119	*	0.00	0.000	0.000	0.2770	0.0249	0.0000	3.37E-08
120		0.00	0.000	0.000	0.2770	0.0249	0.0000	3.37E-08

121	0.00	0.000	0.000	0.2770	0.0249	0.0000	3.37E-08
122	0.00	0.000	0.000	0.2770	0.0248	0.0000	3.36E-08
123	0.22	0.075	0.016	0.2896	0.0248	0.0000	3.36E-08
124	0.00	0.000	0.009	0.2886	0.0248	0.0000	3.36E-08
125	0.00	0.000	0.015	0.2871	0.0248	0.0000	3.36E-08
126	0.00	0.000	0.014	0.2857	0.0248	0.0000	3.36E-08
127	0.00	0.000	0.013	0.2844	0.0248	0.0000	3.36E-08
128	0.00	0.000	0.013	0.2831	0.0248	0.0000	3.36E-08
129	0.00	0.000	0.013	0.2818	0.0248	0.0000	3.36E-08
130	0.41	0.228	0.023	0.2972	0.0248	0.0000	3.36E-08
131	0.00	0.000	0.015	0.2961	0.0248	0.0000	3.36E-08
132	0.04	0.000	0.019	0.2985	0.0248	0.0000	3.36E-08
133	0.00	0.000	0.013	0.2972	0.0248	0.0000	3.36E-08
134	0.47	0.313	0.021	0.3105	0.0248	0.0000	3.36E-08
135	0.67	0.466	0.087	0.3220	0.0248	0.0000	3.36E-08
136	0.84	0.564	0.286	0.3207	0.0248	0.0000	3.36E-08
137	0.00	0.000	0.108	0.3099	0.0247	0.0000	3.35E-08
138	0.00	0.000	0.086	0.3013	0.0247	0.0000	3.35E-08
139	0.00	0.000	0.205	0.2808	0.0247	0.0000	3.35E-08
140	0.00	0.000	0.033	0.2775	0.0248	0.0000	3.36E-08
141	0.00	0.000	0.004	0.2771	0.0249	0.0000	3.37E-08
142	0.38	0.195	0.050	0.2908	0.0249	0.0000	3.37E-08
143	0.00	0.000	0.069	0.2839	0.0249	0.0000	3.37E-08
144	0.00	0.000	0.025	0.2814	0.0249	0.0000	3.37E-08
145	0.00	0.000	0.022	0.2792	0.0249	0.0000	3.37E-08
146	0.00	0.000	0.019	0.2773	0.0249	0.0000	3.37E-08
147	0.00	0.000	0.001	0.2771	0.0249	0.0000	3.37E-08
148	0.33	0.160	0.032	0.2904	0.0249	0.0000	3.37E-08
149	0.00	0.000	0.060	0.2844	0.0248	0.0000	3.36E-08
150	0.00	0.000	0.017	0.2827	0.0248	0.0000	3.36E-08
151	0.03	0.000	0.024	0.2834	0.0248	0.0000	3.36E-08
152	0.20	0.063	0.025	0.2951	0.0248	0.0000	3.36E-08

153	0.04	0.000	0.135	0.2854	0.0248	0.0000	3.36E-08
154	0.00	0.000	0.018	0.2836	0.0248	0.0000	3.36E-08
155	0.00	0.000	0.017	0.2819	0.0248	0.0000	3.36E-08
156	0.00	0.000	0.018	0.2801	0.0248	0.0000	3.36E-08
157	0.00	0.000	0.018	0.2783	0.0248	0.0000	3.36E-08
158	0.00	0.000	0.006	0.2776	0.0248	0.0000	3.36E-08
159	0.00	0.000	0.004	0.2772	0.0249	0.0000	3.37E-08
160	0.00	0.000	0.001	0.2771	0.0250	0.0000	3.37E-08
161	0.00	0.000	0.000	0.2770	0.0249	0.0000	3.37E-08
162	0.54	0.350	0.025	0.2930	0.0249	0.0000	3.37E-08
163	0.00	0.000	0.115	0.2815	0.0249	0.0000	3.37E-08
164	0.00	0.000	0.013	0.2802	0.0249	0.0000	3.37E-08
165	1.29	1.106	0.028	0.2958	0.0249	0.0000	3.37E-08
166	0.00	0.000	0.139	0.2819	0.0249	0.0000	3.37E-08
167	0.00	0.000	0.017	0.2802	0.0249	0.0000	3.37E-08
168	0.00	0.000	0.012	0.2789	0.0249	0.0000	3.37E-08
169	0.06	0.000	0.019	0.2830	0.0249	0.0000	3.37E-08
170	0.90	0.744	0.027	0.2961	0.0249	0.0000	3.37E-08
171	0.00	0.000	0.075	0.2885	0.0249	0.0000	3.37E-08
172	0.00	0.000	0.083	0.2802	0.0250	0.0000	3.38E-08
173	0.00	0.000	0.023	0.2779	0.0254	0.0000	3.42E-08
174	0.00	0.000	0.010	0.2772	0.0254	0.0000	3.42E-08
175	0.39	0.189	0.064	0.2906	0.0254	0.0000	3.41E-08
176	0.00	0.000	0.020	0.2886	0.0254	0.0000	3.41E-08
177	0.00	0.000	0.028	0.2858	0.0253	0.0000	3.41E-08
178	0.76	0.576	0.040	0.3005	0.0253	0.0000	3.41E-08
179	0.02	0.000	0.116	0.2911	0.0253	0.0000	3.41E-08
180	0.00	0.000	0.120	0.2791	0.0253	0.0000	3.41E-08
181	0.05	0.000	0.035	0.2806	0.0253	0.0000	3.41E-08
182	0.04	0.000	0.014	0.2829	0.0253	0.0000	3.41E-08
183	0.06	0.000	0.027	0.2862	0.0253	0.0000	3.41E-08
184	0.00	0.000	0.022	0.2840	0.0255	0.0000	3.43E-08

185	1.74	1.553	0.044	0.2981	0.0255	0.0000	3.43E-08
186	0.66	0.308	0.376	0.2956	0.0255	0.0000	3.43E-08
187	0.15	0.001	0.194	0.2911	0.0255	0.0000	3.43E-08
188	0.01	0.000	0.122	0.2795	0.0255	0.0000	3.43E-08
189	0.69	0.398	0.147	0.2936	0.0255	0.0000	3.43E-08
190	0.00	0.000	0.122	0.2814	0.0255	0.0000	3.43E-08
191	0.00	0.000	0.024	0.2790	0.0256	0.0000	3.44E-08
192	0.00	0.000	0.011	0.2779	0.0257	0.0000	3.45E-08
193	0.24	0.095	0.033	0.2891	0.0257	0.0000	3.45E-08
194	0.00	0.000	0.018	0.2873	0.0257	0.0000	3.45E-08
195	0.00	0.000	0.026	0.2847	0.0257	0.0000	3.45E-08
196	0.00	0.000	0.025	0.2822	0.0257	0.0000	3.45E-08
197	0.00	0.000	0.027	0.2795	0.0257	0.0000	3.45E-08
198	0.00	0.000	0.020	0.2775	0.0257	0.0000	3.45E-08
199	0.00	0.000	0.003	0.2773	0.0257	0.0000	3.45E-08
200	0.00	0.000	0.001	0.2771	0.0257	0.0000	3.44E-08
201	0.00	0.000	0.001	0.2770	0.0257	0.0000	3.44E-08
202	0.00	0.000	0.000	0.2770	0.0257	0.0000	3.45E-08
203	0.00	0.000	0.000	0.2770	0.0259	0.0000	3.47E-08
204	0.00	0.000	0.000	0.2770	0.0259	0.0000	3.47E-08
205	0.00	0.000	0.000	0.2770	0.0259	0.0000	3.47E-08
206	0.00	0.000	0.000	0.2770	0.0259	0.0000	3.46E-08
207	0.00	0.000	0.000	0.2770	0.0259	0.0000	3.46E-08
208	0.26	0.119	0.018	0.2895	0.0259	0.0000	3.46E-08
209	0.98	0.837	0.026	0.3008	0.0259	0.0000	3.46E-08
210	0.00	0.000	0.105	0.2903	0.0258	0.0000	3.46E-08
211	0.00	0.000	0.018	0.2885	0.0258	0.0000	3.46E-08
212	0.50	0.324	0.030	0.3030	0.0258	0.0000	3.46E-08
213	0.20	0.068	0.088	0.3076	0.0258	0.0000	3.46E-08
214	0.00	0.000	0.090	0.2986	0.0258	0.0000	3.46E-08
215	0.00	0.000	0.188	0.2797	0.0258	0.0000	3.46E-08
216	0.00	0.000	0.020	0.2777	0.0258	0.0000	3.46E-08

217	0.03	0.000	0.023	0.2781	0.0260	0.0000	3.47E-08
218	0.17	0.033	0.039	0.2880	0.0261	0.0000	3.49E-08
219	0.00	0.000	0.025	0.2856	0.0261	0.0000	3.49E-08
220	0.00	0.000	0.032	0.2824	0.0261	0.0000	3.49E-08
221	0.00	0.000	0.032	0.2791	0.0261	0.0000	3.49E-08
222	0.12	0.000	0.027	0.2887	0.0261	0.0000	3.49E-08
223	0.01	0.000	0.022	0.2871	0.0261	0.0000	3.48E-08
224	0.00	0.000	0.021	0.2850	0.0261	0.0000	3.48E-08
225	0.00	0.000	0.021	0.2830	0.0261	0.0000	3.48E-08
226	0.00	0.000	0.020	0.2810	0.0261	0.0000	3.48E-08
227	0.00	0.000	0.021	0.2789	0.0261	0.0000	3.48E-08
228	0.00	0.000	0.015	0.2774	0.0260	0.0000	3.48E-08
229	0.00	0.000	0.003	0.2771	0.0260	0.0000	3.48E-08
230	0.00	0.000	0.001	0.2770	0.0260	0.0000	3.48E-08
231	0.00	0.000	0.000	0.2770	0.0260	0.0000	3.48E-08
232	0.00	0.000	0.000	0.2770	0.0260	0.0000	3.48E-08
233	0.00	0.000	0.000	0.2770	0.0260	0.0000	3.48E-08
234	0.00	0.000	0.000	0.2770	0.0260	0.0000	3.48E-08
235	0.00	0.000	0.000	0.2770	0.0260	0.0000	3.48E-08
236	0.07	0.000	0.012	0.2831	0.0260	0.0000	3.48E-08
237	0.00	0.000	0.016	0.2814	0.0260	0.0000	3.47E-08
238	0.00	0.000	0.024	0.2790	0.0260	0.0000	3.47E-08
239	0.00	0.000	0.008	0.2782	0.0260	0.0000	3.47E-08
240	0.00	0.000	0.006	0.2776	0.0260	0.0000	3.47E-08
241	0.00	0.000	0.004	0.2772	0.0259	0.0000	3.47E-08
242	0.00	0.000	0.002	0.2770	0.0259	0.0000	3.47E-08
243	0.00	0.000	0.000	0.2770	0.0259	0.0000	3.47E-08
244	0.23	0.082	0.018	0.2897	0.0259	0.0000	3.47E-08
245	0.00	0.000	0.015	0.2881	0.0259	0.0000	3.47E-08
246	0.00	0.000	0.023	0.2858	0.0259	0.0000	3.47E-08
247	0.00	0.000	0.022	0.2836	0.0259	0.0000	3.47E-08
248	0.00	0.000	0.018	0.2818	0.0259	0.0000	3.47E-08

249	0.07	0.000	0.031	0.2861	0.0259	0.0000	3.47E-08
250	0.14	0.007	0.030	0.2961	0.0259	0.0000	3.47E-08
251	0.44	0.299	0.026	0.3072	0.0259	0.0000	3.46E-08
252	1.50	1.127	0.276	0.3170	0.0259	0.0000	3.46E-08
253	0.99	0.712	0.172	0.3279	0.0259	0.0000	3.47E-08
254	0.00	0.000	0.214	0.3065	0.0259	0.0000	3.47E-08
255	0.35	0.116	0.418	0.2881	0.0259	0.0000	3.47E-08
256	0.51	0.264	0.128	0.2997	0.0259	0.0000	3.47E-08
257	0.00	0.000	0.108	0.2890	0.0259	0.0000	3.47E-08
258	0.00	0.000	0.069	0.2820	0.0259	0.0000	3.47E-08
259	0.00	0.000	0.039	0.2781	0.0259	0.0000	3.47E-08
260	0.00	0.000	0.005	0.2775	0.0259	0.0000	3.47E-08
261	1.04	0.810	0.075	0.2928	0.0259	0.0000	3.47E-08
262	0.69	0.310	0.302	0.3006	0.0259	0.0000	3.47E-08
263	0.00	0.000	0.085	0.2921	0.0259	0.0000	3.46E-08
264	0.00	0.000	0.121	0.2800	0.0259	0.0000	3.46E-08
265	0.00	0.000	0.025	0.2775	0.0259	0.0000	3.46E-08
266	0.00	0.000	0.004	0.2772	0.0259	0.0000	3.46E-08
267	1.21	0.996	0.055	0.2931	0.0258	0.0000	3.46E-08
268	0.24	0.079	0.113	0.2984	0.0258	0.0000	3.46E-08
269	0.00	0.000	0.082	0.2905	0.0258	0.0000	3.46E-08
270	0.00	0.000	0.111	0.2793	0.0258	0.0000	3.46E-08
271	0.00	0.000	0.015	0.2779	0.0258	0.0000	3.46E-08
272	0.00	0.000	0.004	0.2774	0.0258	0.0000	3.46E-08
273	0.17	0.022	0.032	0.2889	0.0258	0.0000	3.46E-08
274	0.03	0.000	0.030	0.2891	0.0258	0.0000	3.46E-08
275	0.87	0.701	0.047	0.3012	0.0258	0.0000	3.46E-08
276	0.15	0.011	0.096	0.3057	0.0258	0.0000	3.46E-08
277	0.00	0.000	0.109	0.2948	0.0258	0.0000	3.45E-08
278	1.42	1.062	0.226	0.3082	0.0258	0.0000	3.45E-08
279	0.00	0.000	0.136	0.2946	0.0258	0.0000	3.45E-08
280	0.00	0.000	0.099	0.2847	0.0257	0.0000	3.45E-08

281		0.00	0.000	0.048	0.2799	0.0257	0.0000	3.45E-08
282		0.00	0.000	0.017	0.2782	0.0257	0.0000	3.45E-08
283		0.00	0.000	0.007	0.2775	0.0257	0.0000	3.45E-08
284		0.00	0.000	0.004	0.2771	0.0257	0.0000	3.45E-08
285		0.15	0.002	0.028	0.2890	0.0257	0.0000	3.45E-08
286		0.00	0.000	0.017	0.2873	0.0257	0.0000	3.45E-08
287		0.00	0.000	0.022	0.2851	0.0257	0.0000	3.45E-08
288		0.00	0.000	0.021	0.2830	0.0257	0.0000	3.45E-08
289		0.00	0.000	0.020	0.2810	0.0257	0.0000	3.45E-08
290		1.26	1.072	0.035	0.2965	0.0257	0.0000	3.45E-08
291		0.20	0.065	0.078	0.3025	0.0257	0.0000	3.44E-08
292		0.00	0.000	0.075	0.2950	0.0257	0.0000	3.44E-08
293		0.00	0.000	0.131	0.2819	0.0257	0.0000	3.44E-08
294		0.00	0.000	0.037	0.2782	0.0256	0.0000	3.44E-08
295		0.00	0.000	0.009	0.2773	0.0256	0.0000	3.44E-08
296		0.00	0.000	0.002	0.2771	0.0256	0.0000	3.44E-08
297	*	0.00	0.000	0.001	0.2770	0.0256	0.0000	3.44E-08
298		0.00	0.000	0.000	0.2770	0.0256	0.0000	3.44E-08
299	*	0.00	0.000	0.000	0.2770	0.0256	0.0000	3.44E-08
300	*	0.00	0.000	0.000	0.2770	0.0256	0.0000	3.44E-08
301	*	0.14	0.000	0.022	0.2790	0.0256	0.0000	3.44E-08
302	*	0.04	0.000	0.000	0.2809	0.0256	0.0000	3.44E-08
303		0.90	0.885	0.000	0.2936	0.0256	0.0000	3.44E-08
304		0.79	0.597	0.076	0.3052	0.0256	0.0000	3.44E-08
305		0.01	0.000	0.046	0.3019	0.0256	0.0000	3.43E-08
306		0.10	0.000	0.063	0.3059	0.0256	0.0000	3.43E-08
307		0.00	0.000	0.100	0.2960	0.0256	0.0000	3.43E-08
308		0.00	0.000	0.125	0.2834	0.0255	0.0000	3.43E-08
309		0.00	0.000	0.039	0.2795	0.0255	0.0000	3.43E-08
310		0.00	0.000	0.016	0.2779	0.0255	0.0000	3.43E-08
311		0.00	0.000	0.006	0.2773	0.0255	0.0000	3.43E-08
312		0.00	0.000	0.003	0.2770	0.0255	0.0000	3.43E-08

313		0.00	0.000	0.000	0.2770	0.0255	0.0000	3.43E-08
314		0.00	0.000	0.000	0.2770	0.0255	0.0000	3.43E-08
315		0.24	0.096	0.024	0.2893	0.0255	0.0000	3.43E-08
316		0.05	0.000	0.022	0.2921	0.0255	0.0000	3.43E-08
317		1.01	0.847	0.036	0.3045	0.0255	0.0000	3.43E-08
318		0.00	0.000	0.080	0.2966	0.0255	0.0000	3.43E-08
319		0.10	0.000	0.091	0.2971	0.0255	0.0000	3.43E-08
320		0.53	0.323	0.071	0.3104	0.0255	0.0000	3.42E-08
321		0.00	0.000	0.086	0.3018	0.0255	0.0000	3.42E-08
322		0.00	0.000	0.056	0.2962	0.0254	0.0000	3.42E-08
323		0.00	0.000	0.072	0.2890	0.0254	0.0000	3.42E-08
324		0.00	0.000	0.056	0.2834	0.0254	0.0000	3.42E-08
325		0.00	0.000	0.047	0.2787	0.0254	0.0000	3.42E-08
326		0.00	0.000	0.014	0.2774	0.0254	0.0000	3.42E-08
327		0.00	0.000	0.002	0.2772	0.0254	0.0000	3.42E-08
328		0.00	0.000	0.002	0.2770	0.0254	0.0000	3.42E-08
329		0.00	0.000	0.000	0.2770	0.0254	0.0000	3.42E-08
330		0.00	0.000	0.000	0.2770	0.0254	0.0000	3.42E-08
331		0.80	0.594	0.039	0.2933	0.0254	0.0000	3.42E-08
332		0.00	0.000	0.067	0.2866	0.0254	0.0000	3.42E-08
333		0.00	0.000	0.019	0.2847	0.0254	0.0000	3.42E-08
334		0.00	0.000	0.017	0.2830	0.0254	0.0000	3.42E-08
335		0.00	0.000	0.016	0.2814	0.0254	0.0000	3.41E-08
336		0.00	0.000	0.015	0.2799	0.0254	0.0000	3.41E-08
337		0.00	0.000	0.014	0.2785	0.0253	0.0000	3.41E-08
338		0.00	0.000	0.008	0.2777	0.0253	0.0000	3.41E-08
339		0.00	0.000	0.004	0.2773	0.0253	0.0000	3.41E-08
340	*	0.20	0.000	0.036	0.2793	0.0253	0.0000	3.41E-08
341		0.00	0.000	0.053	0.2882	0.0253	0.0000	3.41E-08
342		0.00	0.000	0.010	0.2872	0.0253	0.0000	3.41E-08
343		0.00	0.000	0.009	0.2863	0.0254	0.0000	3.42E-08
344		0.01	0.000	0.015	0.2854	0.0258	0.0000	3.46E-08

345		0.01	0.000	0.017	0.2847	0.0258	0.0000	3.46E-08
346		0.16	0.017	0.019	0.2967	0.0258	0.0000	3.46E-08
347		0.00	0.000	0.009	0.2958	0.0258	0.0000	3.45E-08
348		0.00	0.000	0.011	0.2948	0.0258	0.0000	3.45E-08
349		0.00	0.000	0.010	0.2938	0.0258	0.0000	3.45E-08
350		0.00	0.000	0.010	0.2928	0.0257	0.0000	3.45E-08
351		0.00	0.000	0.009	0.2919	0.0257	0.0000	3.45E-08
352	*	0.49	0.000	0.023	0.2939	0.0257	0.0000	3.45E-08
353		0.88	1.195	0.000	0.3066	0.0257	0.0000	3.45E-08
354	*	0.00	0.000	0.000	0.3066	0.0257	0.0000	3.45E-08
355	*	0.00	0.000	0.000	0.3066	0.0257	0.0000	3.45E-08
356	*	0.01	0.000	0.028	0.3043	0.0257	0.0000	3.45E-08
357		0.00	0.000	0.038	0.3005	0.0257	0.0000	3.45E-08
358		0.00	0.000	0.078	0.2927	0.0257	0.0000	3.45E-08
359		0.00	0.000	0.072	0.2855	0.0257	0.0000	3.45E-08
360	*	0.21	0.000	0.040	0.2875	0.0257	0.0000	3.45E-08
361		0.00	0.000	0.077	0.2947	0.0257	0.0000	3.44E-08
362	*	0.00	0.000	0.039	0.2908	0.0257	0.0000	3.44E-08
363		0.66	0.420	0.093	0.3051	0.0257	0.0000	3.44E-08
364		0.00	0.000	0.059	0.2992	0.0257	0.0000	3.44E-08
365		0.00	0.000	0.081	0.2910	0.0256	0.0000	3.44E-08

* = Frozen (air or soil)

Annual Totals for Year 1			
	inches	cubic feet	percent
Precipitation	43.62	158,339.0	100.00
Runoff	27.989	101,600.1	64.17
Evapotranspiration	15.613	56,676.7	35.79
Recirculation into Layer 1	0.0010	3.7404	0.00
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0010	3.7404	0.00
Percolation/Leakage through Layer 5	0.000012	0.0446	0.00
Average Head on Top of Layer 4	0.0249	---	---
Change in Water Storage	0.0171	62.1	0.04
Soil Water at Start of Year	1,406.5955	5,105,941.5	3224.69
Soil Water at End of Year	1,406.6126	5,106,003.6	3224.73
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0010	-3.7395	0.00

Daily Output for Year 2

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.034	0.2876	0.0262	0.0000	3.49E-08
2			0.15	0.009	0.071	0.2944	0.0264	0.0000	3.52E-08
3			0.03	0.000	0.068	0.2907	0.0264	0.0000	3.52E-08
4	*		0.03	0.000	0.048	0.2889	0.0264	0.0000	3.52E-08
5			0.00	0.000	0.058	0.2831	0.0264	0.0000	3.52E-08
6			0.00	0.000	0.048	0.2783	0.0265	0.0000	3.52E-08
7			0.00	0.000	0.010	0.2773	0.0267	0.0000	3.54E-08
8			0.02	0.000	0.014	0.2777	0.0267	0.0000	3.54E-08
9	*		0.20	0.000	0.052	0.2797	0.0267	0.0000	3.54E-08
10			0.07	0.026	0.044	0.2932	0.0267	0.0000	3.54E-08
11	*		0.00	0.000	0.000	0.2932	0.0267	0.0000	3.54E-08
12			0.00	0.000	0.025	0.2907	0.0267	0.0000	3.54E-08
13			0.00	0.000	0.053	0.2854	0.0267	0.0000	3.54E-08
14			0.00	0.000	0.058	0.2796	0.0268	0.0000	3.55E-08
15			0.19	0.047	0.050	0.2891	0.0268	0.0000	3.55E-08
16			0.00	0.000	0.022	0.2869	0.0267	0.0000	3.55E-08
17	*		0.00	0.000	0.024	0.2845	0.0267	0.0000	3.55E-08
18			0.00	0.000	0.021	0.2825	0.0267	0.0000	3.55E-08
19	*		0.00	0.000	0.019	0.2806	0.0267	0.0000	3.55E-08
20			0.00	0.000	0.017	0.2789	0.0267	0.0000	3.55E-08
21			0.00	0.000	0.014	0.2775	0.0267	0.0000	3.55E-08
22			0.00	0.000	0.003	0.2773	0.0267	0.0000	3.54E-08
23			0.00	0.000	0.001	0.2771	0.0267	0.0000	3.54E-08
24	*		0.00	0.000	0.001	0.2770	0.0267	0.0000	3.54E-08

25			0.00	0.000	0.000	0.2770	0.0267	0.0000	3.54E-08
26	*		0.00	0.000	0.000	0.2770	0.0267	0.0000	3.54E-08
27	*		0.00	0.000	0.000	0.2770	0.0267	0.0000	3.54E-08
28	*		0.00	0.000	0.000	0.2770	0.0267	0.0000	3.54E-08
29	*		0.00	0.000	0.000	0.2770	0.0267	0.0000	3.54E-08
30			0.00	0.000	0.000	0.2770	0.0266	0.0000	3.54E-08
31	*		0.00	0.000	0.000	0.2770	0.0266	0.0000	3.54E-08
32	*		0.00	0.000	0.000	0.2770	0.0266	0.0000	3.54E-08
33	*		0.00	0.000	0.000	0.2770	0.0266	0.0000	3.54E-08
34			0.00	0.000	0.000	0.2770	0.0266	0.0000	3.54E-08
35	*		0.08	0.000	0.029	0.2790	0.0266	0.0000	3.54E-08
36	*		0.00	0.000	0.027	0.2790	0.0266	0.0000	3.53E-08
37	*		0.00	0.000	0.000	0.2790	0.0266	0.0000	3.53E-08
38	*		0.00	0.000	0.000	0.2790	0.0266	0.0000	3.53E-08
39	*	*	0.00	0.000	0.000	0.2790	0.0266	0.0000	3.53E-08
40	*	*	0.04	0.000	0.042	0.2790	0.0266	0.0000	3.53E-08
41		*	0.00	0.000	0.000	0.2790	0.0266	0.0000	3.53E-08
42		*	0.00	0.000	0.000	0.2790	0.0266	0.0000	3.53E-08
43			0.00	0.000	0.003	0.2787	0.0265	0.0000	3.53E-08
44			0.00	0.000	0.003	0.2784	0.0265	0.0000	3.53E-08
45	*		0.00	0.000	0.003	0.2781	0.0265	0.0000	3.53E-08
46	*	*	0.00	0.000	0.000	0.2781	0.0265	0.0000	3.53E-08
47	*	*	0.00	0.000	0.000	0.2781	0.0265	0.0000	3.53E-08
48	*	*	0.00	0.000	0.000	0.2781	0.0265	0.0000	3.53E-08
49	*	*	0.00	0.000	0.000	0.2781	0.0265	0.0000	3.52E-08
50		*	0.00	0.000	0.000	0.2781	0.0265	0.0000	3.52E-08
51		*	0.00	0.000	0.000	0.2781	0.0265	0.0000	3.52E-08
52			0.00	0.000	0.003	0.2779	0.0265	0.0000	3.52E-08
53			0.00	0.000	0.002	0.2776	0.0265	0.0000	3.52E-08
54			0.00	0.000	0.002	0.2774	0.0265	0.0000	3.52E-08
55			0.00	0.000	0.002	0.2772	0.0265	0.0000	3.52E-08
56			0.00	0.000	0.001	0.2770	0.0264	0.0000	3.52E-08

57		0.00	0.000	0.000	0.2770	0.0264	0.0000	3.52E-08
58		0.00	0.000	0.000	0.2770	0.0264	0.0000	3.52E-08
59		0.00	0.000	0.000	0.2770	0.0264	0.0000	3.52E-08
60	*	0.39	0.000	0.027	0.2790	0.0264	0.0000	3.52E-08
61	*	0.09	0.000	0.032	0.2809	0.0264	0.0000	3.52E-08
62		0.00	0.196	0.060	0.2936	0.0264	0.0000	3.52E-08
63		0.00	0.000	0.005	0.2931	0.0264	0.0000	3.52E-08
64		0.00	0.000	0.008	0.2923	0.0264	0.0000	3.51E-08
65		0.00	0.000	0.008	0.2915	0.0264	0.0000	3.51E-08
66		0.05	0.000	0.016	0.2946	0.0264	0.0000	3.51E-08
67		0.00	0.000	0.009	0.2938	0.0264	0.0000	3.51E-08
68		0.00	0.000	0.009	0.2929	0.0264	0.0000	3.51E-08
69		0.00	0.000	0.008	0.2921	0.0264	0.0000	3.51E-08
70		0.00	0.000	0.007	0.2914	0.0264	0.0000	3.51E-08
71	*	0.00	0.000	0.007	0.2906	0.0264	0.0000	3.51E-08
72		0.00	0.000	0.007	0.2899	0.0264	0.0000	3.51E-08
73		0.25	0.090	0.019	0.3037	0.0264	0.0000	3.51E-08
74	*	0.21	0.000	0.034	0.3057	0.0264	0.0000	3.51E-08
75	*	0.00	0.000	0.043	0.3076	0.0264	0.0000	3.51E-08
76	*	0.00	0.000	0.049	0.3096	0.0263	0.0000	3.51E-08
77		0.00	0.000	0.101	0.3021	0.0263	0.0000	3.51E-08
78	*	0.00	0.000	0.000	0.3021	0.0263	0.0000	3.51E-08
79	*	0.00	0.000	0.000	0.3021	0.0263	0.0000	3.51E-08
80		0.00	0.000	0.008	0.3013	0.0263	0.0000	3.51E-08
81	*	0.00	0.000	0.000	0.3013	0.0263	0.0000	3.51E-08
82	*	0.00	0.000	0.000	0.3013	0.0263	0.0000	3.51E-08
83		0.00	0.000	0.007	0.3005	0.0263	0.0000	3.51E-08
84		0.00	0.000	0.008	0.2997	0.0263	0.0000	3.50E-08
85		0.00	0.000	0.008	0.2989	0.0263	0.0000	3.50E-08
86		2.68	2.514	0.018	0.3134	0.0263	0.0000	3.50E-08
87		0.50	0.247	0.153	0.3233	0.0263	0.0000	3.50E-08
88		0.00	0.000	0.106	0.3127	0.0263	0.0000	3.50E-08

89		0.00	0.000	0.092	0.3035	0.0262	0.0000	3.50E-08
90		0.00	0.000	0.126	0.2909	0.0262	0.0000	3.50E-08
91	*	0.66	0.000	0.041	0.2928	0.0262	0.0000	3.50E-08
92		3.27	3.730	0.000	0.3071	0.0262	0.0000	3.50E-08
93		0.55	0.311	0.127	0.3187	0.0262	0.0000	3.50E-08
94		0.35	0.161	0.162	0.3217	0.0262	0.0000	3.50E-08
95		0.00	0.000	0.100	0.3117	0.0262	0.0000	3.50E-08
96		0.00	0.000	0.085	0.3031	0.0262	0.0000	3.50E-08
97		0.00	0.000	0.105	0.2927	0.0262	0.0000	3.49E-08
98		0.37	0.142	0.126	0.3025	0.0262	0.0000	3.49E-08
99		0.61	0.379	0.111	0.3142	0.0262	0.0000	3.49E-08
100		0.02	0.000	0.115	0.3044	0.0262	0.0000	3.49E-08
101		0.00	0.000	0.132	0.2912	0.0262	0.0000	3.49E-08
102		0.00	0.000	0.099	0.2813	0.0261	0.0000	3.49E-08
103	*	0.00	0.000	0.000	0.2813	0.0261	0.0000	3.49E-08
104	*	0.00	0.000	0.000	0.2813	0.0261	0.0000	3.49E-08
105	*	0.13	0.000	0.042	0.2833	0.0261	0.0000	3.49E-08
106	*	0.00	0.000	0.053	0.2849	0.0261	0.0000	3.49E-08
107	*	0.00	0.000	0.000	0.2849	0.0261	0.0000	3.49E-08
108	*	0.00	0.000	0.043	0.2805	0.0261	0.0000	3.49E-08
109	*	0.11	0.000	0.055	0.2825	0.0261	0.0000	3.49E-08
110	*	0.00	0.000	0.032	0.2825	0.0261	0.0000	3.49E-08
111		0.02	0.000	0.041	0.2808	0.0261	0.0000	3.48E-08
112		0.02	0.000	0.017	0.2809	0.0262	0.0000	3.49E-08
113		0.00	0.000	0.019	0.2790	0.0262	0.0000	3.50E-08
114		0.00	0.000	0.015	0.2775	0.0263	0.0000	3.50E-08
115		0.00	0.000	0.002	0.2772	0.0263	0.0000	3.50E-08
116		0.00	0.000	0.001	0.2771	0.0263	0.0000	3.50E-08
117		0.83	0.624	0.043	0.2934	0.0262	0.0000	3.50E-08
118		0.00	0.000	0.107	0.2827	0.0262	0.0000	3.50E-08
119		0.00	0.000	0.021	0.2806	0.0262	0.0000	3.50E-08
120		0.00	0.000	0.023	0.2783	0.0262	0.0000	3.50E-08

121		0.00	0.000	0.015	0.2772	0.0262	0.0000	3.50E-08
122		0.06	0.000	0.012	0.2822	0.0262	0.0000	3.50E-08
123		0.09	0.000	0.019	0.2898	0.0262	0.0000	3.50E-08
124		0.03	0.000	0.017	0.2912	0.0262	0.0000	3.50E-08
125		0.06	0.000	0.019	0.2953	0.0262	0.0000	3.49E-08
126	*	0.00	0.000	0.013	0.2940	0.0262	0.0000	3.49E-08
127		0.17	0.027	0.022	0.3063	0.0262	0.0000	3.49E-08
128		0.00	0.000	0.014	0.3049	0.0262	0.0000	3.49E-08
129		0.00	0.000	0.012	0.3037	0.0262	0.0000	3.49E-08
130		0.00	0.000	0.012	0.3025	0.0262	0.0000	3.50E-08
131		0.22	0.070	0.020	0.3151	0.0262	0.0000	3.50E-08
132		0.79	0.582	0.097	0.3267	0.0262	0.0000	3.50E-08
133		0.46	0.278	0.162	0.3287	0.0262	0.0000	3.49E-08
134	*	0.31	0.000	0.049	0.3307	0.0262	0.0000	3.49E-08
135		1.27	1.392	0.000	0.3434	0.0262	0.0000	3.49E-08
136		0.00	0.000	0.065	0.3369	0.0262	0.0000	3.49E-08
137		0.00	0.000	0.126	0.3246	0.0262	0.0000	3.49E-08
138		0.21	0.064	0.070	0.3321	0.0262	0.0000	3.49E-08
139		0.00	0.000	0.152	0.3169	0.0262	0.0000	3.49E-08
140		0.00	0.000	0.169	0.3001	0.0262	0.0000	3.49E-08
141		0.00	0.000	0.194	0.2806	0.0262	0.0000	3.49E-08
142		0.00	0.000	0.023	0.2784	0.0261	0.0000	3.49E-08
143		0.00	0.000	0.011	0.2772	0.0261	0.0000	3.49E-08
144		0.00	0.000	0.002	0.2770	0.0265	0.0000	3.53E-08
145		0.07	0.000	0.012	0.2833	0.0277	0.0000	3.64E-08
146		0.17	0.028	0.022	0.2954	0.0277	0.0000	3.64E-08
147		0.52	0.365	0.038	0.3069	0.0277	0.0000	3.64E-08
148		0.00	0.000	0.100	0.2969	0.0276	0.0000	3.64E-08
149		0.02	0.000	0.026	0.2965	0.0276	0.0000	3.63E-08
150		0.34	0.179	0.033	0.3095	0.0276	0.0000	3.63E-08
151		0.00	0.000	0.183	0.2912	0.0276	0.0000	3.63E-08
152		0.00	0.000	0.019	0.2892	0.0276	0.0000	3.63E-08

153	0.00	0.000	0.022	0.2871	0.0276	0.0000	3.63E-08
154	0.00	0.000	0.020	0.2851	0.0276	0.0000	3.63E-08
155	0.00	0.000	0.017	0.2833	0.0276	0.0000	3.63E-08
156	0.00	0.000	0.014	0.2819	0.0279	0.0000	3.66E-08
157	0.00	0.000	0.018	0.2801	0.0280	0.0000	3.67E-08
158	0.00	0.000	0.012	0.2792	0.0280	0.0000	3.67E-08
159	2.14	1.948	0.029	0.2951	0.0280	0.0000	3.67E-08
160	0.00	0.000	0.104	0.2847	0.0280	0.0000	3.67E-08
161	0.01	0.000	0.068	0.2794	0.0280	0.0000	3.67E-08
162	0.00	0.000	0.012	0.2781	0.0280	0.0000	3.66E-08
163	0.00	0.000	0.006	0.2776	0.0279	0.0000	3.66E-08
164	0.00	0.000	0.004	0.2771	0.0279	0.0000	3.66E-08
165	0.00	0.000	0.001	0.2770	0.0279	0.0000	3.66E-08
166	0.00	0.000	0.000	0.2770	0.0279	0.0000	3.66E-08
167	0.09	0.000	0.011	0.2848	0.0279	0.0000	3.66E-08
168	0.00	0.000	0.012	0.2836	0.0279	0.0000	3.66E-08
169	0.00	0.000	0.014	0.2821	0.0279	0.0000	3.66E-08
170	0.00	0.000	0.017	0.2804	0.0279	0.0000	3.66E-08
171	0.00	0.000	0.017	0.2788	0.0279	0.0000	3.66E-08
172	0.49	0.304	0.032	0.2939	0.0279	0.0000	3.66E-08
173	0.23	0.057	0.188	0.2920	0.0279	0.0000	3.66E-08
174	0.01	0.000	0.022	0.2913	0.0279	0.0000	3.66E-08
175	0.00	0.000	0.016	0.2897	0.0278	0.0000	3.66E-08
176	0.00	0.000	0.015	0.2882	0.0279	0.0000	3.66E-08
177	0.00	0.000	0.015	0.2867	0.0279	0.0000	3.66E-08
178	0.00	0.000	0.016	0.2851	0.0278	0.0000	3.66E-08
179	0.00	0.000	0.014	0.2837	0.0278	0.0000	3.65E-08
180	0.00	0.000	0.012	0.2825	0.0278	0.0000	3.65E-08
181	0.06	0.000	0.021	0.2861	0.0278	0.0000	3.65E-08
182	0.39	0.226	0.026	0.2999	0.0278	0.0000	3.65E-08
183	0.00	0.000	0.071	0.2928	0.0278	0.0000	3.65E-08
184	0.00	0.000	0.013	0.2914	0.0278	0.0000	3.65E-08

185	0.00	0.000	0.012	0.2902	0.0278	0.0000	3.65E-08
186	0.62	0.449	0.027	0.3044	0.0278	0.0000	3.65E-08
187	0.00	0.000	0.142	0.2902	0.0279	0.0000	3.66E-08
188	0.00	0.000	0.100	0.2806	0.0278	0.0000	3.65E-08
189	0.00	0.000	0.019	0.2788	0.0278	0.0000	3.65E-08
190	0.00	0.000	0.009	0.2779	0.0278	0.0000	3.65E-08
191	0.00	0.000	0.007	0.2772	0.0278	0.0000	3.65E-08
192	0.00	0.000	0.002	0.2770	0.0278	0.0000	3.65E-08
193	0.00	0.000	0.000	0.2770	0.0278	0.0000	3.65E-08
194	0.00	0.000	0.000	0.2770	0.0278	0.0000	3.65E-08
195	0.00	0.000	0.000	0.2770	0.0278	0.0000	3.65E-08
196	0.00	0.000	0.000	0.2770	0.0278	0.0000	3.65E-08
197	0.01	0.000	0.005	0.2770	0.0278	0.0000	3.65E-08
198	0.18	0.031	0.019	0.2896	0.0278	0.0000	3.65E-08
199	0.40	0.254	0.030	0.3011	0.0278	0.0000	3.65E-08
200	0.26	0.112	0.029	0.3126	0.0278	0.0000	3.65E-08
201	0.59	0.441	0.030	0.3241	0.0278	0.0000	3.65E-08
202	0.00	0.000	0.250	0.2991	0.0278	0.0000	3.65E-08
203	0.00	0.000	0.019	0.2972	0.0278	0.0000	3.65E-08
204	0.00	0.000	0.020	0.2951	0.0277	0.0000	3.64E-08
205	0.00	0.000	0.021	0.2930	0.0277	0.0000	3.64E-08
206	0.00	0.000	0.022	0.2908	0.0277	0.0000	3.64E-08
207	0.00	0.000	0.022	0.2887	0.0277	0.0000	3.64E-08
208	0.01	0.000	0.022	0.2871	0.0277	0.0000	3.64E-08
209	0.00	0.000	0.019	0.2851	0.0277	0.0000	3.64E-08
210	0.00	0.000	0.019	0.2832	0.0277	0.0000	3.64E-08
211	0.00	0.000	0.018	0.2814	0.0277	0.0000	3.64E-08
212	0.00	0.000	0.021	0.2794	0.0277	0.0000	3.64E-08
213	0.00	0.000	0.020	0.2774	0.0277	0.0000	3.64E-08
214	0.00	0.000	0.002	0.2772	0.0277	0.0000	3.64E-08
215	0.00	0.000	0.002	0.2770	0.0277	0.0000	3.64E-08
216	0.00	0.000	0.000	0.2770	0.0276	0.0000	3.64E-08

217	0.00	0.000	0.000	0.2770	0.0276	0.0000	3.63E-08
218	0.00	0.000	0.000	0.2770	0.0276	0.0000	3.63E-08
219	0.67	0.489	0.026	0.2929	0.0276	0.0000	3.63E-08
220	0.00	0.000	0.008	0.2921	0.0276	0.0000	3.63E-08
221	0.00	0.000	0.018	0.2906	0.0276	0.0000	3.63E-08
222	0.00	0.000	0.015	0.2891	0.0276	0.0000	3.63E-08
223	0.00	0.000	0.013	0.2878	0.0276	0.0000	3.63E-08
224	0.00	0.000	0.011	0.2867	0.0276	0.0000	3.63E-08
225	0.00	0.000	0.014	0.2853	0.0276	0.0000	3.63E-08
226	0.72	0.548	0.026	0.3000	0.0276	0.0000	3.63E-08
227	0.00	0.000	0.110	0.2890	0.0276	0.0000	3.63E-08
228	0.00	0.000	0.097	0.2793	0.0276	0.0000	3.63E-08
229	0.00	0.000	0.011	0.2781	0.0275	0.0000	3.63E-08
230	0.00	0.000	0.006	0.2776	0.0275	0.0000	3.63E-08
231	0.00	0.000	0.004	0.2771	0.0276	0.0000	3.63E-08
232	0.11	0.000	0.014	0.2863	0.0276	0.0000	3.63E-08
233	0.03	0.000	0.024	0.2868	0.0275	0.0000	3.63E-08
234	1.92	1.752	0.040	0.2994	0.0275	0.0000	3.62E-08
235	0.00	0.000	0.055	0.2938	0.0275	0.0000	3.62E-08
236	0.00	0.000	0.123	0.2815	0.0275	0.0000	3.62E-08
237	0.00	0.000	0.033	0.2782	0.0275	0.0000	3.62E-08
238	0.09	0.000	0.025	0.2845	0.0275	0.0000	3.62E-08
239	0.01	0.000	0.030	0.2825	0.0275	0.0000	3.62E-08
240	0.07	0.000	0.039	0.2854	0.0275	0.0000	3.62E-08
241	0.00	0.000	0.025	0.2830	0.0275	0.0000	3.62E-08
242	0.00	0.000	0.024	0.2805	0.0275	0.0000	3.62E-08
243	0.00	0.000	0.023	0.2782	0.0275	0.0000	3.62E-08
244	0.00	0.000	0.009	0.2774	0.0275	0.0000	3.62E-08
245	0.00	0.000	0.003	0.2771	0.0275	0.0000	3.62E-08
246	0.00	0.000	0.000	0.2770	0.0274	0.0000	3.62E-08
247	0.00	0.000	0.000	0.2770	0.0274	0.0000	3.62E-08
248	0.00	0.000	0.000	0.2770	0.0274	0.0000	3.61E-08

249	0.00	0.000	0.000	0.2770	0.0274	0.0000	3.61E-08
250	0.00	0.000	0.000	0.2770	0.0274	0.0000	3.61E-08
251	0.01	0.000	0.005	0.2770	0.0274	0.0000	3.61E-08
252	0.00	0.000	0.000	0.2770	0.0274	0.0000	3.61E-08
253	0.00	0.000	0.000	0.2770	0.0274	0.0000	3.61E-08
254	0.13	0.000	0.012	0.2890	0.0274	0.0000	3.61E-08
255	0.69	0.535	0.030	0.3013	0.0274	0.0000	3.61E-08
256	0.00	0.000	0.010	0.3003	0.0274	0.0000	3.61E-08
257	0.00	0.000	0.013	0.2989	0.0274	0.0000	3.61E-08
258	0.07	0.000	0.027	0.3028	0.0274	0.0000	3.61E-08
259	0.00	0.000	0.016	0.3012	0.0273	0.0000	3.61E-08
260	0.00	0.000	0.013	0.2999	0.0273	0.0000	3.61E-08
261	1.65	1.482	0.028	0.3136	0.0273	0.0000	3.60E-08
262	0.01	0.000	0.248	0.2897	0.0273	0.0000	3.60E-08
263	0.58	0.247	0.253	0.2980	0.0273	0.0000	3.60E-08
264	0.00	0.000	0.163	0.2817	0.0273	0.0000	3.60E-08
265	0.00	0.000	0.040	0.2778	0.0273	0.0000	3.60E-08
266	0.02	0.000	0.020	0.2780	0.0273	0.0000	3.60E-08
267	0.00	0.000	0.006	0.2774	0.0273	0.0000	3.60E-08
268	0.00	0.000	0.003	0.2771	0.0273	0.0000	3.60E-08
269	0.00	0.000	0.001	0.2771	0.0273	0.0000	3.60E-08
270	0.00	0.000	0.000	0.2770	0.0273	0.0000	3.60E-08
271	0.00	0.000	0.000	0.2770	0.0273	0.0000	3.60E-08
272	0.00	0.000	0.000	0.2770	0.0272	0.0000	3.60E-08
273	0.14	0.000	0.020	0.2891	0.0272	0.0000	3.60E-08
274	0.00	0.000	0.010	0.2882	0.0272	0.0000	3.60E-08
275	0.00	0.000	0.012	0.2870	0.0272	0.0000	3.59E-08
276	0.00	0.000	0.014	0.2856	0.0272	0.0000	3.59E-08
277	0.00	0.000	0.014	0.2842	0.0272	0.0000	3.59E-08
278	0.00	0.000	0.013	0.2829	0.0272	0.0000	3.59E-08
279	0.00	0.000	0.013	0.2816	0.0272	0.0000	3.59E-08
280	0.00	0.000	0.013	0.2803	0.0272	0.0000	3.59E-08

281		0.00	0.000	0.012	0.2791	0.0272	0.0000	3.59E-08
282		0.00	0.000	0.012	0.2780	0.0272	0.0000	3.59E-08
283		0.00	0.000	0.007	0.2772	0.0272	0.0000	3.59E-08
284		0.00	0.000	0.002	0.2771	0.0272	0.0000	3.59E-08
285		0.00	0.000	0.000	0.2770	0.0271	0.0000	3.59E-08
286		0.00	0.000	0.000	0.2770	0.0271	0.0000	3.59E-08
287		0.68	0.491	0.025	0.2933	0.0271	0.0000	3.59E-08
288		0.00	0.000	0.026	0.2906	0.0271	0.0000	3.59E-08
289		0.00	0.000	0.010	0.2896	0.0271	0.0000	3.58E-08
290		0.00	0.000	0.010	0.2887	0.0271	0.0000	3.58E-08
291		0.00	0.000	0.009	0.2878	0.0271	0.0000	3.58E-08
292		0.00	0.000	0.009	0.2869	0.0271	0.0000	3.58E-08
293		0.00	0.000	0.009	0.2860	0.0271	0.0000	3.58E-08
294		0.00	0.000	0.009	0.2851	0.0271	0.0000	3.58E-08
295		0.00	0.000	0.008	0.2842	0.0271	0.0000	3.58E-08
296		0.00	0.000	0.008	0.2834	0.0271	0.0000	3.58E-08
297		0.00	0.000	0.008	0.2826	0.0271	0.0000	3.58E-08
298	*	0.00	0.000	0.008	0.2818	0.0271	0.0000	3.58E-08
299		0.00	0.000	0.008	0.2810	0.0270	0.0000	3.58E-08
300		0.00	0.000	0.008	0.2802	0.0270	0.0000	3.58E-08
301		0.00	0.000	0.007	0.2795	0.0270	0.0000	3.58E-08
302		0.00	0.000	0.008	0.2787	0.0270	0.0000	3.58E-08
303		0.01	0.000	0.015	0.2781	0.0270	0.0000	3.58E-08
304	*	0.00	0.000	0.009	0.2772	0.0270	0.0000	3.57E-08
305		0.45	0.275	0.021	0.2927	0.0270	0.0000	3.57E-08
306		0.00	0.000	0.047	0.2880	0.0270	0.0000	3.57E-08
307		0.01	0.000	0.014	0.2876	0.0270	0.0000	3.58E-08
308		0.00	0.000	0.007	0.2869	0.0272	0.0000	3.59E-08
309		0.00	0.000	0.007	0.2862	0.0271	0.0000	3.59E-08
310		0.09	0.000	0.017	0.2933	0.0271	0.0000	3.59E-08
311		0.00	0.000	0.085	0.2849	0.0271	0.0000	3.59E-08
312		1.30	1.132	0.020	0.3001	0.0271	0.0000	3.59E-08

313	*	0.00	0.000	0.000	0.3001	0.0271	0.0000	3.58E-08
314		0.71	0.521	0.059	0.3135	0.0271	0.0000	3.58E-08
315	*	0.00	0.000	0.000	0.3135	0.0271	0.0000	3.58E-08
316	*	0.00	0.000	0.024	0.3112	0.0271	0.0000	3.58E-08
317	*	0.00	0.000	0.024	0.3088	0.0271	0.0000	3.58E-08
318		0.00	0.000	0.036	0.3051	0.0271	0.0000	3.58E-08
319		0.00	0.000	0.059	0.2992	0.0271	0.0000	3.58E-08
320	*	0.00	0.000	0.035	0.2957	0.0271	0.0000	3.58E-08
321		0.01	0.000	0.071	0.2897	0.0271	0.0000	3.58E-08
322		0.01	0.000	0.106	0.2798	0.0270	0.0000	3.58E-08
323		0.00	0.000	0.023	0.2775	0.0270	0.0000	3.58E-08
324		0.01	0.000	0.013	0.2771	0.0271	0.0000	3.59E-08
325		0.00	0.000	0.001	0.2770	0.0274	0.0000	3.62E-08
326		0.00	0.000	0.000	0.2770	0.0274	0.0000	3.61E-08
327		0.00	0.000	0.000	0.2770	0.0274	0.0000	3.61E-08
328		0.00	0.000	0.000	0.2770	0.0274	0.0000	3.61E-08
329		0.00	0.000	0.000	0.2770	0.0274	0.0000	3.61E-08
330		0.00	0.000	0.000	0.2770	0.0274	0.0000	3.61E-08
331		0.80	0.599	0.033	0.2933	0.0274	0.0000	3.61E-08
332		0.00	0.000	0.021	0.2912	0.0274	0.0000	3.61E-08
333		0.00	0.000	0.050	0.2862	0.0274	0.0000	3.61E-08
334		0.10	0.000	0.065	0.2899	0.0274	0.0000	3.61E-08
335		0.07	0.000	0.046	0.2927	0.0274	0.0000	3.61E-08
336	*	0.06	0.000	0.043	0.2942	0.0274	0.0000	3.61E-08
337	*	0.03	0.000	0.041	0.2927	0.0273	0.0000	3.61E-08
338		0.06	0.000	0.028	0.2962	0.0273	0.0000	3.61E-08
339		0.00	0.000	0.020	0.2941	0.0273	0.0000	3.61E-08
340		0.00	0.000	0.019	0.2922	0.0273	0.0000	3.60E-08
341	*	0.11	0.000	0.051	0.2942	0.0273	0.0000	3.60E-08
342	*	0.00	0.000	0.029	0.2952	0.0273	0.0000	3.60E-08
343		0.00	0.000	0.017	0.2935	0.0273	0.0000	3.60E-08
344		0.00	0.000	0.018	0.2917	0.0273	0.0000	3.60E-08

345		0.43	0.260	0.032	0.3058	0.0273	0.0000	3.60E-08
346		0.00	0.000	0.068	0.2990	0.0273	0.0000	3.60E-08
347		1.66	1.404	0.120	0.3128	0.0273	0.0000	3.60E-08
348		0.04	0.000	0.077	0.3088	0.0273	0.0000	3.60E-08
349		0.03	0.000	0.051	0.3063	0.0273	0.0000	3.60E-08
350	*	0.25	0.000	0.024	0.3083	0.0272	0.0000	3.60E-08
351		0.18	0.241	0.026	0.3210	0.0272	0.0000	3.60E-08
352		0.00	0.000	0.083	0.3127	0.0272	0.0000	3.60E-08
353		0.00	0.000	0.061	0.3066	0.0272	0.0000	3.59E-08
354		0.01	0.000	0.100	0.2972	0.0272	0.0000	3.59E-08
355		0.00	0.000	0.042	0.2930	0.0273	0.0000	3.60E-08
356		0.00	0.000	0.089	0.2841	0.0273	0.0000	3.60E-08
357		0.03	0.000	0.083	0.2788	0.0273	0.0000	3.60E-08
358		0.00	0.000	0.009	0.2779	0.0273	0.0000	3.60E-08
359		0.00	0.000	0.006	0.2772	0.0273	0.0000	3.60E-08
360		0.00	0.000	0.002	0.2771	0.0273	0.0000	3.60E-08
361		0.00	0.000	0.000	0.2770	0.0273	0.0000	3.60E-08
362		0.00	0.000	0.000	0.2770	0.0272	0.0000	3.60E-08
363		0.00	0.000	0.000	0.2770	0.0272	0.0000	3.60E-08
364		0.00	0.000	0.000	0.2770	0.0272	0.0000	3.60E-08
365		0.00	0.000	0.000	0.2770	0.0272	0.0000	3.59E-08

* = Frozen (air or soil)

Annual Totals for Year 2			
	inches	cubic feet	percent
Precipitation	36.26	131,616.7	100.00
Runoff	25.259	91,689.6	69.66
Evapotranspiration	11.139	40,434.4	30.72
Recirculation into Layer 1	0.0011	4.0610	0.00
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0011	4.0610	0.00
Percolation/Leakage through Layer 5	0.000013	0.0474	0.00
Average Head on Top of Layer 4	0.0270	---	---
Change in Water Storage	-0.1398	-507.3	-0.39
Soil Water at Start of Year	1,406.6126	5,106,003.6	3879.45
Soil Water at End of Year	1,406.4728	5,105,496.3	3879.06
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0011	-4.0603	0.00

Daily Output for Year 3

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.000	0.2770	0.0272	0.0000	3.59E-08
2			0.00	0.000	0.000	0.2770	0.0272	0.0000	3.59E-08
3			0.00	0.000	0.000	0.2770	0.0272	0.0000	3.59E-08
4			0.00	0.000	0.000	0.2770	0.0272	0.0000	3.59E-08
5			0.00	0.000	0.000	0.2770	0.0272	0.0000	3.59E-08
6			0.00	0.000	0.000	0.2770	0.0272	0.0000	3.59E-08
7			0.00	0.000	0.000	0.2770	0.0272	0.0000	3.59E-08
8	*		0.00	0.000	0.000	0.2770	0.0272	0.0000	3.59E-08
9	*		0.10	0.000	0.024	0.2790	0.0272	0.0000	3.59E-08
10	*		0.28	0.000	0.000	0.2809	0.0271	0.0000	3.59E-08
11			0.00	0.129	0.061	0.2936	0.0271	0.0000	3.59E-08
12			0.00	0.000	0.007	0.2930	0.0271	0.0000	3.59E-08
13			0.00	0.000	0.010	0.2919	0.0271	0.0000	3.59E-08
14			0.00	0.000	0.010	0.2909	0.0271	0.0000	3.58E-08
15	*		0.00	0.000	0.010	0.2899	0.0271	0.0000	3.58E-08
16			0.00	0.000	0.010	0.2890	0.0271	0.0000	3.58E-08
17	*		0.00	0.000	0.000	0.2890	0.0271	0.0000	3.58E-08
18	*		0.00	0.000	0.000	0.2890	0.0271	0.0000	3.58E-08
19	*		0.01	0.000	0.010	0.2890	0.0271	0.0000	3.58E-08
20	*		0.00	0.000	0.000	0.2890	0.0271	0.0000	3.58E-08
21	*		0.00	0.000	0.000	0.2890	0.0271	0.0000	3.58E-08
22			0.00	0.000	0.009	0.2880	0.0271	0.0000	3.58E-08
23			0.00	0.000	0.009	0.2871	0.0270	0.0000	3.58E-08
24			0.00	0.000	0.009	0.2862	0.0270	0.0000	3.58E-08

25		0.00	0.000	0.009	0.2853	0.0270	0.0000	3.58E-08
26		0.00	0.000	0.009	0.2845	0.0270	0.0000	3.58E-08
27	*	0.00	0.000	0.000	0.2845	0.0270	0.0000	3.58E-08
28		0.00	0.000	0.008	0.2836	0.0270	0.0000	3.57E-08
29		0.03	0.000	0.018	0.2849	0.0270	0.0000	3.57E-08
30	*	0.17	0.000	0.039	0.2869	0.0270	0.0000	3.57E-08
31	*	0.00	0.000	0.039	0.2889	0.0270	0.0000	3.57E-08
32	*	0.00	0.000	0.049	0.2895	0.0270	0.0000	3.57E-08
33		0.00	0.000	0.008	0.2887	0.0270	0.0000	3.57E-08
34		0.00	0.000	0.010	0.2877	0.0270	0.0000	3.57E-08
35		0.00	0.000	0.010	0.2867	0.0270	0.0000	3.57E-08
36		0.00	0.000	0.008	0.2859	0.0270	0.0000	3.57E-08
37		0.00	0.000	0.008	0.2850	0.0269	0.0000	3.57E-08
38	*	0.00	0.000	0.008	0.2843	0.0269	0.0000	3.57E-08
39		0.00	0.000	0.008	0.2835	0.0269	0.0000	3.57E-08
40		0.55	0.374	0.021	0.2988	0.0269	0.0000	3.57E-08
41		0.00	0.000	0.007	0.2980	0.0269	0.0000	3.57E-08
42		0.00	0.000	0.008	0.2973	0.0269	0.0000	3.56E-08
43		0.00	0.000	0.007	0.2965	0.0269	0.0000	3.56E-08
44		0.00	0.000	0.007	0.2958	0.0269	0.0000	3.56E-08
45		0.00	0.000	0.007	0.2952	0.0269	0.0000	3.56E-08
46		0.00	0.000	0.007	0.2945	0.0269	0.0000	3.56E-08
47		0.00	0.000	0.007	0.2938	0.0269	0.0000	3.56E-08
48		0.00	0.000	0.007	0.2932	0.0269	0.0000	3.56E-08
49		0.00	0.000	0.007	0.2925	0.0269	0.0000	3.56E-08
50	*	0.18	0.000	0.042	0.2945	0.0269	0.0000	3.56E-08
51	*	0.00	0.000	0.070	0.2964	0.0268	0.0000	3.56E-08
52	*	0.00	0.000	0.032	0.2958	0.0268	0.0000	3.56E-08
53		0.00	0.000	0.008	0.2950	0.0268	0.0000	3.56E-08
54		0.39	0.227	0.019	0.3089	0.0268	0.0000	3.56E-08
55		0.21	0.070	0.118	0.3111	0.0268	0.0000	3.56E-08
56		0.00	0.000	0.114	0.2996	0.0268	0.0000	3.55E-08

57		0.00	0.000	0.054	0.2943	0.0268	0.0000	3.55E-08
58		0.00	0.000	0.036	0.2906	0.0268	0.0000	3.55E-08
59		0.00	0.000	0.025	0.2882	0.0268	0.0000	3.55E-08
60		0.17	0.024	0.037	0.2992	0.0268	0.0000	3.55E-08
61	*	0.04	0.000	0.039	0.2992	0.0268	0.0000	3.55E-08
62	*	0.02	0.000	0.021	0.2992	0.0268	0.0000	3.55E-08
63	*	0.04	0.000	0.053	0.2981	0.0268	0.0000	3.55E-08
64		0.25	0.095	0.037	0.3103	0.0267	0.0000	3.55E-08
65		0.00	0.000	0.137	0.2966	0.0267	0.0000	3.55E-08
66		0.00	0.000	0.019	0.2947	0.0267	0.0000	3.55E-08
67		0.00	0.000	0.017	0.2930	0.0267	0.0000	3.55E-08
68		0.08	0.000	0.025	0.2987	0.0267	0.0000	3.55E-08
69		0.00	0.000	0.019	0.2970	0.0267	0.0000	3.54E-08
70		0.00	0.000	0.017	0.2953	0.0267	0.0000	3.54E-08
71		0.00	0.000	0.017	0.2937	0.0267	0.0000	3.54E-08
72	*	0.16	0.000	0.093	0.2956	0.0267	0.0000	3.54E-08
73		0.00	0.000	0.058	0.2944	0.0267	0.0000	3.54E-08
74	*	0.00	0.000	0.015	0.2929	0.0267	0.0000	3.54E-08
75	*	0.01	0.000	0.022	0.2915	0.0267	0.0000	3.54E-08
76		0.00	0.000	0.012	0.2904	0.0267	0.0000	3.54E-08
77		0.00	0.000	0.011	0.2893	0.0266	0.0000	3.54E-08
78		0.00	0.000	0.011	0.2882	0.0266	0.0000	3.54E-08
79		1.29	1.115	0.025	0.3036	0.0266	0.0000	3.54E-08
80		1.17	0.827	0.223	0.3152	0.0266	0.0000	3.54E-08
81		0.03	0.000	0.094	0.3090	0.0266	0.0000	3.54E-08
82	*	0.98	0.000	0.031	0.3109	0.0266	0.0000	3.54E-08
83	*	0.00	0.000	0.026	0.3129	0.0266	0.0000	3.53E-08
84	*	0.00	0.000	0.035	0.3149	0.0266	0.0000	3.53E-08
85		0.00	0.000	0.056	0.3169	0.0266	0.0000	3.53E-08
86		0.00	0.507	0.119	0.3296	0.0266	0.0000	3.53E-08
87		0.00	0.000	0.152	0.3144	0.0266	0.0000	3.53E-08
88		0.00	0.000	0.089	0.3055	0.0266	0.0000	3.53E-08

89	*	0.00	0.000	0.000	0.3055	0.0266	0.0000	3.53E-08
90	*	0.00	0.000	0.000	0.3055	0.0265	0.0000	3.53E-08
91		0.00	0.000	0.092	0.2963	0.0265	0.0000	3.53E-08
92		0.00	0.000	0.112	0.2851	0.0265	0.0000	3.53E-08
93		0.00	0.000	0.070	0.2781	0.0265	0.0000	3.53E-08
94		0.34	0.146	0.064	0.2915	0.0265	0.0000	3.53E-08
95		0.00	0.000	0.102	0.2813	0.0265	0.0000	3.53E-08
96		0.00	0.000	0.029	0.2784	0.0265	0.0000	3.52E-08
97		0.00	0.000	0.011	0.2774	0.0265	0.0000	3.52E-08
98		0.13	0.000	0.015	0.2886	0.0265	0.0000	3.52E-08
99		0.13	0.000	0.022	0.2994	0.0265	0.0000	3.52E-08
100		0.17	0.036	0.021	0.3111	0.0265	0.0000	3.52E-08
101		0.04	0.000	0.180	0.2967	0.0265	0.0000	3.52E-08
102		0.01	0.000	0.028	0.2954	0.0265	0.0000	3.52E-08
103		0.00	0.000	0.021	0.2933	0.0264	0.0000	3.52E-08
104		0.00	0.000	0.018	0.2915	0.0264	0.0000	3.52E-08
105		0.00	0.000	0.015	0.2901	0.0264	0.0000	3.52E-08
106		0.00	0.000	0.014	0.2887	0.0264	0.0000	3.52E-08
107		0.00	0.000	0.013	0.2874	0.0264	0.0000	3.52E-08
108		0.00	0.000	0.013	0.2861	0.0264	0.0000	3.52E-08
109		0.00	0.000	0.013	0.2848	0.0264	0.0000	3.52E-08
110		0.00	0.000	0.012	0.2836	0.0264	0.0000	3.51E-08
111		0.00	0.000	0.014	0.2822	0.0264	0.0000	3.51E-08
112		0.00	0.000	0.014	0.2808	0.0264	0.0000	3.51E-08
113		0.00	0.000	0.008	0.2800	0.0264	0.0000	3.51E-08
114		0.35	0.184	0.026	0.2938	0.0264	0.0000	3.51E-08
115		0.01	0.000	0.020	0.2928	0.0264	0.0000	3.51E-08
116		0.60	0.430	0.025	0.3070	0.0263	0.0000	3.51E-08
117		0.32	0.138	0.138	0.3112	0.0263	0.0000	3.51E-08
118		0.00	0.000	0.171	0.2941	0.0263	0.0000	3.51E-08
119		0.32	0.099	0.234	0.2926	0.0263	0.0000	3.51E-08
120		0.00	0.000	0.112	0.2814	0.0263	0.0000	3.51E-08

121	0.00	0.000	0.023	0.2792	0.0263	0.0000	3.51E-08
122	0.00	0.000	0.011	0.2781	0.0263	0.0000	3.51E-08
123	0.00	0.000	0.005	0.2775	0.0263	0.0000	3.51E-08
124	0.00	0.000	0.004	0.2771	0.0263	0.0000	3.50E-08
125	0.00	0.000	0.001	0.2770	0.0265	0.0000	3.53E-08
126	0.00	0.000	0.000	0.2770	0.0273	0.0000	3.60E-08
127	0.00	0.000	0.000	0.2770	0.0273	0.0000	3.60E-08
128	0.00	0.000	0.000	0.2770	0.0273	0.0000	3.60E-08
129	0.00	0.000	0.003	0.2770	0.0273	0.0000	3.60E-08
130	0.20	0.054	0.019	0.2896	0.0273	0.0000	3.60E-08
131	0.04	0.000	0.019	0.2920	0.0272	0.0000	3.60E-08
132	0.00	0.000	0.011	0.2909	0.0272	0.0000	3.60E-08
133	0.01	0.000	0.018	0.2898	0.0272	0.0000	3.60E-08
134	0.01	0.000	0.020	0.2889	0.0272	0.0000	3.59E-08
135	0.00	0.000	0.014	0.2875	0.0272	0.0000	3.59E-08
136	0.00	0.000	0.015	0.2859	0.0272	0.0000	3.59E-08
137	0.00	0.000	0.014	0.2845	0.0272	0.0000	3.59E-08
138	0.00	0.000	0.012	0.2833	0.0272	0.0000	3.59E-08
139	1.49	1.315	0.028	0.2984	0.0272	0.0000	3.59E-08
140	0.00	0.000	0.076	0.2908	0.0272	0.0000	3.59E-08
141	0.00	0.000	0.012	0.2896	0.0272	0.0000	3.59E-08
142	0.00	0.000	0.013	0.2883	0.0272	0.0000	3.59E-08
143	0.00	0.000	0.012	0.2871	0.0272	0.0000	3.59E-08
144	0.06	0.000	0.022	0.2906	0.0272	0.0000	3.59E-08
145	0.02	0.000	0.022	0.2907	0.0272	0.0000	3.59E-08
146	0.28	0.126	0.026	0.3033	0.0272	0.0000	3.59E-08
147	0.00	0.000	0.127	0.2906	0.0271	0.0000	3.59E-08
148	0.28	0.113	0.026	0.3050	0.0272	0.0000	3.59E-08
149	0.00	0.000	0.191	0.2862	0.0272	0.0000	3.59E-08
150	0.00	0.000	0.015	0.2846	0.0272	0.0000	3.59E-08
151	0.51	0.329	0.026	0.3006	0.0272	0.0000	3.59E-08
152	0.11	0.000	0.122	0.2996	0.0272	0.0000	3.59E-08

153	0.60	0.287	0.274	0.3031	0.0272	0.0000	3.59E-08
154	1.43	1.137	0.178	0.3144	0.0272	0.0000	3.59E-08
155	0.01	0.000	0.209	0.2947	0.0272	0.0000	3.59E-08
156	0.00	0.000	0.138	0.2809	0.0272	0.0000	3.59E-08
157	0.00	0.000	0.031	0.2777	0.0271	0.0000	3.59E-08
158	0.00	0.000	0.006	0.2771	0.0271	0.0000	3.59E-08
159	0.13	0.000	0.016	0.2882	0.0271	0.0000	3.59E-08
160	0.02	0.000	0.027	0.2873	0.0271	0.0000	3.58E-08
161	0.94	0.764	0.046	0.3001	0.0271	0.0000	3.58E-08
162	0.03	0.000	0.181	0.2849	0.0271	0.0000	3.58E-08
163	0.00	0.000	0.023	0.2826	0.0271	0.0000	3.58E-08
164	0.00	0.000	0.024	0.2803	0.0271	0.0000	3.58E-08
165	0.00	0.000	0.020	0.2783	0.0271	0.0000	3.58E-08
166	0.00	0.000	0.007	0.2776	0.0271	0.0000	3.58E-08
167	0.00	0.000	0.005	0.2771	0.0271	0.0000	3.58E-08
168	0.00	0.000	0.001	0.2770	0.0271	0.0000	3.58E-08
169	0.00	0.000	0.000	0.2770	0.0270	0.0000	3.58E-08
170	0.00	0.000	0.000	0.2770	0.0270	0.0000	3.58E-08
171	0.00	0.000	0.000	0.2770	0.0270	0.0000	3.58E-08
172	0.00	0.000	0.000	0.2770	0.0270	0.0000	3.58E-08
173	0.00	0.000	0.004	0.2770	0.0270	0.0000	3.58E-08
174	0.00	0.000	0.000	0.2770	0.0270	0.0000	3.57E-08
175	0.00	0.000	0.000	0.2770	0.0270	0.0000	3.57E-08
176	0.04	0.000	0.012	0.2799	0.0270	0.0000	3.57E-08
177	0.00	0.000	0.002	0.2797	0.0270	0.0000	3.57E-08
178	0.00	0.000	0.006	0.2791	0.0270	0.0000	3.57E-08
179	0.00	0.000	0.003	0.2788	0.0270	0.0000	3.57E-08
180	0.28	0.115	0.026	0.2931	0.0270	0.0000	3.57E-08
181	0.16	0.032	0.019	0.3040	0.0270	0.0000	3.57E-08
182	0.05	0.000	0.019	0.3076	0.0270	0.0000	3.57E-08
183	0.00	0.000	0.013	0.3062	0.0269	0.0000	3.57E-08
184	0.00	0.000	0.011	0.3051	0.0269	0.0000	3.57E-08

185	0.00	0.000	0.016	0.3039	0.0269	0.0000	3.57E-08
186	0.00	0.000	0.011	0.3028	0.0269	0.0000	3.57E-08
187	0.00	0.000	0.014	0.3014	0.0269	0.0000	3.56E-08
188	0.00	0.000	0.012	0.3002	0.0269	0.0000	3.56E-08
189	0.23	0.077	0.026	0.3128	0.0269	0.0000	3.56E-08
190	0.32	0.120	0.275	0.3055	0.0269	0.0000	3.56E-08
191	0.16	0.012	0.184	0.3023	0.0269	0.0000	3.56E-08
192	0.18	0.046	0.093	0.3069	0.0269	0.0000	3.56E-08
193	0.00	0.000	0.045	0.3025	0.0269	0.0000	3.56E-08
194	0.00	0.000	0.035	0.2990	0.0269	0.0000	3.56E-08
195	0.02	0.000	0.036	0.2973	0.0269	0.0000	3.56E-08
196	0.66	0.490	0.045	0.3102	0.0268	0.0000	3.56E-08
197	0.36	0.137	0.293	0.3029	0.0268	0.0000	3.56E-08
198	0.73	0.394	0.294	0.3067	0.0268	0.0000	3.56E-08
199	0.08	0.000	0.176	0.2973	0.0268	0.0000	3.56E-08
200	0.00	0.000	0.134	0.2839	0.0268	0.0000	3.56E-08
201	0.00	0.000	0.052	0.2787	0.0268	0.0000	3.55E-08
202	0.00	0.000	0.013	0.2774	0.0268	0.0000	3.55E-08
203	0.23	0.085	0.034	0.2889	0.0268	0.0000	3.55E-08
204	0.09	0.000	0.031	0.2953	0.0268	0.0000	3.55E-08
205	0.00	0.000	0.016	0.2937	0.0268	0.0000	3.55E-08
206	0.00	0.000	0.025	0.2911	0.0268	0.0000	3.55E-08
207	0.00	0.000	0.027	0.2884	0.0268	0.0000	3.55E-08
208	0.00	0.000	0.021	0.2863	0.0268	0.0000	3.55E-08
209	0.00	0.000	0.023	0.2840	0.0267	0.0000	3.55E-08
210	0.00	0.000	0.020	0.2820	0.0267	0.0000	3.55E-08
211	0.00	0.000	0.018	0.2802	0.0267	0.0000	3.55E-08
212	0.00	0.000	0.017	0.2785	0.0267	0.0000	3.55E-08
213	0.00	0.000	0.013	0.2772	0.0267	0.0000	3.55E-08
214	0.00	0.000	0.001	0.2771	0.0267	0.0000	3.55E-08
215	0.00	0.000	0.001	0.2770	0.0267	0.0000	3.54E-08
216	0.00	0.000	0.000	0.2770	0.0267	0.0000	3.54E-08

217	0.00	0.000	0.000	0.2770	0.0267	0.0000	3.54E-08
218	0.00	0.000	0.000	0.2770	0.0267	0.0000	3.54E-08
219	0.02	0.000	0.013	0.2782	0.0267	0.0000	3.54E-08
220	0.00	0.000	0.002	0.2780	0.0267	0.0000	3.54E-08
221	0.00	0.000	0.004	0.2776	0.0267	0.0000	3.54E-08
222	0.00	0.000	0.004	0.2772	0.0266	0.0000	3.54E-08
223	0.00	0.000	0.001	0.2771	0.0266	0.0000	3.54E-08
224	0.00	0.000	0.001	0.2771	0.0266	0.0000	3.54E-08
225	1.29	1.100	0.031	0.2928	0.0266	0.0000	3.54E-08
226	0.16	0.012	0.099	0.2975	0.0266	0.0000	3.54E-08
227	0.15	0.007	0.098	0.3022	0.0266	0.0000	3.54E-08
228	0.00	0.000	0.063	0.2960	0.0266	0.0000	3.54E-08
229	0.00	0.000	0.041	0.2919	0.0266	0.0000	3.53E-08
230	0.00	0.000	0.035	0.2884	0.0266	0.0000	3.53E-08
231	0.48	0.279	0.052	0.3032	0.0266	0.0000	3.53E-08
232	0.00	0.000	0.092	0.2940	0.0266	0.0000	3.53E-08
233	0.00	0.000	0.030	0.2910	0.0266	0.0000	3.53E-08
234	0.00	0.000	0.027	0.2883	0.0266	0.0000	3.53E-08
235	0.00	0.000	0.022	0.2861	0.0266	0.0000	3.53E-08
236	0.00	0.000	0.024	0.2837	0.0265	0.0000	3.53E-08
237	0.00	0.000	0.023	0.2814	0.0265	0.0000	3.53E-08
238	0.00	0.000	0.024	0.2790	0.0265	0.0000	3.53E-08
239	0.00	0.000	0.011	0.2780	0.0265	0.0000	3.53E-08
240	0.68	0.481	0.042	0.2933	0.0265	0.0000	3.53E-08
241	0.00	0.000	0.100	0.2833	0.0265	0.0000	3.53E-08
242	0.00	0.000	0.018	0.2815	0.0265	0.0000	3.53E-08
243	0.00	0.000	0.019	0.2797	0.0265	0.0000	3.52E-08
244	0.00	0.000	0.021	0.2775	0.0265	0.0000	3.52E-08
245	0.00	0.000	0.003	0.2772	0.0265	0.0000	3.52E-08
246	0.38	0.204	0.032	0.2912	0.0265	0.0000	3.52E-08
247	0.00	0.000	0.070	0.2841	0.0265	0.0000	3.52E-08
248	0.00	0.000	0.056	0.2786	0.0265	0.0000	3.52E-08

249	0.44	0.176	0.149	0.2898	0.0264	0.0000	3.52E-08
250	0.06	0.000	0.118	0.2840	0.0264	0.0000	3.52E-08
251	0.25	0.087	0.071	0.2932	0.0264	0.0000	3.52E-08
252	0.86	0.424	0.358	0.3007	0.0264	0.0000	3.52E-08
253	0.00	0.000	0.158	0.2849	0.0264	0.0000	3.52E-08
254	0.00	0.000	0.040	0.2809	0.0264	0.0000	3.52E-08
255	0.00	0.000	0.020	0.2789	0.0264	0.0000	3.52E-08
256	0.00	0.000	0.010	0.2780	0.0265	0.0000	3.53E-08
257	0.00	0.000	0.007	0.2772	0.0265	0.0000	3.53E-08
258	0.00	0.000	0.002	0.2770	0.0265	0.0000	3.53E-08
259	0.00	0.000	0.000	0.2770	0.0265	0.0000	3.53E-08
260	0.00	0.000	0.000	0.2770	0.0265	0.0000	3.53E-08
261	0.00	0.000	0.000	0.2770	0.0265	0.0000	3.53E-08
262	0.00	0.000	0.000	0.2770	0.0265	0.0000	3.52E-08
263	0.00	0.000	0.000	0.2770	0.0265	0.0000	3.52E-08
264	0.00	0.000	0.000	0.2770	0.0265	0.0000	3.52E-08
265	0.00	0.000	0.000	0.2770	0.0265	0.0000	3.52E-08
266	0.00	0.000	0.000	0.2770	0.0265	0.0000	3.52E-08
267	0.00	0.000	0.000	0.2770	0.0265	0.0000	3.52E-08
268	0.00	0.000	0.000	0.2770	0.0265	0.0000	3.52E-08
269	0.33	0.164	0.029	0.2905	0.0264	0.0000	3.52E-08
270	0.00	0.000	0.007	0.2899	0.0264	0.0000	3.52E-08
271	0.00	0.000	0.011	0.2888	0.0264	0.0000	3.52E-08
272	0.00	0.000	0.010	0.2878	0.0264	0.0000	3.52E-08
273	0.00	0.000	0.010	0.2868	0.0264	0.0000	3.52E-08
274	0.00	0.000	0.010	0.2858	0.0264	0.0000	3.52E-08
275	0.00	0.000	0.010	0.2849	0.0264	0.0000	3.52E-08
276	0.00	0.000	0.009	0.2839	0.0264	0.0000	3.51E-08
277	0.00	0.000	0.009	0.2830	0.0264	0.0000	3.51E-08
278	0.00	0.000	0.009	0.2821	0.0264	0.0000	3.51E-08
279	0.00	0.000	0.009	0.2812	0.0264	0.0000	3.51E-08
280	0.35	0.179	0.025	0.2957	0.0264	0.0000	3.51E-08

281	0.00	0.000	0.008	0.2949	0.0264	0.0000	3.51E-08
282	0.00	0.000	0.009	0.2940	0.0264	0.0000	3.51E-08
283	0.00	0.000	0.008	0.2932	0.0263	0.0000	3.51E-08
284	0.00	0.000	0.008	0.2924	0.0263	0.0000	3.51E-08
285	0.00	0.000	0.008	0.2916	0.0263	0.0000	3.51E-08
286	0.00	0.000	0.008	0.2908	0.0263	0.0000	3.51E-08
287	0.00	0.000	0.008	0.2901	0.0263	0.0000	3.51E-08
288	0.00	0.000	0.010	0.2893	0.0263	0.0000	3.51E-08
289	0.00	0.000	0.008	0.2886	0.0263	0.0000	3.51E-08
290	0.00	0.000	0.008	0.2878	0.0263	0.0000	3.51E-08
291	0.00	0.000	0.008	0.2870	0.0263	0.0000	3.50E-08
292	0.00	0.000	0.008	0.2862	0.0263	0.0000	3.50E-08
293	0.00	0.000	0.007	0.2854	0.0263	0.0000	3.50E-08
294	0.00	0.000	0.007	0.2847	0.0263	0.0000	3.50E-08
295	0.00	0.000	0.008	0.2839	0.0263	0.0000	3.50E-08
296	0.00	0.000	0.008	0.2831	0.0263	0.0000	3.50E-08
297	0.00	0.000	0.007	0.2824	0.0262	0.0000	3.50E-08
298	0.00	0.000	0.008	0.2816	0.0262	0.0000	3.50E-08
299	0.00	0.000	0.008	0.2808	0.0262	0.0000	3.50E-08
300	0.02	0.000	0.019	0.2813	0.0262	0.0000	3.50E-08
301	0.03	0.000	0.021	0.2826	0.0262	0.0000	3.50E-08
302	1.41	1.259	0.024	0.2952	0.0262	0.0000	3.50E-08
303	0.12	0.000	0.092	0.2978	0.0262	0.0000	3.50E-08
304	0.00	0.000	0.009	0.2969	0.0262	0.0000	3.50E-08
305	0.05	0.000	0.021	0.2993	0.0262	0.0000	3.50E-08
306	0.03	0.000	0.021	0.3005	0.0262	0.0000	3.49E-08
307	0.38	0.232	0.024	0.3130	0.0262	0.0000	3.49E-08
308	0.01	0.000	0.076	0.3060	0.0262	0.0000	3.49E-08
309	0.00	0.000	0.115	0.2946	0.0262	0.0000	3.49E-08
310	0.00	0.000	0.106	0.2840	0.0262	0.0000	3.49E-08
311	0.00	0.000	0.052	0.2788	0.0261	0.0000	3.49E-08
312	0.00	0.000	0.015	0.2773	0.0261	0.0000	3.49E-08

313		0.00	0.000	0.002	0.2770	0.0261	0.0000	3.49E-08
314		0.00	0.000	0.000	0.2770	0.0261	0.0000	3.49E-08
315		0.00	0.000	0.000	0.2770	0.0261	0.0000	3.49E-08
316		0.00	0.000	0.000	0.2770	0.0261	0.0000	3.49E-08
317		0.00	0.000	0.000	0.2770	0.0261	0.0000	3.49E-08
318		0.08	0.000	0.015	0.2833	0.0261	0.0000	3.49E-08
319		0.00	0.000	0.010	0.2823	0.0261	0.0000	3.48E-08
320		0.00	0.000	0.011	0.2812	0.0261	0.0000	3.48E-08
321	*	0.00	0.000	0.000	0.2812	0.0261	0.0000	3.48E-08
322	*	0.00	0.000	0.000	0.2812	0.0261	0.0000	3.48E-08
323		0.00	0.000	0.012	0.2800	0.0261	0.0000	3.48E-08
324		0.96	0.781	0.030	0.2948	0.0261	0.0000	3.48E-08
325		0.09	0.000	0.050	0.2988	0.0260	0.0000	3.48E-08
326		0.17	0.018	0.052	0.3089	0.0260	0.0000	3.48E-08
327		0.05	0.000	0.071	0.3066	0.0260	0.0000	3.48E-08
328		0.00	0.000	0.047	0.3019	0.0260	0.0000	3.48E-08
329		0.00	0.000	0.057	0.2963	0.0260	0.0000	3.48E-08
330		0.00	0.000	0.083	0.2879	0.0260	0.0000	3.48E-08
331		0.54	0.317	0.065	0.3034	0.0260	0.0000	3.48E-08
332		0.00	0.000	0.118	0.2916	0.0260	0.0000	3.48E-08
333		0.00	0.000	0.062	0.2854	0.0260	0.0000	3.48E-08
334		0.00	0.000	0.071	0.2783	0.0260	0.0000	3.48E-08
335		0.00	0.000	0.010	0.2773	0.0260	0.0000	3.48E-08
336		0.00	0.000	0.002	0.2772	0.0260	0.0000	3.48E-08
337		0.06	0.000	0.016	0.2820	0.0260	0.0000	3.47E-08
338		0.00	0.000	0.013	0.2806	0.0260	0.0000	3.47E-08
339		0.00	0.000	0.016	0.2790	0.0260	0.0000	3.47E-08
340	*	0.00	0.000	0.000	0.2790	0.0260	0.0000	3.47E-08
341	*	0.00	0.000	0.000	0.2790	0.0260	0.0000	3.47E-08
342		0.00	0.000	0.007	0.2784	0.0259	0.0000	3.47E-08
343	*	0.00	0.000	0.000	0.2784	0.0259	0.0000	3.47E-08
344		0.00	0.000	0.005	0.2779	0.0259	0.0000	3.47E-08

345		0.00	0.000	0.004	0.2775	0.0259	0.0000	3.47E-08
346	*	0.06	0.000	0.023	0.2795	0.0259	0.0000	3.47E-08
347		0.08	0.000	0.028	0.2861	0.0259	0.0000	3.47E-08
348	*	0.00	0.000	0.000	0.2861	0.0259	0.0000	3.47E-08
349		0.05	0.000	0.020	0.2891	0.0259	0.0000	3.47E-08
350		0.01	0.000	0.016	0.2884	0.0259	0.0000	3.47E-08
351		0.02	0.000	0.018	0.2886	0.0259	0.0000	3.46E-08
352		0.07	0.000	0.022	0.2937	0.0259	0.0000	3.46E-08
353		0.00	0.000	0.009	0.2930	0.0259	0.0000	3.46E-08
354		0.14	0.002	0.021	0.3048	0.0259	0.0000	3.46E-08
355		1.57	1.431	0.028	0.3165	0.0258	0.0000	3.46E-08
356		0.02	0.000	0.073	0.3110	0.0258	0.0000	3.46E-08
357		0.02	0.000	0.085	0.3046	0.0258	0.0000	3.46E-08
358		0.28	0.101	0.065	0.3160	0.0258	0.0000	3.46E-08
359		0.03	0.000	0.062	0.3128	0.0258	0.0000	3.46E-08
360		0.00	0.000	0.045	0.3084	0.0258	0.0000	3.46E-08
361	*	0.00	0.000	0.000	0.3084	0.0258	0.0000	3.46E-08
362	*	0.00	0.000	0.000	0.3084	0.0258	0.0000	3.46E-08
363		0.00	0.000	0.054	0.3030	0.0258	0.0000	3.46E-08
364		0.00	0.000	0.043	0.2987	0.0258	0.0000	3.46E-08
365	*	0.00	0.000	0.000	0.2987	0.0258	0.0000	3.45E-08

* = Frozen (air or soil)

Annual Totals for Year 3			
	inches	cubic feet	percent
Precipitation	30.17	109,519.4	100.00
Runoff	17.288	62,755.1	57.30
Evapotranspiration	12.666	45,978.5	41.98
Recirculation into Layer 1	0.0011	3.9983	0.00
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0011	3.9983	0.00
Percolation/Leakage through Layer 5	0.000013	0.0469	0.00
Average Head on Top of Layer 4	0.0266	---	---
Change in Water Storage	0.2165	785.8	0.72
Soil Water at Start of Year	1,406.4728	5,105,496.3	4661.73
Soil Water at End of Year	1,406.6893	5,106,282.0	4662.45
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0011	-3.9989	0.00

Daily Output for Year 4

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.052	0.2935	0.0258	0.0000	3.45E-08
2			0.00	0.000	0.058	0.2878	0.0258	0.0000	3.45E-08
3			0.00	0.000	0.044	0.2833	0.0258	0.0000	3.45E-08
4			0.00	0.000	0.038	0.2796	0.0257	0.0000	3.45E-08
5			0.00	0.000	0.023	0.2772	0.0257	0.0000	3.45E-08
6			0.02	0.000	0.014	0.2780	0.0257	0.0000	3.45E-08
7			0.05	0.000	0.014	0.2819	0.0257	0.0000	3.45E-08
8			0.11	0.000	0.022	0.2907	0.0257	0.0000	3.45E-08
9			0.00	0.000	0.010	0.2897	0.0257	0.0000	3.45E-08
10			0.38	0.209	0.034	0.3036	0.0257	0.0000	3.45E-08
11			0.00	0.000	0.053	0.2983	0.0257	0.0000	3.45E-08
12			0.33	0.163	0.033	0.3121	0.0257	0.0000	3.45E-08
13			0.02	0.000	0.105	0.3036	0.0257	0.0000	3.45E-08
14			0.17	0.029	0.065	0.3112	0.0257	0.0000	3.44E-08
15			0.00	0.000	0.113	0.2999	0.0257	0.0000	3.44E-08
16			0.00	0.000	0.125	0.2874	0.0257	0.0000	3.44E-08
17			0.00	0.000	0.086	0.2787	0.0257	0.0000	3.44E-08
18			0.00	0.000	0.015	0.2775	0.0259	0.0000	3.46E-08
19	*		0.00	0.000	0.000	0.2775	0.0261	0.0000	3.48E-08
20			0.00	0.000	0.003	0.2772	0.0261	0.0000	3.48E-08
21	*		0.00	0.000	0.000	0.2772	0.0261	0.0000	3.48E-08
22	*		0.00	0.000	0.000	0.2772	0.0261	0.0000	3.48E-08
23			0.00	0.000	0.001	0.2770	0.0260	0.0000	3.48E-08
24			0.00	0.000	0.000	0.2770	0.0260	0.0000	3.48E-08

25			0.07	0.000	0.014	0.2827	0.0260	0.0000	3.48E-08
26	*		0.00	0.000	0.000	0.2827	0.0260	0.0000	3.48E-08
27	*		0.00	0.000	0.000	0.2827	0.0260	0.0000	3.48E-08
28	*		0.18	0.000	0.011	0.2847	0.0260	0.0000	3.48E-08
29	*		0.40	0.000	0.019	0.2867	0.0260	0.0000	3.48E-08
30	*		0.00	0.000	0.025	0.2886	0.0260	0.0000	3.48E-08
31	*		0.00	0.000	0.014	0.2906	0.0260	0.0000	3.48E-08
32	*		0.00	0.000	0.019	0.2926	0.0260	0.0000	3.47E-08
33			0.00	0.218	0.042	0.3053	0.0260	0.0000	3.47E-08
34	*		0.05	0.000	0.048	0.3054	0.0260	0.0000	3.47E-08
35			0.35	0.167	0.037	0.3198	0.0260	0.0000	3.47E-08
36			0.62	0.376	0.149	0.3291	0.0260	0.0000	3.47E-08
37			0.94	0.743	0.085	0.3408	0.0259	0.0000	3.47E-08
38			0.00	0.000	0.103	0.3305	0.0259	0.0000	3.47E-08
39			0.00	0.000	0.054	0.3251	0.0259	0.0000	3.47E-08
40	*		0.00	0.000	0.000	0.3251	0.0259	0.0000	3.47E-08
41	*		0.00	0.000	0.000	0.3251	0.0259	0.0000	3.47E-08
42	*		0.00	0.000	0.000	0.3251	0.0259	0.0000	3.47E-08
43	*		0.00	0.000	0.000	0.3251	0.0259	0.0000	3.47E-08
44	*	*	0.00	0.000	0.000	0.3251	0.0259	0.0000	3.47E-08
45	*	*	0.57	0.000	0.004	0.3251	0.0259	0.0000	3.47E-08
46	*	*	0.00	0.000	0.014	0.3251	0.0259	0.0000	3.46E-08
47	*	*	0.33	0.000	0.022	0.3251	0.0259	0.0000	3.46E-08
48	*	*	0.32	0.000	0.011	0.3251	0.0259	0.0000	3.46E-08
49	*	*	0.00	0.000	0.026	0.3251	0.0259	0.0000	3.46E-08
50	*	*	0.00	0.000	0.029	0.3251	0.0258	0.0000	3.46E-08
51		*	0.00	1.081	0.000	0.3279	0.0258	0.0000	3.46E-08
52		*	0.00	0.000	0.000	0.3279	0.0258	0.0000	3.46E-08
53			0.00	0.000	0.113	0.3166	0.0258	0.0000	3.46E-08
54			0.00	0.000	0.111	0.3055	0.0258	0.0000	3.46E-08
55			0.00	0.000	0.114	0.2941	0.0258	0.0000	3.46E-08
56			0.00	0.000	0.128	0.2814	0.0258	0.0000	3.46E-08

57			0.00	0.000	0.038	0.2776	0.0258	0.0000	3.46E-08
58			0.00	0.000	0.005	0.2770	0.0264	0.0000	3.51E-08
59			0.00	0.000	0.000	0.2770	0.0285	0.0000	3.72E-08
60	*		0.36	0.000	0.040	0.2790	0.0285	0.0000	3.72E-08
61	*		0.15	0.000	0.043	0.2809	0.0285	0.0000	3.72E-08
62	*		0.00	0.000	0.022	0.2829	0.0285	0.0000	3.71E-08
63	*		0.00	0.000	0.015	0.2849	0.0285	0.0000	3.71E-08
64	*		0.01	0.000	0.009	0.2868	0.0285	0.0000	3.71E-08
65	*	*	0.00	0.000	0.027	0.2868	0.0284	0.0000	3.71E-08
66	*	*	0.00	0.000	0.017	0.2868	0.0284	0.0000	3.71E-08
67	*	*	0.00	0.000	0.034	0.2868	0.0284	0.0000	3.71E-08
68		*	1.20	1.404	0.000	0.2880	0.0284	0.0000	3.71E-08
69	*	*	0.00	0.000	0.000	0.2880	0.0284	0.0000	3.71E-08
70		*	0.36	0.348	0.012	0.2880	0.0284	0.0000	3.71E-08
71		*	0.07	0.000	0.012	0.2940	0.0284	0.0000	3.71E-08
72			0.01	0.000	0.045	0.2901	0.0284	0.0000	3.71E-08
73			0.41	0.159	0.116	0.3037	0.0284	0.0000	3.71E-08
74			0.00	0.000	0.034	0.3002	0.0284	0.0000	3.71E-08
75			0.00	0.000	0.069	0.2933	0.0284	0.0000	3.70E-08
76			0.00	0.000	0.099	0.2834	0.0284	0.0000	3.70E-08
77			0.00	0.000	0.048	0.2786	0.0283	0.0000	3.70E-08
78	*		0.00	0.000	0.012	0.2773	0.0283	0.0000	3.70E-08
79			0.00	0.000	0.003	0.2771	0.0283	0.0000	3.70E-08
80			0.00	0.000	0.000	0.2770	0.0283	0.0000	3.70E-08
81			0.10	0.000	0.016	0.2856	0.0283	0.0000	3.70E-08
82			0.23	0.078	0.029	0.2976	0.0283	0.0000	3.70E-08
83	*		0.00	0.000	0.022	0.2957	0.0283	0.0000	3.70E-08
84			0.08	0.000	0.068	0.2971	0.0283	0.0000	3.70E-08
85			0.00	0.000	0.069	0.2902	0.0283	0.0000	3.70E-08
86			0.30	0.099	0.140	0.2966	0.0283	0.0000	3.70E-08
87			0.09	0.000	0.134	0.2922	0.0283	0.0000	3.69E-08
88			0.03	0.000	0.049	0.2904	0.0283	0.0000	3.70E-08

89		0.10	0.000	0.044	0.2964	0.0285	0.0000	3.72E-08
90		0.02	0.000	0.039	0.2946	0.0285	0.0000	3.71E-08
91		0.02	0.000	0.037	0.2933	0.0285	0.0000	3.71E-08
92		0.89	0.726	0.040	0.3062	0.0285	0.0000	3.71E-08
93		0.31	0.144	0.075	0.3154	0.0284	0.0000	3.71E-08
94		0.67	0.389	0.223	0.3213	0.0284	0.0000	3.71E-08
95		0.00	0.000	0.127	0.3085	0.0284	0.0000	3.71E-08
96		0.00	0.000	0.159	0.2926	0.0286	0.0000	3.73E-08
97		0.00	0.000	0.137	0.2789	0.0287	0.0000	3.74E-08
98		0.00	0.000	0.011	0.2778	0.0287	0.0000	3.74E-08
99		0.00	0.000	0.004	0.2774	0.0287	0.0000	3.73E-08
100		0.02	0.000	0.018	0.2781	0.0287	0.0000	3.73E-08
101		0.89	0.687	0.047	0.2932	0.0287	0.0000	3.73E-08
102		0.19	0.059	0.039	0.3027	0.0287	0.0000	3.73E-08
103		1.63	1.364	0.151	0.3143	0.0286	0.0000	3.73E-08
104		0.00	0.000	0.099	0.3044	0.0286	0.0000	3.73E-08
105		0.00	0.000	0.105	0.2939	0.0286	0.0000	3.73E-08
106		0.00	0.000	0.152	0.2787	0.0286	0.0000	3.73E-08
107		0.00	0.000	0.009	0.2779	0.0286	0.0000	3.73E-08
108		0.00	0.000	0.006	0.2772	0.0286	0.0000	3.73E-08
109		0.00	0.000	0.004	0.2770	0.0307	0.0000	3.92E-08
110		0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
111		0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
112		0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
113		0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
114		0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
115		0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
116		0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
117		0.11	0.000	0.014	0.2866	0.0318	0.0000	4.04E-08
118		0.13	0.000	0.020	0.2978	0.0318	0.0000	4.04E-08
119		0.03	0.000	0.019	0.2991	0.0318	0.0000	4.03E-08
120	*	0.00	0.000	0.012	0.2979	0.0318	0.0000	4.03E-08

121	*	1.03	0.000	0.043	0.2999	0.0318	0.0000	4.03E-08
122		4.75	5.591	0.000	0.3126	0.0318	0.0000	4.03E-08
123	*	0.00	0.000	0.078	0.3048	0.0318	0.0000	4.03E-08
124		0.00	0.000	0.100	0.2948	0.0318	0.0000	4.03E-08
125		0.00	0.000	0.149	0.2800	0.0318	0.0000	4.03E-08
126		0.12	0.000	0.049	0.2873	0.0318	0.0000	4.03E-08
127		0.31	0.108	0.068	0.3002	0.0318	0.0000	4.03E-08
128		0.20	0.072	0.032	0.3102	0.0317	0.0000	4.03E-08
129		0.14	0.006	0.175	0.3065	0.0317	0.0000	4.03E-08
130		0.53	0.360	0.048	0.3191	0.0317	0.0000	4.03E-08
131		0.11	0.002	0.263	0.3040	0.0317	0.0000	4.02E-08
132		0.04	0.000	0.236	0.2845	0.0317	0.0000	4.02E-08
133		0.01	0.000	0.068	0.2787	0.0317	0.0000	4.02E-08
134		0.00	0.000	0.013	0.2774	0.0317	0.0000	4.02E-08
135		0.20	0.050	0.033	0.2890	0.0318	0.0000	4.03E-08
136		0.32	0.161	0.048	0.3005	0.0318	0.0000	4.03E-08
137		0.00	0.000	0.014	0.2991	0.0317	0.0000	4.03E-08
138		0.00	0.000	0.020	0.2971	0.0317	0.0000	4.03E-08
139		0.50	0.315	0.040	0.3120	0.0317	0.0000	4.03E-08
140		0.00	0.000	0.204	0.2915	0.0317	0.0000	4.02E-08
141		0.00	0.000	0.023	0.2892	0.0317	0.0000	4.02E-08
142		0.07	0.000	0.037	0.2927	0.0317	0.0000	4.02E-08
143		0.72	0.565	0.038	0.3045	0.0317	0.0000	4.02E-08
144		0.00	0.000	0.141	0.2904	0.0317	0.0000	4.02E-08
145		0.00	0.000	0.108	0.2796	0.0317	0.0000	4.02E-08
146		0.11	0.000	0.043	0.2866	0.0317	0.0000	4.02E-08
147		0.10	0.000	0.039	0.2931	0.0317	0.0000	4.03E-08
148		0.00	0.000	0.020	0.2911	0.0320	0.0000	4.05E-08
149		0.00	0.000	0.027	0.2884	0.0320	0.0000	4.05E-08
150		0.02	0.000	0.033	0.2873	0.0320	0.0000	4.05E-08
151		0.09	0.000	0.035	0.2930	0.0320	0.0000	4.05E-08
152		0.00	0.000	0.019	0.2911	0.0320	0.0000	4.05E-08

153	0.00	0.000	0.019	0.2893	0.0320	0.0000	4.05E-08
154	0.01	0.000	0.026	0.2877	0.0320	0.0000	4.05E-08
155	0.00	0.000	0.020	0.2858	0.0319	0.0000	4.05E-08
156	0.00	0.000	0.017	0.2841	0.0319	0.0000	4.04E-08
157	0.00	0.000	0.018	0.2823	0.0319	0.0000	4.04E-08
158	0.00	0.000	0.017	0.2806	0.0319	0.0000	4.04E-08
159	0.00	0.000	0.015	0.2791	0.0319	0.0000	4.04E-08
160	0.00	0.000	0.011	0.2780	0.0319	0.0000	4.04E-08
161	0.00	0.000	0.011	0.2774	0.0319	0.0000	4.04E-08
162	0.00	0.000	0.003	0.2771	0.0319	0.0000	4.04E-08
163	0.00	0.000	0.001	0.2770	0.0319	0.0000	4.04E-08
164	0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
165	0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
166	0.00	0.000	0.000	0.2770	0.0318	0.0000	4.04E-08
167	0.15	0.006	0.021	0.2897	0.0318	0.0000	4.04E-08
168	0.11	0.000	0.020	0.2991	0.0318	0.0000	4.03E-08
169	0.00	0.000	0.009	0.2982	0.0318	0.0000	4.03E-08
170	0.00	0.000	0.016	0.2969	0.0318	0.0000	4.03E-08
171	0.00	0.000	0.012	0.2957	0.0318	0.0000	4.03E-08
172	0.00	0.000	0.012	0.2944	0.0318	0.0000	4.03E-08
173	0.00	0.000	0.013	0.2931	0.0318	0.0000	4.03E-08
174	0.00	0.000	0.011	0.2921	0.0318	0.0000	4.03E-08
175	1.57	1.399	0.028	0.3065	0.0318	0.0000	4.03E-08
176	0.15	0.009	0.092	0.3111	0.0318	0.0000	4.03E-08
177	0.00	0.000	0.225	0.2886	0.0317	0.0000	4.03E-08
178	0.00	0.000	0.088	0.2799	0.0317	0.0000	4.03E-08
179	0.07	0.000	0.039	0.2827	0.0317	0.0000	4.03E-08
180	0.00	0.000	0.025	0.2802	0.0317	0.0000	4.03E-08
181	0.00	0.000	0.015	0.2788	0.0317	0.0000	4.03E-08
182	0.00	0.000	0.009	0.2779	0.0317	0.0000	4.02E-08
183	0.00	0.000	0.007	0.2772	0.0318	0.0000	4.03E-08
184	0.00	0.000	0.002	0.2770	0.0319	0.0000	4.04E-08

185	0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
186	0.00	0.000	0.000	0.2770	0.0318	0.0000	4.04E-08
187	0.00	0.000	0.000	0.2770	0.0318	0.0000	4.04E-08
188	0.00	0.000	0.000	0.2770	0.0318	0.0000	4.03E-08
189	0.22	0.070	0.024	0.2895	0.0318	0.0000	4.03E-08
190	0.00	0.000	0.013	0.2882	0.0318	0.0000	4.03E-08
191	0.36	0.179	0.034	0.3024	0.0318	0.0000	4.03E-08
192	0.47	0.318	0.040	0.3132	0.0318	0.0000	4.03E-08
193	0.24	0.078	0.288	0.3009	0.0318	0.0000	4.03E-08
194	1.57	1.271	0.184	0.3121	0.0318	0.0000	4.03E-08
195	0.00	0.000	0.237	0.2884	0.0318	0.0000	4.03E-08
196	0.00	0.000	0.096	0.2788	0.0318	0.0000	4.03E-08
197	0.00	0.000	0.012	0.2776	0.0318	0.0000	4.03E-08
198	0.00	0.000	0.003	0.2772	0.0322	0.0000	4.07E-08
199	0.16	0.010	0.036	0.2887	0.0334	0.0000	4.19E-08
200	0.00	0.000	0.019	0.2868	0.0336	0.0000	4.20E-08
201	0.00	0.000	0.026	0.2841	0.0337	0.0000	4.22E-08
202	0.00	0.000	0.026	0.2815	0.0337	0.0000	4.21E-08
203	0.00	0.000	0.022	0.2793	0.0337	0.0000	4.21E-08
204	0.00	0.000	0.017	0.2776	0.0337	0.0000	4.21E-08
205	0.00	0.000	0.003	0.2773	0.0337	0.0000	4.21E-08
206	0.00	0.000	0.002	0.2771	0.0337	0.0000	4.21E-08
207	0.00	0.000	0.001	0.2770	0.0337	0.0000	4.21E-08
208	0.00	0.000	0.000	0.2770	0.0337	0.0000	4.22E-08
209	0.00	0.000	0.000	0.2770	0.0338	0.0000	4.22E-08
210	0.00	0.000	0.000	0.2770	0.0338	0.0000	4.22E-08
211	0.00	0.000	0.000	0.2770	0.0338	0.0000	4.22E-08
212	1.04	0.844	0.035	0.2928	0.0338	0.0000	4.22E-08
213	0.14	0.004	0.026	0.3035	0.0338	0.0000	4.22E-08
214	0.05	0.000	0.072	0.3015	0.0337	0.0000	4.22E-08
215	0.00	0.000	0.016	0.2999	0.0337	0.0000	4.22E-08
216	0.00	0.000	0.019	0.2981	0.0337	0.0000	4.21E-08

217	0.00	0.000	0.016	0.2965	0.0337	0.0000	4.21E-08
218	0.00	0.000	0.020	0.2945	0.0337	0.0000	4.21E-08
219	0.37	0.198	0.038	0.3081	0.0337	0.0000	4.21E-08
220	0.00	0.000	0.195	0.2886	0.0337	0.0000	4.21E-08
221	0.00	0.000	0.024	0.2862	0.0337	0.0000	4.21E-08
222	0.00	0.000	0.025	0.2836	0.0337	0.0000	4.21E-08
223	0.00	0.000	0.027	0.2809	0.0337	0.0000	4.21E-08
224	0.00	0.000	0.024	0.2785	0.0337	0.0000	4.21E-08
225	1.04	0.853	0.044	0.2932	0.0336	0.0000	4.21E-08
226	0.26	0.072	0.175	0.2942	0.0336	0.0000	4.21E-08
227	0.00	0.000	0.051	0.2891	0.0336	0.0000	4.21E-08
228	0.00	0.000	0.076	0.2815	0.0336	0.0000	4.21E-08
229	0.00	0.000	0.028	0.2787	0.0336	0.0000	4.20E-08
230	0.58	0.301	0.141	0.2926	0.0336	0.0000	4.20E-08
231	0.00	0.000	0.113	0.2814	0.0336	0.0000	4.20E-08
232	0.00	0.000	0.024	0.2791	0.0336	0.0000	4.20E-08
233	0.00	0.000	0.011	0.2780	0.0336	0.0000	4.20E-08
234	0.00	0.000	0.008	0.2772	0.0337	0.0000	4.21E-08
235	0.00	0.000	0.002	0.2771	0.0338	0.0000	4.22E-08
236	0.00	0.000	0.000	0.2770	0.0340	0.0000	4.24E-08
237	0.00	0.000	0.000	0.2770	0.0342	0.0000	4.26E-08
238	0.00	0.000	0.000	0.2770	0.0342	0.0000	4.26E-08
239	0.00	0.000	0.000	0.2770	0.0342	0.0000	4.26E-08
240	0.27	0.114	0.030	0.2891	0.0342	0.0000	4.26E-08
241	0.15	0.015	0.026	0.2998	0.0342	0.0000	4.26E-08
242	0.05	0.000	0.028	0.3016	0.0342	0.0000	4.26E-08
243	0.24	0.091	0.031	0.3135	0.0342	0.0000	4.26E-08
244	0.00	0.000	0.020	0.3115	0.0342	0.0000	4.25E-08
245	0.00	0.000	0.020	0.3096	0.0341	0.0000	4.25E-08
246	0.00	0.000	0.021	0.3075	0.0341	0.0000	4.25E-08
247	0.43	0.257	0.043	0.3202	0.0341	0.0000	4.25E-08
248	1.30	1.067	0.125	0.3312	0.0341	0.0000	4.25E-08

249		0.00	0.000	0.081	0.3231	0.0341	0.0000	4.25E-08
250		0.00	0.000	0.077	0.3154	0.0341	0.0000	4.25E-08
251		0.00	0.000	0.210	0.2944	0.0341	0.0000	4.25E-08
252		0.00	0.000	0.150	0.2794	0.0341	0.0000	4.25E-08
253		0.00	0.000	0.018	0.2776	0.0341	0.0000	4.25E-08
254		0.00	0.000	0.006	0.2770	0.0341	0.0000	4.25E-08
255		0.00	0.000	0.000	0.2770	0.0341	0.0000	4.25E-08
256		0.00	0.000	0.000	0.2770	0.0341	0.0000	4.25E-08
257		0.00	0.000	0.000	0.2770	0.0340	0.0000	4.24E-08
258		0.00	0.000	0.000	0.2770	0.0340	0.0000	4.24E-08
259		0.00	0.000	0.000	0.2770	0.0340	0.0000	4.24E-08
260		0.00	0.000	0.000	0.2770	0.0340	0.0000	4.24E-08
261		0.00	0.000	0.000	0.2770	0.0340	0.0000	4.24E-08
262		0.00	0.000	0.004	0.2770	0.0340	0.0000	4.24E-08
263		1.00	0.800	0.036	0.2932	0.0340	0.0000	4.24E-08
264		0.00	0.000	0.011	0.2921	0.0340	0.0000	4.24E-08
265		0.00	0.000	0.017	0.2904	0.0340	0.0000	4.24E-08
266		0.00	0.000	0.015	0.2890	0.0340	0.0000	4.24E-08
267		0.00	0.000	0.013	0.2877	0.0340	0.0000	4.24E-08
268		0.01	0.000	0.019	0.2868	0.0339	0.0000	4.23E-08
269		0.23	0.072	0.026	0.2994	0.0339	0.0000	4.23E-08
270		0.06	0.000	0.075	0.2978	0.0339	0.0000	4.23E-08
271		0.03	0.000	0.026	0.2985	0.0339	0.0000	4.23E-08
272	*	0.00	0.000	0.013	0.2972	0.0339	0.0000	4.23E-08
273		0.00	0.000	0.012	0.2961	0.0339	0.0000	4.24E-08
274		0.00	0.000	0.010	0.2950	0.0340	0.0000	4.24E-08
275		0.00	0.000	0.010	0.2940	0.0340	0.0000	4.24E-08
276		0.00	0.000	0.010	0.2930	0.0340	0.0000	4.24E-08
277		0.00	0.000	0.010	0.2921	0.0340	0.0000	4.24E-08
278		0.00	0.000	0.010	0.2911	0.0340	0.0000	4.24E-08
279		0.00	0.000	0.009	0.2901	0.0340	0.0000	4.24E-08
280		0.00	0.000	0.009	0.2893	0.0340	0.0000	4.24E-08

281		0.20	0.052	0.024	0.3013	0.0340	0.0000	4.24E-08
282		0.00	0.000	0.109	0.2904	0.0340	0.0000	4.24E-08
283		0.00	0.000	0.009	0.2895	0.0340	0.0000	4.24E-08
284		0.00	0.000	0.009	0.2886	0.0340	0.0000	4.24E-08
285		0.00	0.000	0.008	0.2878	0.0340	0.0000	4.24E-08
286		0.00	0.000	0.008	0.2870	0.0340	0.0000	4.24E-08
287		0.00	0.000	0.008	0.2862	0.0340	0.0000	4.24E-08
288		0.00	0.000	0.008	0.2854	0.0340	0.0000	4.24E-08
289	*	0.00	0.000	0.008	0.2847	0.0340	0.0000	4.24E-08
290		0.00	0.000	0.007	0.2839	0.0340	0.0000	4.24E-08
291		0.00	0.000	0.007	0.2832	0.0339	0.0000	4.24E-08
292		0.00	0.000	0.007	0.2825	0.0339	0.0000	4.23E-08
293		0.00	0.000	0.007	0.2818	0.0339	0.0000	4.23E-08
294		0.00	0.000	0.009	0.2809	0.0339	0.0000	4.23E-08
295		0.00	0.000	0.009	0.2801	0.0339	0.0000	4.23E-08
296		0.02	0.000	0.019	0.2799	0.0339	0.0000	4.23E-08
297		0.49	0.311	0.025	0.2955	0.0339	0.0000	4.23E-08
298		0.00	0.000	0.061	0.2894	0.0339	0.0000	4.23E-08
299		0.00	0.000	0.009	0.2885	0.0339	0.0000	4.23E-08
300	*	0.06	0.000	0.046	0.2904	0.0339	0.0000	4.23E-08
301		0.50	0.347	0.025	0.3033	0.0338	0.0000	4.23E-08
302		0.00	0.000	0.043	0.2990	0.0338	0.0000	4.23E-08
303	*	0.00	0.000	0.000	0.2990	0.0338	0.0000	4.22E-08
304	*	0.00	0.000	0.000	0.2990	0.0338	0.0000	4.22E-08
305	*	0.00	0.000	0.000	0.2990	0.0338	0.0000	4.22E-08
306	*	0.00	0.000	0.000	0.2990	0.0338	0.0000	4.22E-08
307	*	0.00	0.000	0.035	0.2955	0.0338	0.0000	4.22E-08
308		0.00	0.000	0.038	0.2917	0.0338	0.0000	4.22E-08
309		0.00	0.000	0.047	0.2871	0.0338	0.0000	4.22E-08
310		0.00	0.000	0.079	0.2792	0.0338	0.0000	4.22E-08
311		0.00	0.000	0.013	0.2779	0.0338	0.0000	4.22E-08
312		0.00	0.000	0.004	0.2774	0.0337	0.0000	4.22E-08

313		0.02	0.000	0.017	0.2775	0.0337	0.0000	4.22E-08
314		0.00	0.000	0.003	0.2771	0.0337	0.0000	4.21E-08
315		0.15	0.003	0.028	0.2895	0.0337	0.0000	4.21E-08
316		0.11	0.000	0.026	0.2978	0.0337	0.0000	4.21E-08
317	*	0.26	0.000	0.036	0.2998	0.0337	0.0000	4.21E-08
318	*	0.02	0.000	0.019	0.3018	0.0337	0.0000	4.21E-08
319	*	0.00	0.000	0.029	0.3037	0.0337	0.0000	4.21E-08
320		0.00	0.000	0.060	0.3057	0.0337	0.0000	4.21E-08
321	*	0.00	0.000	0.032	0.3077	0.0337	0.0000	4.21E-08
322	*	0.00	0.000	0.009	0.3077	0.0336	0.0000	4.21E-08
323	*	0.02	0.000	0.018	0.3077	0.0336	0.0000	4.21E-08
324		0.00	0.000	0.017	0.3060	0.0336	0.0000	4.20E-08
325		0.00	0.000	0.016	0.3044	0.0336	0.0000	4.20E-08
326		0.00	0.000	0.015	0.3029	0.0336	0.0000	4.20E-08
327		0.00	0.000	0.014	0.3015	0.0336	0.0000	4.20E-08
328	*	0.00	0.000	0.013	0.3001	0.0336	0.0000	4.20E-08
329	*	0.00	0.000	0.013	0.2988	0.0336	0.0000	4.20E-08
330		0.91	0.733	0.032	0.3137	0.0336	0.0000	4.20E-08
331		0.00	0.000	0.064	0.3073	0.0336	0.0000	4.20E-08
332		0.00	0.000	0.045	0.3029	0.0335	0.0000	4.20E-08
333	*	0.00	0.000	0.000	0.3029	0.0335	0.0000	4.20E-08
334		0.00	0.000	0.041	0.2988	0.0335	0.0000	4.20E-08
335	*	0.00	0.000	0.000	0.2988	0.0335	0.0000	4.19E-08
336	*	0.00	0.000	0.034	0.2954	0.0335	0.0000	4.19E-08
337		0.00	0.000	0.067	0.2887	0.0335	0.0000	4.19E-08
338		0.00	0.000	0.080	0.2808	0.0335	0.0000	4.19E-08
339		0.00	0.000	0.029	0.2779	0.0335	0.0000	4.19E-08
340		0.06	0.000	0.024	0.2819	0.0335	0.0000	4.19E-08
341		0.00	0.000	0.016	0.2802	0.0335	0.0000	4.19E-08
342		0.00	0.000	0.013	0.2789	0.0334	0.0000	4.19E-08
343		0.00	0.000	0.005	0.2784	0.0334	0.0000	4.19E-08
344		0.00	0.000	0.005	0.2779	0.0334	0.0000	4.19E-08

345		0.00	0.000	0.004	0.2774	0.0334	0.0000	4.19E-08
346	*	0.01	0.000	0.014	0.2774	0.0334	0.0000	4.19E-08
347	*	0.66	0.000	0.032	0.2794	0.0334	0.0000	4.18E-08
348		0.01	0.000	0.000	0.2905	0.0334	0.0000	4.18E-08
349		0.00	0.364	0.014	0.3029	0.0334	0.0000	4.18E-08
350	*	0.25	0.000	0.032	0.3049	0.0334	0.0000	4.18E-08
351		0.67	0.739	0.000	0.3176	0.0334	0.0000	4.18E-08
352		0.00	0.000	0.052	0.3124	0.0334	0.0000	4.18E-08
353		0.00	0.000	0.029	0.3095	0.0334	0.0000	4.18E-08
354	*	0.00	0.000	0.000	0.3095	0.0333	0.0000	4.18E-08
355		0.00	0.000	0.036	0.3060	0.0333	0.0000	4.18E-08
356	*	0.00	0.000	0.031	0.3029	0.0333	0.0000	4.18E-08
357		0.00	0.000	0.040	0.2988	0.0333	0.0000	4.18E-08
358		0.00	0.000	0.035	0.2954	0.0333	0.0000	4.17E-08
359		0.00	0.000	0.043	0.2911	0.0333	0.0000	4.17E-08
360		0.00	0.000	0.054	0.2857	0.0333	0.0000	4.17E-08
361		0.00	0.000	0.046	0.2811	0.0333	0.0000	4.17E-08
362		0.00	0.000	0.036	0.2775	0.0333	0.0000	4.17E-08
363		0.05	0.000	0.024	0.2805	0.0333	0.0000	4.17E-08
364		0.00	0.000	0.007	0.2798	0.0332	0.0000	4.17E-08
365		0.00	0.000	0.015	0.2783	0.0332	0.0000	4.17E-08

* = Frozen (air or soil)

Annual Totals for Year 4			
	inches	cubic feet	percent
Precipitation	39.57	143,629.9	100.00
Runoff	26.248	95,280.0	66.34
Evapotranspiration	13.521	49,079.9	34.17
Recirculation into Layer 1	0.0013	4.7151	0.00
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0013	4.7151	0.00
Percolation/Leakage through Layer 5	0.000015	0.0529	0.00
Average Head on Top of Layer 4	0.0313	---	---
Change in Water Storage	-0.2011	-730.0	-0.51
Soil Water at Start of Year	1,406.6893	5,106,282.0	3555.17
Soil Water at End of Year	1,406.4882	5,105,552.0	3554.66
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0013	-4.7120	0.00

Daily Output for Year 5

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.007	0.2776	0.0332	0.0000	4.17E-08
2			0.00	0.000	0.005	0.2772	0.0332	0.0000	4.17E-08
3			0.03	0.000	0.016	0.2790	0.0332	0.0000	4.16E-08
4			0.00	0.000	0.003	0.2787	0.0332	0.0000	4.16E-08
5	*		0.00	0.000	0.005	0.2782	0.0332	0.0000	4.16E-08
6			0.00	0.000	0.004	0.2778	0.0332	0.0000	4.16E-08
7			0.00	0.000	0.004	0.2774	0.0332	0.0000	4.16E-08
8			0.00	0.000	0.003	0.2771	0.0332	0.0000	4.16E-08
9			0.00	0.000	0.001	0.2770	0.0331	0.0000	4.16E-08
10			0.00	0.000	0.000	0.2770	0.0331	0.0000	4.16E-08
11			0.03	0.000	0.014	0.2790	0.0331	0.0000	4.16E-08
12			0.00	0.000	0.001	0.2789	0.0331	0.0000	4.16E-08
13			0.00	0.000	0.003	0.2785	0.0331	0.0000	4.16E-08
14			0.00	0.000	0.003	0.2783	0.0331	0.0000	4.16E-08
15			0.00	0.000	0.003	0.2780	0.0331	0.0000	4.15E-08
16			0.00	0.000	0.003	0.2777	0.0331	0.0000	4.15E-08
17			0.00	0.000	0.003	0.2774	0.0331	0.0000	4.15E-08
18			0.00	0.000	0.003	0.2772	0.0331	0.0000	4.15E-08
19			0.00	0.000	0.001	0.2770	0.0331	0.0000	4.15E-08
20	*		0.00	0.000	0.000	0.2770	0.0330	0.0000	4.15E-08
21			0.00	0.000	0.000	0.2770	0.0330	0.0000	4.15E-08
22			0.00	0.000	0.000	0.2770	0.0330	0.0000	4.15E-08
23			0.00	0.000	0.000	0.2770	0.0330	0.0000	4.15E-08
24	*		0.00	0.000	0.000	0.2770	0.0330	0.0000	4.15E-08

25		0.00	0.000	0.000	0.2770	0.0330	0.0000	4.15E-08
26		0.00	0.000	0.000	0.2770	0.0330	0.0000	4.14E-08
27	*	0.00	0.000	0.000	0.2770	0.0330	0.0000	4.14E-08
28	*	0.16	0.000	0.023	0.2790	0.0330	0.0000	4.14E-08
29		0.00	0.000	0.075	0.2828	0.0330	0.0000	4.14E-08
30		0.00	0.000	0.006	0.2823	0.0329	0.0000	4.14E-08
31		0.01	0.000	0.011	0.2820	0.0329	0.0000	4.14E-08
32		0.00	0.000	0.007	0.2812	0.0329	0.0000	4.14E-08
33		0.00	0.000	0.006	0.2806	0.0329	0.0000	4.14E-08
34	*	0.00	0.000	0.007	0.2798	0.0329	0.0000	4.14E-08
35	*	0.00	0.000	0.007	0.2791	0.0329	0.0000	4.14E-08
36		0.00	0.000	0.007	0.2784	0.0329	0.0000	4.14E-08
37		0.00	0.000	0.003	0.2782	0.0329	0.0000	4.14E-08
38		0.20	0.057	0.019	0.2903	0.0329	0.0000	4.13E-08
39	*	0.00	0.000	0.005	0.2898	0.0329	0.0000	4.13E-08
40		0.00	0.000	0.007	0.2891	0.0329	0.0000	4.13E-08
41		0.00	0.000	0.007	0.2884	0.0329	0.0000	4.13E-08
42		0.00	0.000	0.007	0.2877	0.0328	0.0000	4.13E-08
43		0.00	0.000	0.007	0.2870	0.0328	0.0000	4.13E-08
44		0.00	0.000	0.007	0.2863	0.0328	0.0000	4.13E-08
45		0.00	0.000	0.007	0.2857	0.0328	0.0000	4.13E-08
46		0.00	0.000	0.007	0.2850	0.0328	0.0000	4.13E-08
47		0.00	0.000	0.007	0.2843	0.0328	0.0000	4.13E-08
48		0.00	0.000	0.006	0.2837	0.0328	0.0000	4.13E-08
49		0.07	0.000	0.020	0.2884	0.0328	0.0000	4.13E-08
50		0.00	0.000	0.007	0.2877	0.0328	0.0000	4.12E-08
51		0.00	0.000	0.008	0.2869	0.0328	0.0000	4.12E-08
52		0.00	0.000	0.008	0.2862	0.0328	0.0000	4.12E-08
53		0.00	0.000	0.008	0.2854	0.0327	0.0000	4.12E-08
54		0.00	0.000	0.006	0.2848	0.0327	0.0000	4.12E-08
55		0.00	0.000	0.006	0.2842	0.0327	0.0000	4.12E-08
56		0.00	0.000	0.006	0.2836	0.0327	0.0000	4.12E-08

57		0.57	0.399	0.022	0.2987	0.0327	0.0000	4.12E-08
58		0.00	0.000	0.006	0.2981	0.0327	0.0000	4.12E-08
59		0.25	0.096	0.020	0.3114	0.0327	0.0000	4.12E-08
60		0.07	0.000	0.071	0.3114	0.0327	0.0000	4.12E-08
61		0.00	0.000	0.007	0.3107	0.0327	0.0000	4.11E-08
62		0.00	0.000	0.008	0.3099	0.0327	0.0000	4.11E-08
63		0.01	0.000	0.014	0.3094	0.0326	0.0000	4.11E-08
64		0.00	0.000	0.006	0.3089	0.0326	0.0000	4.11E-08
65		0.00	0.000	0.006	0.3083	0.0326	0.0000	4.11E-08
66		0.00	0.000	0.006	0.3077	0.0326	0.0000	4.11E-08
67		0.00	0.000	0.007	0.3071	0.0326	0.0000	4.11E-08
68		0.00	0.000	0.007	0.3064	0.0326	0.0000	4.11E-08
69	*	0.00	0.000	0.007	0.3057	0.0326	0.0000	4.11E-08
70		0.15	0.012	0.020	0.3176	0.0326	0.0000	4.11E-08
71		0.00	0.000	0.080	0.3096	0.0326	0.0000	4.11E-08
72		0.00	0.000	0.007	0.3089	0.0326	0.0000	4.11E-08
73		0.00	0.000	0.008	0.3082	0.0326	0.0000	4.10E-08
74		0.00	0.000	0.007	0.3075	0.0325	0.0000	4.10E-08
75		0.00	0.000	0.006	0.3068	0.0325	0.0000	4.10E-08
76		0.00	0.000	0.006	0.3062	0.0325	0.0000	4.10E-08
77		0.00	0.000	0.006	0.3056	0.0325	0.0000	4.10E-08
78		0.00	0.000	0.006	0.3049	0.0325	0.0000	4.10E-08
79		0.00	0.000	0.006	0.3043	0.0325	0.0000	4.10E-08
80		0.00	0.000	0.006	0.3037	0.0325	0.0000	4.10E-08
81		0.00	0.000	0.006	0.3030	0.0325	0.0000	4.10E-08
82		0.00	0.000	0.006	0.3024	0.0325	0.0000	4.10E-08
83		0.07	0.000	0.020	0.3074	0.0325	0.0000	4.10E-08
84		0.01	0.000	0.011	0.3069	0.0325	0.0000	4.09E-08
85		1.07	0.916	0.022	0.3204	0.0324	0.0000	4.09E-08
86		0.60	0.354	0.151	0.3300	0.0324	0.0000	4.09E-08
87		0.00	0.000	0.281	0.3019	0.0324	0.0000	4.09E-08
88		0.00	0.000	0.173	0.2846	0.0324	0.0000	4.09E-08

89		0.00	0.000	0.068	0.2778	0.0324	0.0000	4.09E-08
90		0.00	0.000	0.004	0.2774	0.0324	0.0000	4.09E-08
91		0.00	0.000	0.004	0.2770	0.0324	0.0000	4.09E-08
92		0.00	0.000	0.000	0.2770	0.0324	0.0000	4.09E-08
93		0.41	0.222	0.045	0.2914	0.0324	0.0000	4.09E-08
94		0.54	0.256	0.165	0.3030	0.0324	0.0000	4.09E-08
95		0.13	0.003	0.057	0.3105	0.0324	0.0000	4.09E-08
96		0.00	0.000	0.134	0.2971	0.0324	0.0000	4.09E-08
97		0.32	0.106	0.138	0.3050	0.0324	0.0000	4.09E-08
98	*	0.16	0.000	0.053	0.3069	0.0324	0.0000	4.09E-08
99		0.00	0.000	0.122	0.3031	0.0323	0.0000	4.08E-08
100		0.00	0.000	0.148	0.2883	0.0323	0.0000	4.08E-08
101		0.00	0.000	0.083	0.2800	0.0323	0.0000	4.08E-08
102		0.09	0.000	0.041	0.2846	0.0323	0.0000	4.08E-08
103		0.34	0.158	0.057	0.2973	0.0323	0.0000	4.08E-08
104		0.00	0.000	0.082	0.2892	0.0323	0.0000	4.08E-08
105		0.00	0.000	0.025	0.2866	0.0324	0.0000	4.09E-08
106		0.00	0.000	0.023	0.2844	0.0324	0.0000	4.09E-08
107		0.00	0.000	0.020	0.2825	0.0324	0.0000	4.09E-08
108		0.01	0.000	0.021	0.2809	0.0324	0.0000	4.09E-08
109		0.00	0.000	0.020	0.2789	0.0324	0.0000	4.09E-08
110		0.00	0.000	0.010	0.2779	0.0324	0.0000	4.09E-08
111		0.13	0.000	0.023	0.2882	0.0324	0.0000	4.09E-08
112		0.01	0.000	0.019	0.2875	0.0323	0.0000	4.08E-08
113		0.01	0.000	0.015	0.2866	0.0325	0.0000	4.10E-08
114		0.00	0.000	0.012	0.2854	0.0327	0.0000	4.12E-08
115		0.09	0.000	0.027	0.2920	0.0327	0.0000	4.11E-08
116		1.11	0.948	0.033	0.3053	0.0327	0.0000	4.11E-08
117		0.00	0.000	0.087	0.2966	0.0327	0.0000	4.11E-08
118		0.01	0.000	0.124	0.2856	0.0326	0.0000	4.11E-08
119		0.00	0.000	0.064	0.2792	0.0326	0.0000	4.11E-08
120		0.00	0.000	0.016	0.2775	0.0326	0.0000	4.11E-08

121	0.00	0.000	0.004	0.2771	0.0326	0.0000	4.11E-08
122	0.00	0.000	0.001	0.2770	0.0326	0.0000	4.11E-08
123	0.29	0.127	0.045	0.2891	0.0326	0.0000	4.11E-08
124	0.00	0.000	0.015	0.2877	0.0326	0.0000	4.11E-08
125	0.00	0.000	0.021	0.2856	0.0326	0.0000	4.11E-08
126	0.08	0.000	0.034	0.2899	0.0326	0.0000	4.11E-08
127	0.00	0.000	0.022	0.2879	0.0326	0.0000	4.10E-08
128	0.00	0.000	0.014	0.2865	0.0326	0.0000	4.10E-08
129	0.08	0.000	0.032	0.2910	0.0325	0.0000	4.10E-08
130	0.00	0.000	0.013	0.2898	0.0325	0.0000	4.10E-08
131	0.00	0.000	0.015	0.2883	0.0325	0.0000	4.10E-08
132	0.00	0.000	0.015	0.2868	0.0325	0.0000	4.10E-08
133	0.00	0.000	0.015	0.2853	0.0325	0.0000	4.10E-08
134	0.00	0.000	0.016	0.2837	0.0325	0.0000	4.10E-08
135	0.04	0.000	0.028	0.2846	0.0325	0.0000	4.10E-08
136	0.38	0.221	0.034	0.2975	0.0325	0.0000	4.10E-08
137	0.00	0.000	0.115	0.2859	0.0325	0.0000	4.10E-08
138	0.00	0.000	0.015	0.2845	0.0325	0.0000	4.09E-08
139	0.00	0.000	0.014	0.2830	0.0324	0.0000	4.09E-08
140	0.00	0.000	0.017	0.2814	0.0324	0.0000	4.09E-08
141	0.00	0.000	0.014	0.2800	0.0324	0.0000	4.09E-08
142	0.00	0.000	0.014	0.2785	0.0324	0.0000	4.09E-08
143	0.00	0.000	0.010	0.2775	0.0324	0.0000	4.09E-08
144	0.14	0.000	0.025	0.2893	0.0324	0.0000	4.09E-08
145	0.23	0.087	0.031	0.3010	0.0324	0.0000	4.09E-08
146	0.12	0.001	0.118	0.3012	0.0324	0.0000	4.09E-08
147	0.39	0.228	0.034	0.3139	0.0324	0.0000	4.09E-08
148	0.00	0.000	0.137	0.3002	0.0324	0.0000	4.09E-08
149	0.16	0.018	0.029	0.3114	0.0324	0.0000	4.08E-08
150	0.00	0.000	0.193	0.2921	0.0323	0.0000	4.08E-08
151	0.21	0.064	0.039	0.3032	0.0323	0.0000	4.08E-08
152	0.00	0.000	0.022	0.3011	0.0323	0.0000	4.08E-08

153	0.15	0.003	0.035	0.3125	0.0324	0.0000	4.09E-08
154	0.00	0.000	0.192	0.2934	0.0325	0.0000	4.10E-08
155	0.08	0.000	0.034	0.2979	0.0325	0.0000	4.10E-08
156	0.00	0.000	0.020	0.2959	0.0326	0.0000	4.11E-08
157	0.03	0.000	0.031	0.2963	0.0326	0.0000	4.11E-08
158	0.43	0.274	0.034	0.3083	0.0326	0.0000	4.11E-08
159	0.19	0.028	0.252	0.2998	0.0326	0.0000	4.11E-08
160	0.04	0.000	0.035	0.2999	0.0326	0.0000	4.11E-08
161	1.98	1.545	0.320	0.3113	0.0326	0.0000	4.10E-08
162	0.19	0.033	0.195	0.3071	0.0326	0.0000	4.11E-08
163	0.27	0.102	0.197	0.3045	0.0326	0.0000	4.10E-08
164	0.00	0.000	0.166	0.2879	0.0328	0.0000	4.13E-08
165	0.00	0.000	0.092	0.2787	0.0330	0.0000	4.15E-08
166	0.00	0.000	0.009	0.2778	0.0330	0.0000	4.15E-08
167	0.00	0.000	0.006	0.2772	0.0330	0.0000	4.15E-08
168	0.21	0.054	0.039	0.2887	0.0330	0.0000	4.15E-08
169	0.05	0.000	0.032	0.2906	0.0330	0.0000	4.15E-08
170	0.45	0.269	0.050	0.3033	0.0330	0.0000	4.14E-08
171	0.00	0.000	0.121	0.2912	0.0330	0.0000	4.14E-08
172	0.88	0.690	0.047	0.3056	0.0330	0.0000	4.14E-08
173	0.17	0.031	0.104	0.3095	0.0330	0.0000	4.14E-08
174	0.00	0.000	0.187	0.2909	0.0330	0.0000	4.14E-08
175	0.00	0.000	0.089	0.2820	0.0329	0.0000	4.14E-08
176	0.00	0.000	0.025	0.2795	0.0330	0.0000	4.14E-08
177	0.00	0.000	0.018	0.2776	0.0332	0.0000	4.16E-08
178	0.03	0.000	0.023	0.2786	0.0332	0.0000	4.17E-08
179	0.20	0.051	0.041	0.2895	0.0332	0.0000	4.17E-08
180	0.00	0.000	0.025	0.2875	0.0332	0.0000	4.16E-08
181	0.00	0.000	0.030	0.2845	0.0332	0.0000	4.16E-08
182	0.00	0.000	0.032	0.2813	0.0332	0.0000	4.16E-08
183	0.15	0.002	0.039	0.2922	0.0332	0.0000	4.16E-08
184	0.00	0.000	0.026	0.2895	0.0332	0.0000	4.16E-08

185	0.00	0.000	0.031	0.2864	0.0331	0.0000	4.16E-08
186	0.00	0.000	0.032	0.2832	0.0331	0.0000	4.16E-08
187	0.00	0.000	0.027	0.2805	0.0331	0.0000	4.16E-08
188	0.00	0.000	0.021	0.2785	0.0331	0.0000	4.16E-08
189	0.00	0.000	0.010	0.2775	0.0331	0.0000	4.16E-08
190	0.00	0.000	0.004	0.2771	0.0331	0.0000	4.16E-08
191	0.00	0.000	0.001	0.2770	0.0331	0.0000	4.15E-08
192	0.00	0.000	0.000	0.2770	0.0331	0.0000	4.15E-08
193	0.00	0.000	0.000	0.2770	0.0331	0.0000	4.15E-08
194	0.27	0.119	0.032	0.2892	0.0331	0.0000	4.15E-08
195	0.00	0.000	0.015	0.2876	0.0331	0.0000	4.15E-08
196	0.00	0.000	0.020	0.2857	0.0330	0.0000	4.15E-08
197	0.00	0.000	0.028	0.2828	0.0330	0.0000	4.15E-08
198	0.00	0.000	0.027	0.2801	0.0330	0.0000	4.15E-08
199	0.00	0.000	0.026	0.2776	0.0330	0.0000	4.15E-08
200	0.00	0.000	0.003	0.2773	0.0330	0.0000	4.15E-08
201	0.00	0.000	0.001	0.2771	0.0330	0.0000	4.15E-08
202	0.31	0.148	0.044	0.2893	0.0330	0.0000	4.14E-08
203	0.00	0.000	0.014	0.2879	0.0330	0.0000	4.14E-08
204	0.02	0.000	0.037	0.2863	0.0330	0.0000	4.14E-08
205	0.00	0.000	0.025	0.2837	0.0330	0.0000	4.14E-08
206	0.00	0.000	0.023	0.2815	0.0330	0.0000	4.14E-08
207	0.00	0.000	0.023	0.2792	0.0329	0.0000	4.14E-08
208	0.00	0.000	0.018	0.2774	0.0329	0.0000	4.14E-08
209	0.00	0.000	0.002	0.2772	0.0329	0.0000	4.14E-08
210	0.10	0.000	0.023	0.2850	0.0329	0.0000	4.14E-08
211	0.39	0.227	0.046	0.2964	0.0329	0.0000	4.14E-08
212	0.26	0.078	0.169	0.2976	0.0329	0.0000	4.14E-08
213	0.00	0.000	0.081	0.2895	0.0329	0.0000	4.13E-08
214	0.00	0.000	0.066	0.2829	0.0329	0.0000	4.13E-08
215	0.00	0.000	0.035	0.2793	0.0329	0.0000	4.13E-08
216	0.00	0.000	0.018	0.2776	0.0329	0.0000	4.13E-08

217	0.00	0.000	0.004	0.2772	0.0328	0.0000	4.13E-08
218	0.00	0.000	0.001	0.2770	0.0328	0.0000	4.13E-08
219	0.00	0.000	0.000	0.2770	0.0328	0.0000	4.13E-08
220	0.00	0.000	0.000	0.2770	0.0328	0.0000	4.13E-08
221	0.00	0.000	0.000	0.2770	0.0328	0.0000	4.13E-08
222	0.18	0.025	0.041	0.2886	0.0328	0.0000	4.13E-08
223	0.00	0.000	0.016	0.2869	0.0328	0.0000	4.13E-08
224	0.00	0.000	0.032	0.2837	0.0328	0.0000	4.12E-08
225	0.00	0.000	0.043	0.2795	0.0328	0.0000	4.12E-08
226	0.01	0.000	0.027	0.2776	0.0328	0.0000	4.12E-08
227	0.00	0.000	0.004	0.2771	0.0328	0.0000	4.12E-08
228	0.00	0.000	0.001	0.2770	0.0327	0.0000	4.12E-08
229	0.43	0.244	0.045	0.2911	0.0327	0.0000	4.12E-08
230	0.00	0.000	0.023	0.2888	0.0327	0.0000	4.12E-08
231	0.00	0.000	0.038	0.2850	0.0327	0.0000	4.12E-08
232	0.00	0.000	0.041	0.2810	0.0327	0.0000	4.12E-08
233	0.07	0.000	0.053	0.2826	0.0327	0.0000	4.12E-08
234	0.11	0.000	0.048	0.2887	0.0327	0.0000	4.12E-08
235	0.05	0.000	0.099	0.2839	0.0327	0.0000	4.12E-08
236	0.00	0.000	0.028	0.2811	0.0327	0.0000	4.11E-08
237	0.00	0.000	0.022	0.2789	0.0327	0.0000	4.11E-08
238	0.00	0.000	0.010	0.2779	0.0326	0.0000	4.11E-08
239	0.00	0.000	0.007	0.2772	0.0327	0.0000	4.11E-08
240	0.00	0.000	0.001	0.2771	0.0327	0.0000	4.12E-08
241	0.00	0.000	0.000	0.2770	0.0327	0.0000	4.12E-08
242	0.02	0.000	0.015	0.2772	0.0327	0.0000	4.12E-08
243	0.00	0.000	0.001	0.2771	0.0327	0.0000	4.12E-08
244	0.00	0.000	0.001	0.2770	0.0327	0.0000	4.12E-08
245	0.00	0.000	0.000	0.2770	0.0327	0.0000	4.12E-08
246	0.00	0.000	0.000	0.2770	0.0327	0.0000	4.11E-08
247	0.00	0.000	0.000	0.2770	0.0327	0.0000	4.11E-08
248	0.00	0.000	0.000	0.2770	0.0326	0.0000	4.11E-08

249	0.03	0.000	0.017	0.2780	0.0326	0.0000	4.11E-08
250	0.30	0.130	0.039	0.2914	0.0326	0.0000	4.11E-08
251	0.00	0.000	0.023	0.2891	0.0326	0.0000	4.11E-08
252	0.01	0.000	0.027	0.2874	0.0326	0.0000	4.11E-08
253	0.47	0.295	0.042	0.3010	0.0326	0.0000	4.11E-08
254	0.22	0.058	0.137	0.3030	0.0326	0.0000	4.11E-08
255	0.00	0.000	0.133	0.2897	0.0326	0.0000	4.11E-08
256	0.00	0.000	0.096	0.2801	0.0326	0.0000	4.11E-08
257	0.00	0.000	0.024	0.2778	0.0326	0.0000	4.10E-08
258	0.00	0.000	0.006	0.2772	0.0326	0.0000	4.10E-08
259	0.00	0.000	0.001	0.2771	0.0325	0.0000	4.10E-08
260	0.00	0.000	0.001	0.2770	0.0325	0.0000	4.10E-08
261	0.00	0.000	0.000	0.2770	0.0325	0.0000	4.10E-08
262	0.00	0.000	0.000	0.2770	0.0325	0.0000	4.10E-08
263	0.00	0.000	0.000	0.2770	0.0325	0.0000	4.10E-08
264	0.00	0.000	0.000	0.2770	0.0325	0.0000	4.10E-08
265	0.08	0.000	0.022	0.2825	0.0325	0.0000	4.10E-08
266	0.00	0.000	0.016	0.2809	0.0325	0.0000	4.10E-08
267	0.00	0.000	0.020	0.2789	0.0325	0.0000	4.10E-08
268	0.01	0.000	0.014	0.2782	0.0325	0.0000	4.10E-08
269	0.27	0.110	0.036	0.2910	0.0325	0.0000	4.09E-08
270	0.00	0.000	0.012	0.2898	0.0324	0.0000	4.09E-08
271	0.00	0.000	0.022	0.2876	0.0324	0.0000	4.09E-08
272	0.00	0.000	0.021	0.2855	0.0324	0.0000	4.09E-08
273	0.00	0.000	0.018	0.2837	0.0324	0.0000	4.09E-08
274	0.21	0.065	0.041	0.2943	0.0324	0.0000	4.09E-08
275	0.45	0.299	0.047	0.3047	0.0324	0.0000	4.09E-08
276	0.00	0.000	0.100	0.2948	0.0324	0.0000	4.09E-08
277	0.07	0.000	0.035	0.2979	0.0324	0.0000	4.09E-08
278	0.07	0.000	0.036	0.3012	0.0324	0.0000	4.09E-08
279	0.15	0.001	0.093	0.3067	0.0324	0.0000	4.09E-08
280	0.00	0.000	0.104	0.2963	0.0323	0.0000	4.08E-08

281		0.00	0.000	0.067	0.2896	0.0324	0.0000	4.09E-08
282	*	0.00	0.000	0.035	0.2861	0.0325	0.0000	4.10E-08
283	*	0.00	0.000	0.000	0.2861	0.0325	0.0000	4.10E-08
284	*	0.00	0.000	0.027	0.2834	0.0325	0.0000	4.10E-08
285		0.00	0.000	0.028	0.2806	0.0325	0.0000	4.09E-08
286		0.00	0.000	0.023	0.2783	0.0324	0.0000	4.09E-08
287		0.00	0.000	0.010	0.2773	0.0324	0.0000	4.09E-08
288		0.00	0.000	0.002	0.2771	0.0324	0.0000	4.09E-08
289		0.00	0.000	0.001	0.2770	0.0324	0.0000	4.09E-08
290		0.00	0.000	0.000	0.2770	0.0324	0.0000	4.09E-08
291		0.56	0.354	0.042	0.2931	0.0324	0.0000	4.09E-08
292		0.01	0.000	0.019	0.2925	0.0324	0.0000	4.09E-08
293		0.00	0.000	0.015	0.2910	0.0324	0.0000	4.09E-08
294		0.00	0.000	0.014	0.2896	0.0324	0.0000	4.09E-08
295		0.00	0.000	0.013	0.2882	0.0324	0.0000	4.09E-08
296		0.32	0.141	0.039	0.3027	0.0324	0.0000	4.08E-08
297		0.00	0.000	0.047	0.2980	0.0323	0.0000	4.08E-08
298		0.00	0.000	0.075	0.2905	0.0323	0.0000	4.08E-08
299		0.00	0.000	0.087	0.2818	0.0323	0.0000	4.08E-08
300		0.02	0.000	0.055	0.2782	0.0323	0.0000	4.08E-08
301		0.04	0.000	0.028	0.2793	0.0323	0.0000	4.08E-08
302		0.00	0.000	0.004	0.2789	0.0323	0.0000	4.08E-08
303		0.00	0.000	0.006	0.2783	0.0323	0.0000	4.08E-08
304		0.00	0.000	0.005	0.2778	0.0323	0.0000	4.08E-08
305		0.00	0.000	0.005	0.2773	0.0323	0.0000	4.08E-08
306		0.00	0.000	0.002	0.2771	0.0323	0.0000	4.08E-08
307		0.10	0.000	0.022	0.2848	0.0322	0.0000	4.07E-08
308		0.04	0.000	0.027	0.2866	0.0322	0.0000	4.07E-08
309		0.09	0.000	0.028	0.2927	0.0322	0.0000	4.07E-08
310		0.03	0.000	0.024	0.2933	0.0322	0.0000	4.07E-08
311		0.11	0.000	0.028	0.3017	0.0322	0.0000	4.07E-08
312		0.00	0.000	0.011	0.3006	0.0322	0.0000	4.07E-08

313		0.00	0.000	0.011	0.2994	0.0322	0.0000	4.07E-08
314		0.00	0.000	0.011	0.2983	0.0322	0.0000	4.07E-08
315		0.00	0.000	0.011	0.2972	0.0322	0.0000	4.07E-08
316		0.00	0.000	0.010	0.2962	0.0322	0.0000	4.07E-08
317		0.00	0.000	0.010	0.2952	0.0322	0.0000	4.07E-08
318		0.00	0.000	0.010	0.2942	0.0322	0.0000	4.07E-08
319		0.00	0.000	0.010	0.2932	0.0321	0.0000	4.06E-08
320	*	0.00	0.000	0.000	0.2932	0.0321	0.0000	4.06E-08
321		0.60	0.421	0.032	0.3078	0.0321	0.0000	4.06E-08
322		0.00	0.000	0.056	0.3022	0.0321	0.0000	4.06E-08
323		0.00	0.000	0.009	0.3013	0.0321	0.0000	4.06E-08
324		0.00	0.000	0.009	0.3004	0.0321	0.0000	4.06E-08
325		0.06	0.000	0.026	0.3041	0.0321	0.0000	4.06E-08
326		0.04	0.000	0.027	0.3058	0.0321	0.0000	4.06E-08
327		0.60	0.440	0.030	0.3183	0.0321	0.0000	4.06E-08
328		0.00	0.000	0.037	0.3146	0.0321	0.0000	4.06E-08
329		0.00	0.000	0.049	0.3097	0.0321	0.0000	4.06E-08
330	*	0.00	0.000	0.032	0.3065	0.0320	0.0000	4.06E-08
331		0.00	0.000	0.062	0.3004	0.0320	0.0000	4.05E-08
332		0.00	0.000	0.075	0.2929	0.0320	0.0000	4.05E-08
333		0.00	0.000	0.072	0.2857	0.0320	0.0000	4.05E-08
334		0.17	0.015	0.057	0.2955	0.0320	0.0000	4.05E-08
335		0.07	0.000	0.053	0.2970	0.0320	0.0000	4.05E-08
336		0.00	0.000	0.051	0.2918	0.0320	0.0000	4.05E-08
337		0.00	0.000	0.044	0.2875	0.0320	0.0000	4.05E-08
338		0.00	0.000	0.037	0.2838	0.0320	0.0000	4.05E-08
339		0.00	0.000	0.028	0.2810	0.0320	0.0000	4.05E-08
340		0.00	0.000	0.020	0.2790	0.0320	0.0000	4.05E-08
341		0.00	0.000	0.012	0.2778	0.0319	0.0000	4.05E-08
342		0.00	0.000	0.005	0.2773	0.0319	0.0000	4.04E-08
343	*	0.00	0.000	0.003	0.2770	0.0319	0.0000	4.04E-08
344	*	0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08

345	*		0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
346	*		0.00	0.000	0.000	0.2770	0.0319	0.0000	4.04E-08
347	*		0.29	0.000	0.012	0.2790	0.0319	0.0000	4.04E-08
348	*		0.00	0.000	0.030	0.2809	0.0319	0.0000	4.04E-08
349	*		0.00	0.000	0.017	0.2829	0.0319	0.0000	4.04E-08
350	*		0.00	0.000	0.021	0.2849	0.0319	0.0000	4.04E-08
351	*		0.00	0.000	0.019	0.2868	0.0318	0.0000	4.04E-08
352	*		0.00	0.000	0.009	0.2888	0.0318	0.0000	4.04E-08
353	*		0.03	0.000	0.007	0.2908	0.0318	0.0000	4.04E-08
354	*		0.00	0.000	0.000	0.2928	0.0318	0.0000	4.03E-08
355	*		0.03	0.000	0.000	0.2947	0.0318	0.0000	4.03E-08
356	*		0.00	0.000	0.013	0.2967	0.0318	0.0000	4.03E-08
357	*		0.00	0.000	0.021	0.2967	0.0318	0.0000	4.03E-08
358			0.00	0.000	0.015	0.2952	0.0318	0.0000	4.03E-08
359	*	*	0.00	0.000	0.000	0.2952	0.0318	0.0000	4.03E-08
360	*	*	0.00	0.000	0.000	0.2952	0.0318	0.0000	4.03E-08
361	*	*	0.00	0.000	0.000	0.2952	0.0318	0.0000	4.03E-08
362	*	*	0.00	0.000	0.000	0.2952	0.0317	0.0000	4.03E-08
363	*	*	0.00	0.000	0.000	0.2952	0.0317	0.0000	4.03E-08
364	*	*	0.00	0.000	0.000	0.2952	0.0317	0.0000	4.03E-08
365	*	*	0.00	0.000	0.000	0.2952	0.0317	0.0000	4.02E-08

* = Frozen (air or soil)

Annual Totals for Year 5			
	inches	cubic feet	percent
Precipitation	22.07	80,122.3	100.00
Runoff	10.524	38,201.0	47.68
Evapotranspiration	11.381	41,311.4	51.56
Recirculation into Layer 1	0.0013	4.8933	0.01
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0013	4.8933	0.01
Percolation/Leakage through Layer 5	0.000015	0.0544	0.00
Average Head on Top of Layer 4	0.0326	---	---
Change in Water Storage	0.1680	609.9	0.76
Soil Water at Start of Year	1,406.4882	5,105,552.0	6372.20
Soil Water at End of Year	1,406.6562	5,106,161.9	6372.96
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0013	-4.8939	-0.01

Daily Output for Year 6

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*	*	0.00	0.000	0.000	0.2952	0.0317	0.0000	4.02E-08
2	*	*	0.00	0.000	0.000	0.2952	0.0317	0.0000	4.02E-08
3	*	*	0.00	0.000	0.000	0.2952	0.0317	0.0000	4.02E-08
4		*	0.10	0.000	0.018	0.3032	0.0317	0.0000	4.02E-08
5	*	*	0.00	0.000	0.000	0.3032	0.0317	0.0000	4.02E-08
6	*	*	0.00	0.000	0.000	0.3032	0.0317	0.0000	4.02E-08
7		*	0.00	0.000	0.000	0.3032	0.0317	0.0000	4.02E-08
8		*	0.05	0.000	0.017	0.3067	0.0316	0.0000	4.02E-08
9			0.00	0.000	0.015	0.3053	0.0316	0.0000	4.02E-08
10			0.00	0.000	0.013	0.3039	0.0316	0.0000	4.02E-08
11			0.00	0.000	0.013	0.3026	0.0316	0.0000	4.02E-08
12			0.00	0.000	0.012	0.3014	0.0316	0.0000	4.01E-08
13			0.02	0.000	0.025	0.3013	0.0316	0.0000	4.01E-08
14			0.00	0.000	0.011	0.3002	0.0316	0.0000	4.01E-08
15			0.00	0.000	0.014	0.2988	0.0316	0.0000	4.01E-08
16			0.09	0.000	0.031	0.3048	0.0316	0.0000	4.01E-08
17	*		0.14	0.000	0.021	0.3068	0.0316	0.0000	4.01E-08
18			0.00	0.000	0.075	0.3093	0.0316	0.0000	4.01E-08
19			0.02	0.000	0.025	0.3090	0.0315	0.0000	4.01E-08
20			0.17	0.021	0.032	0.3207	0.0315	0.0000	4.01E-08
21			0.00	0.000	0.053	0.3155	0.0315	0.0000	4.01E-08
22			0.00	0.000	0.012	0.3142	0.0315	0.0000	4.01E-08
23	*		0.00	0.000	0.000	0.3142	0.0315	0.0000	4.00E-08
24	*		0.00	0.000	0.000	0.3142	0.0315	0.0000	4.00E-08

25	*	0.00	0.000	0.000	0.3142	0.0315	0.0000	4.00E-08
26	*	0.53	0.000	0.029	0.3162	0.0315	0.0000	4.00E-08
27	*	0.00	0.000	0.013	0.3182	0.0315	0.0000	4.00E-08
28	*	0.00	0.000	0.026	0.3201	0.0315	0.0000	4.00E-08
29		0.00	0.002	0.033	0.3312	0.0315	0.0000	4.00E-08
30		0.00	0.069	0.064	0.3442	0.0314	0.0000	4.00E-08
31		0.57	0.417	0.094	0.3502	0.0314	0.0000	4.00E-08
32		0.00	0.000	0.097	0.3405	0.0314	0.0000	4.00E-08
33		0.00	0.000	0.110	0.3295	0.0314	0.0000	4.00E-08
34		0.00	0.000	0.113	0.3183	0.0314	0.0000	3.99E-08
35		0.12	0.000	0.213	0.3090	0.0314	0.0000	3.99E-08
36		0.00	0.000	0.118	0.2971	0.0314	0.0000	3.99E-08
37		0.00	0.000	0.051	0.2920	0.0314	0.0000	3.99E-08
38		0.00	0.000	0.040	0.2880	0.0314	0.0000	3.99E-08
39		0.23	0.078	0.051	0.2983	0.0314	0.0000	3.99E-08
40		0.00	0.000	0.030	0.2954	0.0314	0.0000	3.99E-08
41		0.00	0.000	0.027	0.2927	0.0313	0.0000	3.99E-08
42		0.00	0.000	0.025	0.2902	0.0313	0.0000	3.99E-08
43		0.00	0.000	0.023	0.2879	0.0313	0.0000	3.99E-08
44	*	0.00	0.000	0.000	0.2879	0.0313	0.0000	3.99E-08
45		0.00	0.000	0.022	0.2858	0.0313	0.0000	3.99E-08
46		0.00	0.000	0.020	0.2837	0.0313	0.0000	3.98E-08
47		0.00	0.000	0.019	0.2818	0.0313	0.0000	3.98E-08
48		0.00	0.000	0.015	0.2802	0.0313	0.0000	3.98E-08
49		0.00	0.000	0.018	0.2784	0.0313	0.0000	3.98E-08
50		0.00	0.000	0.011	0.2773	0.0313	0.0000	3.98E-08
51		0.16	0.005	0.028	0.2898	0.0312	0.0000	3.98E-08
52		0.00	0.000	0.007	0.2891	0.0312	0.0000	3.98E-08
53		0.00	0.000	0.011	0.2880	0.0312	0.0000	3.98E-08
54		0.33	0.154	0.033	0.3027	0.0312	0.0000	3.98E-08
55		0.01	0.000	0.033	0.3001	0.0312	0.0000	3.98E-08
56		0.00	0.000	0.010	0.2991	0.0312	0.0000	3.98E-08

57		0.00	0.000	0.010	0.2981	0.0312	0.0000	3.98E-08
58		0.00	0.000	0.010	0.2971	0.0312	0.0000	3.97E-08
59		0.00	0.000	0.009	0.2962	0.0312	0.0000	3.97E-08
60		0.00	0.000	0.009	0.2953	0.0312	0.0000	3.97E-08
61		0.00	0.000	0.009	0.2944	0.0312	0.0000	3.97E-08
62		0.00	0.000	0.009	0.2935	0.0312	0.0000	3.97E-08
63		0.00	0.000	0.009	0.2926	0.0311	0.0000	3.97E-08
64		0.00	0.000	0.008	0.2918	0.0311	0.0000	3.97E-08
65		0.00	0.000	0.010	0.2908	0.0311	0.0000	3.97E-08
66		0.00	0.000	0.010	0.2898	0.0311	0.0000	3.97E-08
67		0.00	0.000	0.010	0.2888	0.0311	0.0000	3.97E-08
68		0.05	0.000	0.026	0.2912	0.0311	0.0000	3.97E-08
69		0.00	0.000	0.010	0.2902	0.0311	0.0000	3.96E-08
70		0.00	0.000	0.009	0.2893	0.0311	0.0000	3.96E-08
71		0.00	0.000	0.009	0.2883	0.0311	0.0000	3.96E-08
72		0.00	0.000	0.010	0.2873	0.0311	0.0000	3.96E-08
73		0.00	0.000	0.010	0.2864	0.0311	0.0000	3.96E-08
74		0.00	0.000	0.008	0.2856	0.0310	0.0000	3.96E-08
75		0.00	0.000	0.008	0.2848	0.0310	0.0000	3.96E-08
76		0.00	0.000	0.007	0.2841	0.0310	0.0000	3.96E-08
77	*	0.00	0.000	0.000	0.2841	0.0310	0.0000	3.96E-08
78		0.09	0.000	0.025	0.2902	0.0310	0.0000	3.96E-08
79	*	0.04	0.000	0.044	0.2893	0.0310	0.0000	3.96E-08
80		0.11	0.000	0.026	0.2981	0.0310	0.0000	3.96E-08
81		0.01	0.000	0.015	0.2974	0.0310	0.0000	3.95E-08
82	*	0.05	0.000	0.058	0.2965	0.0310	0.0000	3.95E-08
83		0.03	0.000	0.023	0.2976	0.0310	0.0000	3.95E-08
84		0.00	0.000	0.008	0.2968	0.0311	0.0000	3.96E-08
85		0.00	0.000	0.007	0.2961	0.0311	0.0000	3.96E-08
86		0.00	0.000	0.007	0.2954	0.0311	0.0000	3.96E-08
87		0.00	0.000	0.006	0.2948	0.0311	0.0000	3.96E-08
88		0.00	0.000	0.006	0.2942	0.0311	0.0000	3.96E-08

89	0.00	0.000	0.006	0.2935	0.0310	0.0000	3.96E-08
90	0.00	0.000	0.006	0.2929	0.0310	0.0000	3.96E-08
91	0.11	0.000	0.024	0.3013	0.0310	0.0000	3.96E-08
92	0.00	0.000	0.007	0.3005	0.0310	0.0000	3.96E-08
93	0.03	0.000	0.020	0.3011	0.0310	0.0000	3.96E-08
94	0.00	0.000	0.007	0.3004	0.0310	0.0000	3.96E-08
95	0.00	0.000	0.006	0.2998	0.0310	0.0000	3.96E-08
96	0.05	0.000	0.023	0.3029	0.0310	0.0000	3.96E-08
97	0.73	0.569	0.027	0.3162	0.0310	0.0000	3.96E-08
98	3.07	2.735	0.221	0.3278	0.0310	0.0000	3.96E-08
99	0.02	0.000	0.074	0.3224	0.0310	0.0000	3.96E-08
100	0.02	0.000	0.187	0.3056	0.0310	0.0000	3.96E-08
101	0.04	0.000	0.241	0.2852	0.0310	0.0000	3.96E-08
102	0.01	0.000	0.073	0.2786	0.0310	0.0000	3.96E-08
103	0.00	0.000	0.010	0.2775	0.0312	0.0000	3.98E-08
104	0.00	0.000	0.004	0.2771	0.0321	0.0000	4.07E-08
105	0.00	0.000	0.001	0.2770	0.0330	0.0000	4.15E-08
106	0.00	0.000	0.000	0.2770	0.0330	0.0000	4.15E-08
107	0.00	0.000	0.000	0.2770	0.0330	0.0000	4.15E-08
108	0.00	0.000	0.000	0.2770	0.0330	0.0000	4.14E-08
109	0.00	0.000	0.000	0.2770	0.0330	0.0000	4.14E-08
110	0.00	0.000	0.000	0.2770	0.0330	0.0000	4.14E-08
111	0.01	0.000	0.009	0.2770	0.0330	0.0000	4.14E-08
112	0.01	0.000	0.005	0.2770	0.0330	0.0000	4.14E-08
113	0.00	0.000	0.000	0.2770	0.0329	0.0000	4.14E-08
114	0.00	0.000	0.000	0.2770	0.0329	0.0000	4.14E-08
115	0.00	0.000	0.000	0.2770	0.0329	0.0000	4.14E-08
116	0.17	0.013	0.025	0.2898	0.0329	0.0000	4.14E-08
117	0.79	0.635	0.035	0.3014	0.0329	0.0000	4.14E-08
118	0.23	0.083	0.077	0.3083	0.0329	0.0000	4.14E-08
119	0.96	0.766	0.083	0.3199	0.0329	0.0000	4.14E-08
120	0.05	0.000	0.077	0.3176	0.0329	0.0000	4.13E-08

121	0.08	0.000	0.148	0.3112	0.0329	0.0000	4.13E-08
122	0.02	0.000	0.103	0.3028	0.0329	0.0000	4.13E-08
123	0.47	0.167	0.357	0.2978	0.0328	0.0000	4.13E-08
124	0.00	0.000	0.182	0.2796	0.0328	0.0000	4.13E-08
125	0.03	0.000	0.047	0.2784	0.0328	0.0000	4.13E-08
126	0.15	0.000	0.040	0.2890	0.0338	0.0000	4.23E-08
127	0.04	0.000	0.034	0.2893	0.0350	0.0000	4.34E-08
128	0.00	0.000	0.025	0.2869	0.0350	0.0000	4.34E-08
129	0.01	0.000	0.028	0.2854	0.0350	0.0000	4.33E-08
130	0.18	0.031	0.038	0.2970	0.0350	0.0000	4.33E-08
131	0.03	0.000	0.029	0.2974	0.0350	0.0000	4.33E-08
132	0.00	0.000	0.018	0.2956	0.0350	0.0000	4.34E-08
133	0.00	0.000	0.016	0.2940	0.0351	0.0000	4.34E-08
134	0.00	0.000	0.016	0.2924	0.0351	0.0000	4.34E-08
135	0.02	0.000	0.026	0.2917	0.0351	0.0000	4.34E-08
136	0.00	0.000	0.015	0.2902	0.0351	0.0000	4.34E-08
137	0.00	0.000	0.016	0.2886	0.0351	0.0000	4.34E-08
138	0.00	0.000	0.014	0.2872	0.0351	0.0000	4.34E-08
139	0.29	0.114	0.037	0.3012	0.0351	0.0000	4.34E-08
140	0.00	0.000	0.013	0.2999	0.0350	0.0000	4.34E-08
141	0.00	0.000	0.013	0.2986	0.0350	0.0000	4.34E-08
142	0.28	0.115	0.035	0.3119	0.0350	0.0000	4.34E-08
143	0.66	0.411	0.135	0.3234	0.0350	0.0000	4.34E-08
144	0.00	0.000	0.139	0.3095	0.0350	0.0000	4.34E-08
145	0.00	0.000	0.168	0.2927	0.0350	0.0000	4.33E-08
146	0.00	0.000	0.106	0.2820	0.0350	0.0000	4.33E-08
147	0.00	0.000	0.046	0.2774	0.0350	0.0000	4.33E-08
148	0.00	0.000	0.002	0.2772	0.0350	0.0000	4.33E-08
149	0.00	0.000	0.002	0.2770	0.0350	0.0000	4.33E-08
150	0.00	0.000	0.000	0.2770	0.0349	0.0000	4.33E-08
151	0.00	0.000	0.002	0.2770	0.0349	0.0000	4.33E-08
152	0.00	0.000	0.000	0.2770	0.0349	0.0000	4.33E-08

153	0.00	0.000	0.000	0.2770	0.0349	0.0000	4.33E-08
154	0.00	0.000	0.000	0.2770	0.0349	0.0000	4.33E-08
155	0.00	0.000	0.000	0.2770	0.0349	0.0000	4.32E-08
156	0.00	0.000	0.000	0.2770	0.0349	0.0000	4.32E-08
157	0.67	0.471	0.039	0.2932	0.0349	0.0000	4.32E-08
158	0.00	0.000	0.010	0.2922	0.0349	0.0000	4.32E-08
159	0.00	0.000	0.015	0.2907	0.0349	0.0000	4.32E-08
160	0.00	0.000	0.014	0.2893	0.0348	0.0000	4.32E-08
161	0.00	0.000	0.013	0.2880	0.0348	0.0000	4.32E-08
162	0.00	0.000	0.013	0.2867	0.0348	0.0000	4.32E-08
163	0.00	0.000	0.012	0.2855	0.0348	0.0000	4.32E-08
164	0.00	0.000	0.012	0.2843	0.0348	0.0000	4.32E-08
165	0.04	0.000	0.030	0.2852	0.0348	0.0000	4.32E-08
166	0.97	0.803	0.034	0.2984	0.0348	0.0000	4.32E-08
167	1.16	0.859	0.182	0.3098	0.0348	0.0000	4.31E-08
168	0.21	0.059	0.132	0.3115	0.0348	0.0000	4.31E-08
169	0.01	0.000	0.241	0.2880	0.0348	0.0000	4.31E-08
170	0.51	0.202	0.293	0.2894	0.0348	0.0000	4.31E-08
171	0.00	0.000	0.093	0.2801	0.0348	0.0000	4.31E-08
172	0.00	0.000	0.023	0.2778	0.0347	0.0000	4.31E-08
173	0.00	0.000	0.006	0.2772	0.0347	0.0000	4.31E-08
174	0.00	0.000	0.001	0.2771	0.0349	0.0000	4.33E-08
175	0.00	0.000	0.001	0.2770	0.0354	0.0000	4.38E-08
176	0.00	0.000	0.000	0.2770	0.0355	0.0000	4.38E-08
177	0.00	0.000	0.002	0.2770	0.0356	0.0000	4.39E-08
178	0.20	0.049	0.031	0.2894	0.0356	0.0000	4.39E-08
179	0.00	0.000	0.011	0.2883	0.0356	0.0000	4.39E-08
180	0.00	0.000	0.018	0.2865	0.0355	0.0000	4.39E-08
181	0.00	0.000	0.017	0.2848	0.0355	0.0000	4.38E-08
182	0.85	0.658	0.040	0.2997	0.0355	0.0000	4.38E-08
183	0.02	0.000	0.059	0.2960	0.0355	0.0000	4.38E-08
184	0.00	0.000	0.136	0.2824	0.0355	0.0000	4.38E-08

185	0.00	0.000	0.050	0.2774	0.0355	0.0000	4.38E-08
186	0.00	0.000	0.002	0.2772	0.0355	0.0000	4.38E-08
187	0.00	0.000	0.002	0.2771	0.0355	0.0000	4.38E-08
188	0.00	0.000	0.000	0.2770	0.0360	0.0000	4.43E-08
189	0.12	0.000	0.022	0.2872	0.0363	0.0000	4.46E-08
190	1.50	1.320	0.047	0.3002	0.0363	0.0000	4.45E-08
191	0.00	0.000	0.072	0.2930	0.0363	0.0000	4.45E-08
192	0.00	0.000	0.127	0.2804	0.0363	0.0000	4.45E-08
193	0.00	0.000	0.026	0.2778	0.0363	0.0000	4.45E-08
194	0.00	0.000	0.004	0.2774	0.0362	0.0000	4.45E-08
195	0.02	0.000	0.017	0.2772	0.0362	0.0000	4.45E-08
196	0.00	0.000	0.002	0.2771	0.0362	0.0000	4.45E-08
197	0.00	0.000	0.000	0.2770	0.0362	0.0000	4.45E-08
198	0.00	0.000	0.000	0.2770	0.0362	0.0000	4.45E-08
199	0.00	0.000	0.000	0.2770	0.0362	0.0000	4.45E-08
200	0.00	0.000	0.000	0.2770	0.0362	0.0000	4.45E-08
201	0.00	0.000	0.000	0.2770	0.0362	0.0000	4.44E-08
202	0.00	0.000	0.000	0.2770	0.0362	0.0000	4.44E-08
203	0.00	0.000	0.000	0.2770	0.0362	0.0000	4.44E-08
204	0.00	0.000	0.000	0.2770	0.0361	0.0000	4.44E-08
205	2.12	1.915	0.040	0.2931	0.0361	0.0000	4.44E-08
206	0.98	0.744	0.119	0.3046	0.0361	0.0000	4.44E-08
207	0.41	0.178	0.222	0.3053	0.0361	0.0000	4.44E-08
208	0.00	0.000	0.175	0.2878	0.0361	0.0000	4.44E-08
209	0.00	0.000	0.064	0.2813	0.0361	0.0000	4.44E-08
210	0.03	0.000	0.056	0.2783	0.0361	0.0000	4.44E-08
211	0.01	0.000	0.017	0.2774	0.0361	0.0000	4.44E-08
212	0.00	0.000	0.003	0.2771	0.0361	0.0000	4.43E-08
213	0.00	0.000	0.001	0.2770	0.0363	0.0000	4.46E-08
214	0.00	0.000	0.000	0.2770	0.0366	0.0000	4.48E-08
215	0.00	0.000	0.000	0.2770	0.0366	0.0000	4.48E-08
216	0.00	0.000	0.000	0.2770	0.0365	0.0000	4.48E-08

217	0.00	0.000	0.000	0.2770	0.0365	0.0000	4.48E-08
218	0.00	0.000	0.000	0.2770	0.0365	0.0000	4.48E-08
219	0.00	0.000	0.000	0.2770	0.0365	0.0000	4.48E-08
220	0.00	0.000	0.003	0.2770	0.0365	0.0000	4.48E-08
221	0.07	0.000	0.020	0.2819	0.0365	0.0000	4.47E-08
222	0.00	0.000	0.010	0.2809	0.0365	0.0000	4.47E-08
223	0.03	0.000	0.028	0.2814	0.0365	0.0000	4.47E-08
224	0.00	0.000	0.010	0.2804	0.0365	0.0000	4.47E-08
225	0.52	0.343	0.037	0.2941	0.0365	0.0000	4.47E-08
226	0.00	0.000	0.008	0.2932	0.0364	0.0000	4.47E-08
227	0.00	0.000	0.014	0.2918	0.0364	0.0000	4.47E-08
228	0.00	0.000	0.013	0.2905	0.0364	0.0000	4.47E-08
229	0.47	0.290	0.038	0.3044	0.0364	0.0000	4.47E-08
230	0.00	0.000	0.058	0.2986	0.0364	0.0000	4.47E-08
231	0.00	0.000	0.013	0.2973	0.0364	0.0000	4.47E-08
232	0.00	0.000	0.011	0.2962	0.0364	0.0000	4.47E-08
233	0.00	0.000	0.011	0.2951	0.0364	0.0000	4.47E-08
234	0.00	0.000	0.011	0.2940	0.0364	0.0000	4.47E-08
235	0.00	0.000	0.013	0.2927	0.0364	0.0000	4.47E-08
236	1.02	0.845	0.036	0.3071	0.0364	0.0000	4.46E-08
237	0.65	0.331	0.260	0.3127	0.0364	0.0000	4.46E-08
238	0.10	0.000	0.188	0.3037	0.0364	0.0000	4.46E-08
239	0.00	0.000	0.193	0.2844	0.0364	0.0000	4.46E-08
240	0.00	0.000	0.060	0.2785	0.0364	0.0000	4.46E-08
241	0.08	0.000	0.042	0.2825	0.0364	0.0000	4.47E-08
242	0.12	0.000	0.045	0.2904	0.0364	0.0000	4.47E-08
243	0.00	0.000	0.019	0.2885	0.0364	0.0000	4.47E-08
244	0.00	0.000	0.023	0.2862	0.0364	0.0000	4.47E-08
245	0.00	0.000	0.022	0.2840	0.0364	0.0000	4.46E-08
246	0.00	0.000	0.019	0.2821	0.0364	0.0000	4.46E-08
247	0.02	0.000	0.029	0.2807	0.0364	0.0000	4.46E-08
248	0.00	0.000	0.020	0.2790	0.0364	0.0000	4.46E-08

249		0.00	0.000	0.013	0.2777	0.0363	0.0000	4.46E-08
250		0.00	0.000	0.006	0.2771	0.0363	0.0000	4.46E-08
251		0.00	0.000	0.001	0.2770	0.0363	0.0000	4.46E-08
252		0.40	0.217	0.039	0.2913	0.0363	0.0000	4.46E-08
253		0.55	0.399	0.038	0.3029	0.0364	0.0000	4.47E-08
254		0.00	0.000	0.068	0.2961	0.0364	0.0000	4.47E-08
255		0.00	0.000	0.086	0.2875	0.0364	0.0000	4.46E-08
256		0.00	0.000	0.040	0.2835	0.0364	0.0000	4.46E-08
257		0.00	0.000	0.038	0.2797	0.0364	0.0000	4.46E-08
258		1.55	1.318	0.073	0.2960	0.0364	0.0000	4.46E-08
259		1.11	0.912	0.080	0.3075	0.0363	0.0000	4.46E-08
260		0.00	0.000	0.093	0.2982	0.0363	0.0000	4.46E-08
261		0.00	0.000	0.148	0.2834	0.0363	0.0000	4.46E-08
262		0.00	0.000	0.052	0.2782	0.0363	0.0000	4.46E-08
263		0.00	0.000	0.009	0.2774	0.0363	0.0000	4.46E-08
264		0.06	0.000	0.029	0.2804	0.0363	0.0000	4.46E-08
265		0.00	0.000	0.005	0.2799	0.0365	0.0000	4.48E-08
266		0.00	0.000	0.012	0.2786	0.0367	0.0000	4.50E-08
267		0.00	0.000	0.006	0.2781	0.0367	0.0000	4.50E-08
268		0.00	0.000	0.006	0.2774	0.0367	0.0000	4.50E-08
269		0.00	0.000	0.003	0.2771	0.0367	0.0000	4.50E-08
270	*	0.00	0.000	0.001	0.2770	0.0367	0.0000	4.49E-08
271		0.10	0.000	0.021	0.2853	0.0367	0.0000	4.49E-08
272		0.33	0.158	0.042	0.2985	0.0367	0.0000	4.49E-08
273		0.00	0.000	0.009	0.2976	0.0367	0.0000	4.49E-08
274		0.02	0.000	0.026	0.2969	0.0367	0.0000	4.49E-08
275		0.00	0.000	0.013	0.2956	0.0367	0.0000	4.49E-08
276		0.00	0.000	0.013	0.2944	0.0366	0.0000	4.49E-08
277		0.00	0.000	0.012	0.2931	0.0366	0.0000	4.49E-08
278		0.00	0.000	0.012	0.2920	0.0366	0.0000	4.49E-08
279		0.95	0.767	0.036	0.3062	0.0366	0.0000	4.49E-08
280		0.00	0.000	0.153	0.2910	0.0366	0.0000	4.48E-08

281		0.00	0.000	0.117	0.2793	0.0366	0.0000	4.48E-08
282		0.00	0.000	0.012	0.2780	0.0366	0.0000	4.48E-08
283		0.00	0.000	0.008	0.2772	0.0366	0.0000	4.48E-08
284		0.00	0.000	0.002	0.2770	0.0366	0.0000	4.48E-08
285		0.00	0.000	0.000	0.2770	0.0367	0.0000	4.49E-08
286		0.00	0.000	0.000	0.2770	0.0368	0.0000	4.51E-08
287		1.00	0.788	0.047	0.2933	0.0368	0.0000	4.51E-08
288		0.00	0.000	0.057	0.2876	0.0368	0.0000	4.50E-08
289		0.00	0.000	0.017	0.2859	0.0368	0.0000	4.50E-08
290		2.98	2.780	0.043	0.3011	0.0368	0.0000	4.50E-08
291		0.00	0.000	0.078	0.2933	0.0368	0.0000	4.50E-08
292		0.45	0.233	0.082	0.3071	0.0368	0.0000	4.50E-08
293		0.04	0.000	0.059	0.3050	0.0368	0.0000	4.50E-08
294		0.00	0.000	0.073	0.2976	0.0368	0.0000	4.50E-08
295		0.00	0.000	0.043	0.2934	0.0367	0.0000	4.50E-08
296		0.00	0.000	0.054	0.2879	0.0367	0.0000	4.50E-08
297		0.51	0.287	0.069	0.3033	0.0367	0.0000	4.50E-08
298	*	0.05	0.000	0.065	0.3019	0.0367	0.0000	4.49E-08
299		0.27	0.098	0.068	0.3125	0.0367	0.0000	4.49E-08
300		0.01	0.000	0.062	0.3068	0.0367	0.0000	4.49E-08
301		0.00	0.000	0.044	0.3024	0.0367	0.0000	4.49E-08
302		0.00	0.000	0.059	0.2966	0.0367	0.0000	4.49E-08
303		0.10	0.000	0.099	0.2971	0.0367	0.0000	4.49E-08
304		0.00	0.000	0.081	0.2890	0.0367	0.0000	4.50E-08
305		0.00	0.000	0.086	0.2805	0.0367	0.0000	4.50E-08
306		0.00	0.000	0.027	0.2778	0.0367	0.0000	4.50E-08
307	*	0.00	0.000	0.006	0.2771	0.0370	0.0000	4.52E-08
308		0.00	0.000	0.001	0.2770	0.0373	0.0000	4.55E-08
309		0.79	0.526	0.106	0.2933	0.0373	0.0000	4.55E-08
310		0.53	0.322	0.092	0.3049	0.0373	0.0000	4.55E-08
311		0.00	0.000	0.056	0.2994	0.0373	0.0000	4.55E-08
312		0.06	0.000	0.058	0.2997	0.0373	0.0000	4.55E-08

313		0.00	0.000	0.076	0.2922	0.0373	0.0000	4.55E-08
314		0.00	0.000	0.071	0.2850	0.0373	0.0000	4.55E-08
315		0.00	0.000	0.059	0.2791	0.0373	0.0000	4.55E-08
316		0.00	0.000	0.011	0.2780	0.0373	0.0000	4.55E-08
317		0.11	0.000	0.032	0.2858	0.0372	0.0000	4.54E-08
318		0.17	0.009	0.039	0.2975	0.0372	0.0000	4.54E-08
319		0.02	0.000	0.035	0.2960	0.0372	0.0000	4.54E-08
320		0.00	0.000	0.073	0.2887	0.0372	0.0000	4.54E-08
321		0.00	0.000	0.068	0.2819	0.0372	0.0000	4.54E-08
322		0.31	0.131	0.062	0.2934	0.0372	0.0000	4.54E-08
323		0.27	0.091	0.115	0.2997	0.0372	0.0000	4.54E-08
324		0.45	0.239	0.096	0.3113	0.0372	0.0000	4.54E-08
325		0.05	0.000	0.130	0.3030	0.0372	0.0000	4.54E-08
326		0.89	0.667	0.090	0.3159	0.0371	0.0000	4.54E-08
327	*	0.71	0.000	0.034	0.3179	0.0371	0.0000	4.53E-08
328		0.05	0.307	0.000	0.3305	0.0371	0.0000	4.53E-08
329		0.45	0.613	0.000	0.3422	0.0371	0.0000	4.53E-08
330		0.18	0.044	0.049	0.3511	0.0371	0.0000	4.53E-08
331	*	0.11	0.000	0.029	0.3530	0.0371	0.0000	4.53E-08
332	*	0.00	0.000	0.028	0.3550	0.0371	0.0000	4.53E-08
333	*	0.00	0.000	0.016	0.3550	0.0371	0.0000	4.53E-08
334	*	0.00	0.000	0.000	0.3550	0.0371	0.0000	4.53E-08
335	*	0.00	0.000	0.000	0.3550	0.0370	0.0000	4.53E-08
336	*	0.00	0.000	0.000	0.3550	0.0370	0.0000	4.53E-08
337	*	0.00	0.000	0.000	0.3550	0.0370	0.0000	4.52E-08
338	*	0.00	0.000	0.000	0.3550	0.0370	0.0000	4.52E-08
339	*	0.00	0.000	0.000	0.3550	0.0370	0.0000	4.52E-08
340	*	0.00	0.000	0.000	0.3550	0.0370	0.0000	4.52E-08
341	*	0.00	0.000	0.000	0.3550	0.0370	0.0000	4.52E-08
342		0.00	0.000	0.045	0.3506	0.0370	0.0000	4.52E-08
343	*	0.17	0.000	0.039	0.3525	0.0370	0.0000	4.52E-08
344	*	0.00	0.000	0.037	0.3545	0.0369	0.0000	4.52E-08

345	*		0.00	0.000	0.032	0.3565	0.0369	0.0000	4.52E-08
346	*		0.00	0.000	0.002	0.3565	0.0369	0.0000	4.52E-08
347			0.00	0.000	0.036	0.3528	0.0369	0.0000	4.51E-08
348	*	*	0.00	0.000	0.000	0.3528	0.0369	0.0000	4.51E-08
349	*	*	0.00	0.000	0.000	0.3528	0.0369	0.0000	4.51E-08
350	*	*	0.00	0.000	0.000	0.3528	0.0369	0.0000	4.51E-08
351	*	*	0.00	0.000	0.000	0.3528	0.0369	0.0000	4.51E-08
352	*	*	0.00	0.000	0.000	0.3528	0.0369	0.0000	4.51E-08
353	*	*	0.00	0.000	0.000	0.3528	0.0369	0.0000	4.51E-08
354		*	0.00	0.000	0.000	0.3528	0.0368	0.0000	4.51E-08
355		*	0.00	0.000	0.002	0.3529	0.0368	0.0000	4.51E-08
356			0.03	0.000	0.081	0.3480	0.0368	0.0000	4.51E-08
357			0.00	0.000	0.136	0.3345	0.0368	0.0000	4.50E-08
358			0.00	0.000	0.086	0.3259	0.0368	0.0000	4.50E-08
359			0.34	0.147	0.142	0.3309	0.0368	0.0000	4.50E-08
360			0.00	0.000	0.056	0.3256	0.0368	0.0000	4.50E-08
361			0.00	0.000	0.040	0.3215	0.0368	0.0000	4.50E-08
362			0.00	0.000	0.068	0.3148	0.0368	0.0000	4.50E-08
363			0.00	0.000	0.075	0.3073	0.0367	0.0000	4.50E-08
364			0.00	0.000	0.060	0.3013	0.0367	0.0000	4.50E-08
365			0.00	0.000	0.053	0.2960	0.0367	0.0000	4.50E-08

* = Frozen (air or soil)

Annual Totals for Year 6			
	inches	cubic feet	percent
Precipitation	40.57	147,278.8	100.00
Runoff	26.506	96,216.9	65.33
Evapotranspiration	14.057	51,027.5	34.65
Recirculation into Layer 1	0.0014	5.2027	0.00
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0014	5.2027	0.00
Percolation/Leakage through Layer 5	0.000016	0.0570	0.00
Average Head on Top of Layer 4	0.0346	---	---
Change in Water Storage	0.0095	34.4	0.02
Soil Water at Start of Year	1,406.6562	5,106,161.9	3467.00
Soil Water at End of Year	1,406.6657	5,106,196.3	3467.03
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0014	-5.2006	0.00

Daily Output for Year 7

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.032	0.2928	0.0367	0.0000	4.49E-08
2			0.00	0.000	0.040	0.2888	0.0367	0.0000	4.49E-08
3	*		0.00	0.000	0.035	0.2853	0.0367	0.0000	4.49E-08
4			0.00	0.000	0.035	0.2818	0.0367	0.0000	4.49E-08
5			0.06	0.000	0.049	0.2829	0.0367	0.0000	4.49E-08
6			0.00	0.000	0.022	0.2806	0.0367	0.0000	4.49E-08
7			0.62	0.434	0.044	0.2945	0.0366	0.0000	4.49E-08
8			0.79	0.610	0.067	0.3062	0.0366	0.0000	4.49E-08
9	*		0.10	0.000	0.036	0.3081	0.0366	0.0000	4.49E-08
10	*		0.10	0.000	0.020	0.3101	0.0366	0.0000	4.49E-08
11	*		0.00	0.000	0.044	0.3121	0.0366	0.0000	4.48E-08
12	*		0.00	0.000	0.045	0.3115	0.0366	0.0000	4.48E-08
13	*		0.00	0.000	0.025	0.3090	0.0366	0.0000	4.48E-08
14	*		0.00	0.000	0.023	0.3066	0.0366	0.0000	4.48E-08
15	*		0.00	0.000	0.000	0.3066	0.0366	0.0000	4.48E-08
16	*		0.04	0.000	0.038	0.3066	0.0366	0.0000	4.48E-08
17	*		0.03	0.000	0.025	0.3066	0.0365	0.0000	4.48E-08
18	*		0.11	0.000	0.024	0.3086	0.0365	0.0000	4.48E-08
19			0.00	0.000	0.071	0.3086	0.0365	0.0000	4.48E-08
20			0.00	0.000	0.046	0.3039	0.0365	0.0000	4.48E-08
21	*		0.00	0.000	0.000	0.3039	0.0365	0.0000	4.47E-08
22	*		0.18	0.000	0.042	0.3059	0.0365	0.0000	4.47E-08
23	*		0.00	0.000	0.000	0.3079	0.0365	0.0000	4.47E-08
24	*		0.82	0.000	0.022	0.3098	0.0365	0.0000	4.47E-08

25		0.00	0.639	0.000	0.3226	0.0365	0.0000	4.47E-08
26		0.01	0.002	0.098	0.3250	0.0364	0.0000	4.47E-08
27		0.05	0.000	0.104	0.3199	0.0364	0.0000	4.47E-08
28		0.20	0.047	0.103	0.3251	0.0364	0.0000	4.47E-08
29		0.04	0.000	0.105	0.3191	0.0364	0.0000	4.47E-08
30		0.19	0.037	0.111	0.3233	0.0364	0.0000	4.47E-08
31		0.00	0.000	0.090	0.3144	0.0364	0.0000	4.46E-08
32		0.00	0.000	0.069	0.3074	0.0370	0.0000	4.52E-08
33	*	0.00	0.000	0.040	0.3034	0.0376	0.0000	4.58E-08
34	*	0.00	0.000	0.000	0.3034	0.0376	0.0000	4.58E-08
35	*	0.00	0.000	0.000	0.3034	0.0376	0.0000	4.58E-08
36		0.00	0.000	0.050	0.2985	0.0376	0.0000	4.58E-08
37		0.00	0.000	0.030	0.2954	0.0376	0.0000	4.58E-08
38	*	0.00	0.000	0.043	0.2911	0.0376	0.0000	4.58E-08
39	*	0.00	0.000	0.000	0.2911	0.0376	0.0000	4.58E-08
40	*	0.05	0.000	0.033	0.2925	0.0376	0.0000	4.57E-08
41		0.05	0.000	0.085	0.2893	0.0376	0.0000	4.57E-08
42		0.14	0.000	0.056	0.2971	0.0375	0.0000	4.57E-08
43		0.00	0.000	0.088	0.2883	0.0375	0.0000	4.57E-08
44	*	0.00	0.000	0.040	0.2843	0.0375	0.0000	4.57E-08
45		0.00	0.000	0.056	0.2787	0.0375	0.0000	4.57E-08
46		0.00	0.000	0.013	0.2774	0.0375	0.0000	4.57E-08
47		0.00	0.000	0.003	0.2771	0.0375	0.0000	4.57E-08
48		0.00	0.000	0.003	0.2770	0.0375	0.0000	4.57E-08
49		0.12	0.000	0.021	0.2865	0.0376	0.0000	4.57E-08
50		0.09	0.000	0.031	0.2925	0.0376	0.0000	4.58E-08
51		0.01	0.000	0.018	0.2915	0.0376	0.0000	4.58E-08
52		0.00	0.000	0.017	0.2898	0.0376	0.0000	4.58E-08
53		0.00	0.000	0.016	0.2882	0.0376	0.0000	4.58E-08
54		0.00	0.000	0.015	0.2867	0.0376	0.0000	4.58E-08
55	*	0.00	0.000	0.014	0.2853	0.0376	0.0000	4.58E-08
56		0.00	0.000	0.013	0.2839	0.0376	0.0000	4.57E-08

57		0.01	0.000	0.018	0.2827	0.0376	0.0000	4.57E-08
58		0.00	0.000	0.012	0.2815	0.0375	0.0000	4.57E-08
59		0.02	0.000	0.024	0.2811	0.0375	0.0000	4.57E-08
60		0.21	0.064	0.030	0.2931	0.0375	0.0000	4.57E-08
61		0.26	0.112	0.035	0.3047	0.0375	0.0000	4.57E-08
62		0.33	0.135	0.170	0.3073	0.0375	0.0000	4.57E-08
63		0.35	0.158	0.107	0.3161	0.0375	0.0000	4.57E-08
64		0.24	0.089	0.172	0.3142	0.0375	0.0000	4.57E-08
65		0.29	0.114	0.232	0.3087	0.0375	0.0000	4.57E-08
66		0.00	0.000	0.080	0.3011	0.0375	0.0000	4.56E-08
67		0.00	0.000	0.108	0.2902	0.0374	0.0000	4.56E-08
68		0.00	0.000	0.039	0.2863	0.0374	0.0000	4.56E-08
69		0.00	0.000	0.035	0.2829	0.0378	0.0000	4.59E-08
70		0.00	0.000	0.029	0.2800	0.0381	0.0000	4.62E-08
71		0.30	0.130	0.049	0.2922	0.0381	0.0000	4.62E-08
72		0.00	0.000	0.025	0.2897	0.0381	0.0000	4.62E-08
73		0.00	0.000	0.024	0.2873	0.0381	0.0000	4.62E-08
74		0.00	0.000	0.016	0.2857	0.0381	0.0000	4.62E-08
75	*	0.00	0.000	0.015	0.2842	0.0380	0.0000	4.62E-08
76		0.13	0.000	0.032	0.2938	0.0380	0.0000	4.62E-08
77		0.09	0.000	0.035	0.2997	0.0380	0.0000	4.62E-08
78		0.05	0.000	0.026	0.3016	0.0380	0.0000	4.62E-08
79		0.00	0.000	0.013	0.3003	0.0380	0.0000	4.62E-08
80		0.00	0.000	0.012	0.2991	0.0380	0.0000	4.61E-08
81		0.00	0.000	0.012	0.2980	0.0380	0.0000	4.61E-08
82		0.12	0.000	0.029	0.3066	0.0380	0.0000	4.61E-08
83		0.09	0.000	0.105	0.3048	0.0380	0.0000	4.61E-08
84		0.03	0.000	0.029	0.3046	0.0379	0.0000	4.61E-08
85		0.00	0.000	0.017	0.3031	0.0379	0.0000	4.61E-08
86		0.00	0.000	0.011	0.3020	0.0379	0.0000	4.61E-08
87	*	0.02	0.000	0.019	0.3020	0.0379	0.0000	4.61E-08
88	*	0.00	0.000	0.010	0.3010	0.0379	0.0000	4.61E-08

89		0.00	0.000	0.010	0.3001	0.0379	0.0000	4.61E-08
90		0.00	0.000	0.010	0.2991	0.0379	0.0000	4.60E-08
91		0.07	0.000	0.027	0.3030	0.0379	0.0000	4.60E-08
92		0.02	0.000	0.022	0.3028	0.0379	0.0000	4.60E-08
93		0.00	0.000	0.011	0.3017	0.0379	0.0000	4.60E-08
94		0.00	0.000	0.011	0.3006	0.0378	0.0000	4.60E-08
95	*	0.00	0.000	0.000	0.3006	0.0378	0.0000	4.60E-08
96	*	0.00	0.000	0.009	0.2997	0.0378	0.0000	4.60E-08
97		0.18	0.026	0.027	0.3120	0.0378	0.0000	4.60E-08
98		0.00	0.000	0.074	0.3046	0.0378	0.0000	4.60E-08
99	*	0.25	0.000	0.033	0.3066	0.0378	0.0000	4.60E-08
100	*	1.38	0.000	0.027	0.3085	0.0378	0.0000	4.59E-08
101	*	0.00	0.000	0.054	0.3105	0.0378	0.0000	4.59E-08
102		0.00	0.000	0.051	0.3125	0.0378	0.0000	4.59E-08
103		0.00	0.412	0.000	0.3252	0.0377	0.0000	4.59E-08
104		0.00	0.599	0.133	0.3368	0.0377	0.0000	4.59E-08
105		0.00	0.000	0.173	0.3195	0.0377	0.0000	4.59E-08
106		0.63	0.315	0.231	0.3276	0.0377	0.0000	4.59E-08
107		0.00	0.000	0.106	0.3170	0.0377	0.0000	4.59E-08
108		0.00	0.000	0.059	0.3111	0.0377	0.0000	4.59E-08
109		1.15	0.928	0.082	0.3255	0.0377	0.0000	4.59E-08
110		0.26	0.110	0.121	0.3280	0.0377	0.0000	4.58E-08
111		0.00	0.000	0.124	0.3156	0.0377	0.0000	4.58E-08
112	*	0.01	0.000	0.045	0.3122	0.0376	0.0000	4.58E-08
113		0.00	0.000	0.066	0.3058	0.0376	0.0000	4.58E-08
114	*	0.00	0.000	0.091	0.2967	0.0379	0.0000	4.60E-08
115		0.00	0.000	0.100	0.2866	0.0385	0.0000	4.67E-08
116	*	0.00	0.000	0.000	0.2866	0.0385	0.0000	4.66E-08
117		0.00	0.000	0.078	0.2789	0.0385	0.0000	4.66E-08
118		0.45	0.181	0.150	0.2904	0.0385	0.0000	4.66E-08
119		0.73	0.424	0.194	0.3019	0.0385	0.0000	4.66E-08
120		2.18	1.974	0.092	0.3135	0.0385	0.0000	4.66E-08

121	0.00	0.000	0.152	0.2983	0.0385	0.0000	4.66E-08
122	0.00	0.000	0.079	0.2904	0.0385	0.0000	4.66E-08
123	0.04	0.000	0.139	0.2802	0.0385	0.0000	4.66E-08
124	0.00	0.000	0.024	0.2778	0.0384	0.0000	4.66E-08
125	0.00	0.000	0.006	0.2772	0.0384	0.0000	4.66E-08
126	0.99	0.753	0.074	0.2934	0.0384	0.0000	4.65E-08
127	0.47	0.182	0.202	0.3023	0.0384	0.0000	4.65E-08
128	0.00	0.000	0.074	0.2949	0.0384	0.0000	4.65E-08
129	0.00	0.000	0.080	0.2870	0.0384	0.0000	4.65E-08
130	0.00	0.000	0.080	0.2790	0.0384	0.0000	4.65E-08
131	0.00	0.000	0.013	0.2777	0.0384	0.0000	4.65E-08
132	0.00	0.000	0.005	0.2772	0.0383	0.0000	4.65E-08
133	0.13	0.000	0.025	0.2880	0.0383	0.0000	4.65E-08
134	0.00	0.000	0.015	0.2865	0.0383	0.0000	4.65E-08
135	0.00	0.000	0.018	0.2846	0.0383	0.0000	4.64E-08
136	0.19	0.043	0.037	0.2958	0.0383	0.0000	4.64E-08
137	0.01	0.000	0.021	0.2948	0.0383	0.0000	4.64E-08
138	0.01	0.000	0.028	0.2935	0.0383	0.0000	4.64E-08
139	0.07	0.000	0.036	0.2971	0.0383	0.0000	4.64E-08
140	0.50	0.343	0.042	0.3090	0.0383	0.0000	4.64E-08
141	0.18	0.018	0.179	0.3068	0.0383	0.0000	4.64E-08
142	0.11	0.000	0.104	0.3072	0.0382	0.0000	4.64E-08
143	0.12	0.001	0.198	0.2998	0.0382	0.0000	4.64E-08
144	0.00	0.000	0.089	0.2909	0.0382	0.0000	4.64E-08
145	0.00	0.000	0.044	0.2864	0.0382	0.0000	4.63E-08
146	0.24	0.088	0.052	0.2966	0.0383	0.0000	4.64E-08
147	0.03	0.000	0.046	0.2950	0.0383	0.0000	4.64E-08
148	0.01	0.000	0.041	0.2918	0.0383	0.0000	4.64E-08
149	0.49	0.299	0.052	0.3053	0.0383	0.0000	4.64E-08
150	0.05	0.000	0.131	0.2968	0.0383	0.0000	4.64E-08
151	0.00	0.000	0.022	0.2946	0.0383	0.0000	4.64E-08
152	0.00	0.000	0.022	0.2924	0.0383	0.0000	4.64E-08

153	0.00	0.000	0.020	0.2904	0.0383	0.0000	4.64E-08
154	0.00	0.000	0.020	0.2884	0.0383	0.0000	4.64E-08
155	0.00	0.000	0.017	0.2867	0.0382	0.0000	4.64E-08
156	0.63	0.435	0.041	0.3024	0.0382	0.0000	4.64E-08
157	0.00	0.000	0.197	0.2828	0.0382	0.0000	4.64E-08
158	0.00	0.000	0.024	0.2804	0.0382	0.0000	4.64E-08
159	0.07	0.000	0.044	0.2828	0.0382	0.0000	4.63E-08
160	0.45	0.275	0.042	0.2958	0.0382	0.0000	4.63E-08
161	0.14	0.001	0.078	0.3023	0.0382	0.0000	4.63E-08
162	0.00	0.000	0.119	0.2904	0.0382	0.0000	4.63E-08
163	0.00	0.000	0.088	0.2816	0.0382	0.0000	4.63E-08
164	0.00	0.000	0.032	0.2784	0.0381	0.0000	4.63E-08
165	0.06	0.000	0.030	0.2814	0.0381	0.0000	4.63E-08
166	0.08	0.000	0.028	0.2865	0.0381	0.0000	4.63E-08
167	0.00	0.000	0.019	0.2846	0.0381	0.0000	4.63E-08
168	0.00	0.000	0.021	0.2825	0.0381	0.0000	4.62E-08
169	0.00	0.000	0.024	0.2801	0.0381	0.0000	4.62E-08
170	0.01	0.000	0.031	0.2782	0.0381	0.0000	4.62E-08
171	0.00	0.000	0.005	0.2777	0.0381	0.0000	4.62E-08
172	0.00	0.000	0.006	0.2772	0.0381	0.0000	4.62E-08
173	0.00	0.000	0.001	0.2770	0.0380	0.0000	4.62E-08
174	0.00	0.000	0.000	0.2770	0.0380	0.0000	4.62E-08
175	1.43	1.225	0.042	0.2930	0.0380	0.0000	4.62E-08
176	0.00	0.000	0.104	0.2826	0.0380	0.0000	4.62E-08
177	0.00	0.000	0.020	0.2806	0.0380	0.0000	4.62E-08
178	0.00	0.000	0.023	0.2783	0.0380	0.0000	4.61E-08
179	0.08	0.000	0.032	0.2830	0.0380	0.0000	4.61E-08
180	0.03	0.000	0.025	0.2832	0.0380	0.0000	4.61E-08
181	0.00	0.000	0.015	0.2817	0.0380	0.0000	4.61E-08
182	0.00	0.000	0.012	0.2805	0.0379	0.0000	4.61E-08
183	0.00	0.000	0.016	0.2789	0.0379	0.0000	4.61E-08
184	0.00	0.000	0.006	0.2783	0.0379	0.0000	4.61E-08

185	0.00	0.000	0.005	0.2778	0.0379	0.0000	4.61E-08
186	0.00	0.000	0.004	0.2774	0.0379	0.0000	4.61E-08
187	0.15	0.000	0.028	0.2891	0.0379	0.0000	4.61E-08
188	0.15	0.000	0.033	0.3005	0.0379	0.0000	4.61E-08
189	0.04	0.000	0.144	0.2905	0.0379	0.0000	4.61E-08
190	0.00	0.000	0.018	0.2887	0.0379	0.0000	4.60E-08
191	1.05	0.867	0.037	0.3030	0.0379	0.0000	4.60E-08
192	0.00	0.000	0.167	0.2864	0.0379	0.0000	4.60E-08
193	0.00	0.000	0.073	0.2791	0.0379	0.0000	4.60E-08
194	0.00	0.000	0.018	0.2773	0.0378	0.0000	4.60E-08
195	0.00	0.000	0.002	0.2771	0.0378	0.0000	4.60E-08
196	0.00	0.000	0.001	0.2770	0.0379	0.0000	4.60E-08
197	0.00	0.000	0.000	0.2770	0.0379	0.0000	4.60E-08
198	0.00	0.000	0.000	0.2770	0.0379	0.0000	4.60E-08
199	0.00	0.000	0.000	0.2770	0.0378	0.0000	4.60E-08
200	0.00	0.000	0.000	0.2770	0.0378	0.0000	4.60E-08
201	1.45	1.239	0.047	0.2930	0.0378	0.0000	4.60E-08
202	0.00	0.000	0.114	0.2816	0.0378	0.0000	4.60E-08
203	0.21	0.051	0.048	0.2926	0.0378	0.0000	4.60E-08
204	0.34	0.099	0.261	0.2908	0.0378	0.0000	4.60E-08
205	0.07	0.000	0.139	0.2840	0.0378	0.0000	4.59E-08
206	0.00	0.000	0.038	0.2802	0.0378	0.0000	4.59E-08
207	0.14	0.000	0.052	0.2891	0.0378	0.0000	4.59E-08
208	0.00	0.000	0.030	0.2861	0.0377	0.0000	4.59E-08
209	0.00	0.000	0.026	0.2835	0.0377	0.0000	4.59E-08
210	0.07	0.000	0.049	0.2861	0.0378	0.0000	4.60E-08
211	0.08	0.000	0.045	0.2891	0.0379	0.0000	4.61E-08
212	0.00	0.000	0.023	0.2868	0.0379	0.0000	4.61E-08
213	0.00	0.000	0.023	0.2845	0.0379	0.0000	4.61E-08
214	0.00	0.000	0.024	0.2821	0.0379	0.0000	4.61E-08
215	0.00	0.000	0.025	0.2796	0.0380	0.0000	4.61E-08
216	0.00	0.000	0.020	0.2776	0.0379	0.0000	4.61E-08

217	0.00	0.000	0.005	0.2772	0.0379	0.0000	4.61E-08
218	0.00	0.000	0.001	0.2771	0.0379	0.0000	4.61E-08
219	0.00	0.000	0.001	0.2770	0.0379	0.0000	4.61E-08
220	0.00	0.000	0.000	0.2770	0.0379	0.0000	4.61E-08
221	0.00	0.000	0.000	0.2770	0.0379	0.0000	4.61E-08
222	0.00	0.000	0.000	0.2770	0.0379	0.0000	4.60E-08
223	0.00	0.000	0.000	0.2770	0.0379	0.0000	4.60E-08
224	0.00	0.000	0.000	0.2770	0.0379	0.0000	4.60E-08
225	0.00	0.000	0.000	0.2770	0.0379	0.0000	4.60E-08
226	0.00	0.000	0.000	0.2770	0.0378	0.0000	4.60E-08
227	0.01	0.000	0.011	0.2770	0.0378	0.0000	4.60E-08
228	0.06	0.000	0.022	0.2805	0.0378	0.0000	4.60E-08
229	0.00	0.000	0.002	0.2802	0.0378	0.0000	4.60E-08
230	0.00	0.000	0.011	0.2792	0.0378	0.0000	4.60E-08
231	0.66	0.483	0.040	0.2931	0.0378	0.0000	4.60E-08
232	0.06	0.000	0.032	0.2955	0.0378	0.0000	4.59E-08
233	0.00	0.000	0.016	0.2939	0.0378	0.0000	4.59E-08
234	0.37	0.204	0.043	0.3066	0.0378	0.0000	4.59E-08
235	0.00	0.000	0.115	0.2954	0.0377	0.0000	4.59E-08
236	0.01	0.000	0.019	0.2941	0.0377	0.0000	4.59E-08
237	0.16	0.000	0.038	0.3059	0.0377	0.0000	4.59E-08
238	0.08	0.000	0.042	0.3098	0.0377	0.0000	4.59E-08
239	0.29	0.124	0.095	0.3173	0.0377	0.0000	4.59E-08
240	0.00	0.000	0.066	0.3107	0.0377	0.0000	4.59E-08
241	0.00	0.000	0.062	0.3047	0.0377	0.0000	4.59E-08
242	0.00	0.000	0.063	0.2983	0.0377	0.0000	4.59E-08
243	0.00	0.000	0.078	0.2906	0.0377	0.0000	4.59E-08
244	0.00	0.000	0.060	0.2846	0.0377	0.0000	4.58E-08
245	0.00	0.000	0.046	0.2799	0.0377	0.0000	4.58E-08
246	0.11	0.000	0.050	0.2858	0.0376	0.0000	4.58E-08
247	0.00	0.000	0.025	0.2833	0.0376	0.0000	4.58E-08
248	0.00	0.000	0.034	0.2800	0.0376	0.0000	4.58E-08

249		0.00	0.000	0.019	0.2780	0.0376	0.0000	4.58E-08
250		0.04	0.000	0.029	0.2792	0.0376	0.0000	4.58E-08
251		0.07	0.000	0.027	0.2835	0.0376	0.0000	4.58E-08
252		1.41	1.237	0.049	0.2958	0.0376	0.0000	4.58E-08
253		0.00	0.000	0.077	0.2881	0.0376	0.0000	4.58E-08
254		0.00	0.000	0.069	0.2812	0.0376	0.0000	4.57E-08
255		0.00	0.000	0.025	0.2787	0.0375	0.0000	4.57E-08
256		0.00	0.000	0.010	0.2777	0.0375	0.0000	4.57E-08
257		0.09	0.000	0.033	0.2830	0.0375	0.0000	4.57E-08
258		0.08	0.000	0.043	0.2872	0.0375	0.0000	4.57E-08
259		0.71	0.521	0.069	0.2997	0.0375	0.0000	4.57E-08
260		0.00	0.000	0.080	0.2917	0.0375	0.0000	4.57E-08
261		0.00	0.000	0.095	0.2822	0.0375	0.0000	4.57E-08
262		0.00	0.000	0.041	0.2781	0.0375	0.0000	4.57E-08
263		0.72	0.478	0.097	0.2925	0.0375	0.0000	4.57E-08
264		0.06	0.000	0.108	0.2873	0.0375	0.0000	4.57E-08
265		0.12	0.000	0.105	0.2892	0.0375	0.0000	4.57E-08
266		0.01	0.000	0.082	0.2823	0.0375	0.0000	4.56E-08
267		0.40	0.179	0.088	0.2960	0.0374	0.0000	4.56E-08
268		0.00	0.000	0.109	0.2851	0.0374	0.0000	4.56E-08
269		0.00	0.000	0.048	0.2803	0.0374	0.0000	4.56E-08
270		0.00	0.000	0.025	0.2778	0.0374	0.0000	4.56E-08
271		0.00	0.000	0.006	0.2771	0.0374	0.0000	4.56E-08
272		0.00	0.000	0.001	0.2770	0.0374	0.0000	4.56E-08
273		0.26	0.096	0.039	0.2891	0.0374	0.0000	4.56E-08
274		0.01	0.000	0.026	0.2872	0.0374	0.0000	4.56E-08
275	*	0.00	0.000	0.021	0.2851	0.0374	0.0000	4.56E-08
276		0.00	0.000	0.022	0.2829	0.0374	0.0000	4.55E-08
277		0.00	0.000	0.018	0.2811	0.0373	0.0000	4.55E-08
278		0.00	0.000	0.024	0.2787	0.0373	0.0000	4.55E-08
279		0.00	0.000	0.012	0.2774	0.0373	0.0000	4.55E-08
280		0.09	0.000	0.028	0.2836	0.0373	0.0000	4.55E-08

281	0.00	0.000	0.011	0.2826	0.0373	0.0000	4.55E-08
282	0.00	0.000	0.013	0.2812	0.0373	0.0000	4.55E-08
283	0.00	0.000	0.020	0.2792	0.0373	0.0000	4.55E-08
284	0.61	0.424	0.044	0.2938	0.0373	0.0000	4.55E-08
285	0.00	0.000	0.054	0.2884	0.0373	0.0000	4.55E-08
286	0.00	0.000	0.085	0.2799	0.0372	0.0000	4.55E-08
287	0.71	0.470	0.081	0.2958	0.0372	0.0000	4.54E-08
288	0.03	0.000	0.088	0.2896	0.0372	0.0000	4.54E-08
289	0.00	0.000	0.066	0.2831	0.0372	0.0000	4.54E-08
290	0.01	0.000	0.060	0.2783	0.0372	0.0000	4.54E-08
291	0.15	0.000	0.043	0.2890	0.0372	0.0000	4.54E-08
292	0.05	0.000	0.055	0.2888	0.0372	0.0000	4.54E-08
293	0.16	0.004	0.079	0.2969	0.0372	0.0000	4.54E-08
294	0.00	0.000	0.026	0.2942	0.0372	0.0000	4.54E-08
295	0.49	0.301	0.057	0.3077	0.0371	0.0000	4.54E-08
296	0.04	0.000	0.063	0.3050	0.0371	0.0000	4.53E-08
297	0.00	0.000	0.031	0.3020	0.0371	0.0000	4.53E-08
298	0.00	0.000	0.061	0.2959	0.0371	0.0000	4.54E-08
299	0.00	0.000	0.100	0.2859	0.0371	0.0000	4.53E-08
300	0.00	0.000	0.080	0.2779	0.0371	0.0000	4.53E-08
301	0.00	0.000	0.005	0.2775	0.0371	0.0000	4.53E-08
302	0.00	0.000	0.004	0.2771	0.0371	0.0000	4.53E-08
303	0.00	0.000	0.001	0.2770	0.0371	0.0000	4.53E-08
304	1.44	1.224	0.055	0.2932	0.0371	0.0000	4.53E-08
305	0.00	0.000	0.060	0.2872	0.0371	0.0000	4.53E-08
306	1.06	0.751	0.157	0.3026	0.0371	0.0000	4.53E-08
307	0.03	0.000	0.050	0.3010	0.0371	0.0000	4.53E-08
308	0.88	0.643	0.104	0.3140	0.0370	0.0000	4.53E-08
309	0.19	0.051	0.057	0.3226	0.0370	0.0000	4.52E-08
310	0.00	0.000	0.031	0.3196	0.0370	0.0000	4.52E-08
311	0.00	0.000	0.048	0.3147	0.0370	0.0000	4.52E-08
312	0.00	0.000	0.062	0.3086	0.0370	0.0000	4.53E-08

313		0.00	0.000	0.101	0.2985	0.0370	0.0000	4.52E-08
314		0.00	0.000	0.051	0.2933	0.0370	0.0000	4.52E-08
315		0.19	0.026	0.110	0.2987	0.0370	0.0000	4.52E-08
316		0.02	0.000	0.097	0.2906	0.0370	0.0000	4.52E-08
317		0.03	0.000	0.071	0.2868	0.0370	0.0000	4.52E-08
318		0.57	0.339	0.099	0.3003	0.0377	0.0000	4.59E-08
319		0.20	0.055	0.103	0.3049	0.0381	0.0000	4.63E-08
320		0.00	0.000	0.063	0.2986	0.0381	0.0000	4.62E-08
321		0.00	0.000	0.043	0.2943	0.0381	0.0000	4.62E-08
322		0.00	0.000	0.029	0.2915	0.0381	0.0000	4.62E-08
323		0.12	0.000	0.047	0.2990	0.0381	0.0000	4.62E-08
324		0.21	0.055	0.057	0.3088	0.0380	0.0000	4.62E-08
325	*	0.89	0.000	0.034	0.3108	0.0380	0.0000	4.62E-08
326	*	0.05	0.000	0.018	0.3127	0.0380	0.0000	4.62E-08
327	*	0.00	0.000	0.022	0.3147	0.0380	0.0000	4.62E-08
328	*	0.07	0.000	0.013	0.3167	0.0380	0.0000	4.62E-08
329	*	0.59	0.000	0.009	0.3186	0.0380	0.0000	4.61E-08
330		0.22	0.000	0.000	0.3210	0.0380	0.0000	4.61E-08
331	*	0.00	0.000	0.041	0.3230	0.0380	0.0000	4.61E-08
332		0.00	0.354	0.000	0.3357	0.0380	0.0000	4.61E-08
333	*	0.01	0.000	0.027	0.3377	0.0379	0.0000	4.61E-08
334		0.00	0.316	0.000	0.3504	0.0379	0.0000	4.61E-08
335		0.00	0.421	0.057	0.3620	0.0379	0.0000	4.61E-08
336		0.95	0.800	0.145	0.3624	0.0379	0.0000	4.61E-08
337		0.01	0.000	0.088	0.3543	0.0379	0.0000	4.61E-08
338		0.00	0.000	0.057	0.3486	0.0379	0.0000	4.61E-08
339		0.00	0.000	0.047	0.3439	0.0379	0.0000	4.60E-08
340		0.09	0.000	0.076	0.3452	0.0379	0.0000	4.60E-08
341		0.07	0.000	0.077	0.3442	0.0379	0.0000	4.60E-08
342		0.00	0.000	0.041	0.3401	0.0378	0.0000	4.60E-08
343		0.02	0.000	0.056	0.3362	0.0378	0.0000	4.60E-08
344		0.00	0.000	0.065	0.3297	0.0378	0.0000	4.60E-08

345		0.00	0.000	0.073	0.3224	0.0378	0.0000	4.60E-08
346		0.00	0.000	0.069	0.3156	0.0378	0.0000	4.60E-08
347		0.10	0.000	0.071	0.3185	0.0378	0.0000	4.60E-08
348	*	0.00	0.000	0.026	0.3159	0.0378	0.0000	4.60E-08
349	*	0.00	0.000	0.000	0.3159	0.0379	0.0000	4.60E-08
350	*	0.00	0.000	0.004	0.3159	0.0379	0.0000	4.60E-08
351	*	0.00	0.000	0.000	0.3159	0.0379	0.0000	4.60E-08
352		0.00	0.000	0.041	0.3118	0.0378	0.0000	4.60E-08
353		0.00	0.000	0.078	0.3040	0.0378	0.0000	4.60E-08
354		0.20	0.038	0.094	0.3105	0.0378	0.0000	4.60E-08
355		0.11	0.000	0.083	0.3134	0.0378	0.0000	4.60E-08
356		0.51	0.313	0.063	0.3266	0.0378	0.0000	4.60E-08
357		0.00	0.000	0.037	0.3230	0.0378	0.0000	4.60E-08
358		0.05	0.000	0.057	0.3226	0.0378	0.0000	4.59E-08
359		0.00	0.000	0.062	0.3167	0.0378	0.0000	4.59E-08
360		0.44	0.230	0.068	0.3311	0.0378	0.0000	4.59E-08
361		0.03	0.000	0.083	0.3261	0.0377	0.0000	4.59E-08
362		0.00	0.000	0.135	0.3126	0.0377	0.0000	4.59E-08
363		0.00	0.000	0.090	0.3036	0.0377	0.0000	4.59E-08
364		0.00	0.000	0.098	0.2937	0.0377	0.0000	4.59E-08
365		0.00	0.000	0.105	0.2832	0.0377	0.0000	4.59E-08

* = Frozen (air or soil)

Annual Totals for Year 7			
	inches	cubic feet	percent
Precipitation	41.54	150,782.1	100.00
Runoff	23.595	85,649.9	56.80
Evapotranspiration	18.070	65,594.7	43.50
Recirculation into Layer 1	0.0016	5.6598	0.00
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0016	5.6598	0.00
Percolation/Leakage through Layer 5	0.000017	0.0607	0.00
Average Head on Top of Layer 4	0.0377	---	---
Change in Water Storage	-0.1274	-462.5	-0.31
Soil Water at Start of Year	1,406.6657	5,106,196.3	3386.47
Soil Water at End of Year	1,406.5382	5,105,733.8	3386.17
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0016	-5.6594	0.00

Daily Output for Year 8

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.056	0.2776	0.0377	0.0000	4.59E-08
2			0.00	0.000	0.003	0.2773	0.0377	0.0000	4.59E-08
3			0.00	0.000	0.003	0.2770	0.0377	0.0000	4.58E-08
4			0.00	0.000	0.000	0.2770	0.0377	0.0000	4.58E-08
5			0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08
6			0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08
7			0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08
8			0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08
9			0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08
10			0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08
11			0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08
12			0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08
13			0.00	0.000	0.000	0.2770	0.0376	0.0000	4.57E-08
14			0.00	0.000	0.000	0.2770	0.0376	0.0000	4.57E-08
15	*		0.00	0.000	0.000	0.2770	0.0375	0.0000	4.57E-08
16	*		0.00	0.000	0.000	0.2770	0.0375	0.0000	4.57E-08
17	*		0.00	0.000	0.000	0.2770	0.0375	0.0000	4.57E-08
18	*		0.22	0.000	0.028	0.2790	0.0375	0.0000	4.57E-08
19	*		0.00	0.000	0.021	0.2809	0.0375	0.0000	4.57E-08
20	*		0.09	0.000	0.011	0.2829	0.0375	0.0000	4.57E-08
21	*		0.00	0.000	0.000	0.2849	0.0375	0.0000	4.57E-08
22			0.03	0.022	0.056	0.2976	0.0375	0.0000	4.57E-08
23			0.00	0.000	0.007	0.2969	0.0375	0.0000	4.56E-08
24	*		0.00	0.000	0.011	0.2958	0.0374	0.0000	4.56E-08

25			0.00	0.000	0.010	0.2948	0.0374	0.0000	4.56E-08
26			0.35	0.179	0.037	0.3085	0.0374	0.0000	4.56E-08
27			0.19	0.053	0.031	0.3192	0.0374	0.0000	4.56E-08
28			0.00	0.000	0.026	0.3167	0.0374	0.0000	4.56E-08
29			0.00	0.000	0.041	0.3126	0.0374	0.0000	4.56E-08
30			0.00	0.000	0.108	0.3018	0.0374	0.0000	4.56E-08
31			0.00	0.000	0.040	0.2978	0.0374	0.0000	4.56E-08
32			0.00	0.000	0.045	0.2933	0.0374	0.0000	4.56E-08
33			0.00	0.000	0.026	0.2907	0.0374	0.0000	4.56E-08
34	*		0.00	0.000	0.029	0.2878	0.0374	0.0000	4.56E-08
35	*		0.00	0.000	0.000	0.2878	0.0375	0.0000	4.57E-08
36	*		0.00	0.000	0.000	0.2878	0.0375	0.0000	4.57E-08
37	*		0.00	0.000	0.000	0.2878	0.0375	0.0000	4.57E-08
38			0.00	0.000	0.025	0.2852	0.0375	0.0000	4.57E-08
39			0.00	0.000	0.025	0.2827	0.0375	0.0000	4.57E-08
40	*		0.00	0.000	0.000	0.2827	0.0375	0.0000	4.56E-08
41	*		0.00	0.000	0.000	0.2827	0.0374	0.0000	4.56E-08
42	*	*	0.00	0.000	0.000	0.2827	0.0374	0.0000	4.56E-08
43	*	*	0.00	0.000	0.000	0.2827	0.0374	0.0000	4.56E-08
44		*	0.00	0.000	0.000	0.2827	0.0374	0.0000	4.56E-08
45		*	0.00	0.000	0.000	0.2827	0.0374	0.0000	4.56E-08
46			0.25	0.088	0.045	0.2940	0.0374	0.0000	4.56E-08
47			0.01	0.000	0.031	0.2921	0.0374	0.0000	4.56E-08
48			0.00	0.000	0.022	0.2901	0.0374	0.0000	4.56E-08
49			0.00	0.000	0.019	0.2881	0.0374	0.0000	4.56E-08
50			0.00	0.000	0.019	0.2862	0.0373	0.0000	4.55E-08
51	*		0.00	0.000	0.000	0.2862	0.0373	0.0000	4.55E-08
52			0.00	0.000	0.018	0.2844	0.0373	0.0000	4.55E-08
53	*		0.12	0.000	0.061	0.2863	0.0373	0.0000	4.55E-08
54	*		0.00	0.000	0.045	0.2854	0.0373	0.0000	4.55E-08
55	*		0.00	0.000	0.000	0.2854	0.0373	0.0000	4.55E-08
56	*		0.00	0.000	0.000	0.2854	0.0373	0.0000	4.55E-08

57	*	0.00	0.000	0.014	0.2840	0.0373	0.0000	4.55E-08
58	*	0.00	0.000	0.012	0.2827	0.0373	0.0000	4.55E-08
59		0.79	0.603	0.038	0.2976	0.0372	0.0000	4.55E-08
60		0.00	0.000	0.044	0.2932	0.0372	0.0000	4.54E-08
61		0.00	0.000	0.095	0.2837	0.0372	0.0000	4.54E-08
62		0.00	0.000	0.042	0.2795	0.0372	0.0000	4.54E-08
63		0.00	0.000	0.013	0.2783	0.0372	0.0000	4.54E-08
64		0.00	0.000	0.009	0.2773	0.0372	0.0000	4.54E-08
65		0.00	0.000	0.002	0.2771	0.0372	0.0000	4.54E-08
66		0.00	0.000	0.001	0.2770	0.0375	0.0000	4.57E-08
67	*	0.00	0.000	0.000	0.2770	0.0378	0.0000	4.60E-08
68		0.00	0.000	0.000	0.2770	0.0378	0.0000	4.60E-08
69		0.00	0.000	0.000	0.2770	0.0378	0.0000	4.59E-08
70		0.27	0.111	0.031	0.2896	0.0378	0.0000	4.59E-08
71		0.62	0.463	0.044	0.3012	0.0378	0.0000	4.59E-08
72	*	0.10	0.000	0.061	0.3032	0.0377	0.0000	4.59E-08
73	*	0.34	0.000	0.018	0.3052	0.0377	0.0000	4.59E-08
74	*	0.11	0.000	0.011	0.3071	0.0377	0.0000	4.59E-08
75	*	1.30	0.000	0.000	0.3091	0.0377	0.0000	4.59E-08
76		0.00	0.028	0.034	0.3218	0.0377	0.0000	4.59E-08
77		0.00	0.179	0.013	0.3334	0.0377	0.0000	4.59E-08
78	*	0.82	0.000	0.028	0.3354	0.0377	0.0000	4.59E-08
79	*	0.22	0.000	0.018	0.3374	0.0377	0.0000	4.58E-08
80	*	0.00	0.000	0.014	0.3394	0.0377	0.0000	4.58E-08
81		0.00	0.000	0.000	0.3414	0.0376	0.0000	4.58E-08
82		0.00	1.955	0.000	0.3541	0.0376	0.0000	4.58E-08
83		0.00	0.000	0.119	0.3423	0.0376	0.0000	4.58E-08
84	*	0.00	0.000	0.073	0.3349	0.0376	0.0000	4.58E-08
85		0.00	0.000	0.086	0.3263	0.0376	0.0000	4.58E-08
86		0.00	0.000	0.045	0.3218	0.0376	0.0000	4.58E-08
87		0.00	0.000	0.079	0.3139	0.0376	0.0000	4.58E-08
88		0.00	0.000	0.147	0.2991	0.0376	0.0000	4.58E-08

89		0.00	0.000	0.126	0.2866	0.0376	0.0000	4.57E-08
90		0.00	0.000	0.052	0.2813	0.0375	0.0000	4.57E-08
91		0.00	0.000	0.037	0.2776	0.0376	0.0000	4.58E-08
92		0.49	0.279	0.057	0.2926	0.0377	0.0000	4.59E-08
93		0.66	0.390	0.153	0.3042	0.0378	0.0000	4.60E-08
94		0.06	0.000	0.067	0.3034	0.0380	0.0000	4.61E-08
95		0.11	0.000	0.096	0.3049	0.0380	0.0000	4.61E-08
96		0.02	0.000	0.173	0.2901	0.0380	0.0000	4.61E-08
97		0.00	0.000	0.091	0.2810	0.0380	0.0000	4.61E-08
98		0.00	0.000	0.033	0.2777	0.0379	0.0000	4.61E-08
99		0.00	0.000	0.005	0.2772	0.0382	0.0000	4.63E-08
100		0.00	0.000	0.001	0.2770	0.0384	0.0000	4.65E-08
101		0.00	0.000	0.000	0.2770	0.0384	0.0000	4.65E-08
102		0.00	0.000	0.000	0.2770	0.0384	0.0000	4.65E-08
103		0.00	0.000	0.000	0.2770	0.0384	0.0000	4.65E-08
104		0.32	0.143	0.046	0.2903	0.0384	0.0000	4.65E-08
105		0.28	0.120	0.044	0.3019	0.0383	0.0000	4.65E-08
106		0.00	0.000	0.043	0.2977	0.0383	0.0000	4.65E-08
107		0.00	0.000	0.014	0.2962	0.0383	0.0000	4.64E-08
108		0.26	0.096	0.039	0.3089	0.0383	0.0000	4.64E-08
109		0.74	0.482	0.138	0.3205	0.0383	0.0000	4.64E-08
110		0.07	0.000	0.156	0.3121	0.0383	0.0000	4.64E-08
111		0.05	0.000	0.205	0.2968	0.0383	0.0000	4.64E-08
112		0.00	0.000	0.106	0.2862	0.0383	0.0000	4.64E-08
113		0.00	0.000	0.046	0.2816	0.0384	0.0000	4.65E-08
114		0.00	0.000	0.033	0.2783	0.0385	0.0000	4.67E-08
115		0.00	0.000	0.010	0.2773	0.0385	0.0000	4.66E-08
116		0.00	0.000	0.003	0.2771	0.0385	0.0000	4.66E-08
117	*	0.14	0.000	0.108	0.2790	0.0385	0.0000	4.66E-08
118		0.00	0.000	0.015	0.2787	0.0385	0.0000	4.66E-08
119		0.00	0.000	0.005	0.2782	0.0385	0.0000	4.66E-08
120		0.28	0.113	0.044	0.2911	0.0385	0.0000	4.66E-08

121	0.00	0.000	0.010	0.2901	0.0385	0.0000	4.66E-08
122	0.00	0.000	0.014	0.2887	0.0385	0.0000	4.66E-08
123	0.00	0.000	0.014	0.2872	0.0384	0.0000	4.66E-08
124	0.00	0.000	0.013	0.2859	0.0384	0.0000	4.66E-08
125	0.06	0.000	0.033	0.2882	0.0384	0.0000	4.65E-08
126	0.03	0.000	0.029	0.2879	0.0384	0.0000	4.65E-08
127	0.00	0.000	0.013	0.2865	0.0384	0.0000	4.65E-08
128	0.00	0.000	0.010	0.2856	0.0384	0.0000	4.65E-08
129	0.00	0.000	0.011	0.2844	0.0384	0.0000	4.65E-08
130	0.00	0.000	0.012	0.2832	0.0384	0.0000	4.65E-08
131	0.19	0.046	0.033	0.2947	0.0384	0.0000	4.65E-08
132	0.31	0.153	0.039	0.3062	0.0383	0.0000	4.65E-08
133	0.22	0.062	0.149	0.3072	0.0383	0.0000	4.65E-08
134	0.01	0.000	0.069	0.3017	0.0383	0.0000	4.65E-08
135	0.00	0.000	0.089	0.2928	0.0383	0.0000	4.64E-08
136	0.00	0.000	0.046	0.2881	0.0383	0.0000	4.64E-08
137	0.00	0.000	0.037	0.2844	0.0383	0.0000	4.64E-08
138	1.60	1.378	0.058	0.3006	0.0383	0.0000	4.64E-08
139	0.00	0.000	0.148	0.2859	0.0383	0.0000	4.64E-08
140	0.00	0.000	0.054	0.2805	0.0384	0.0000	4.65E-08
141	2.67	2.357	0.154	0.2966	0.0384	0.0000	4.65E-08
142	0.14	0.000	0.122	0.2985	0.0384	0.0000	4.65E-08
143	0.00	0.000	0.087	0.2898	0.0383	0.0000	4.65E-08
144	0.88	0.548	0.188	0.3043	0.0383	0.0000	4.65E-08
145	0.00	0.000	0.198	0.2845	0.0386	0.0000	4.67E-08
146	0.00	0.000	0.059	0.2786	0.0390	0.0000	4.70E-08
147	0.00	0.000	0.013	0.2772	0.0389	0.0000	4.70E-08
148	0.00	0.000	0.002	0.2771	0.0389	0.0000	4.70E-08
149	0.03	0.000	0.021	0.2780	0.0389	0.0000	4.70E-08
150	0.00	0.000	0.003	0.2776	0.0389	0.0000	4.70E-08
151	0.00	0.000	0.005	0.2771	0.0389	0.0000	4.70E-08
152	0.00	0.000	0.001	0.2771	0.0389	0.0000	4.70E-08

153	0.08	0.000	0.024	0.2822	0.0389	0.0000	4.70E-08
154	0.00	0.000	0.011	0.2810	0.0389	0.0000	4.70E-08
155	0.00	0.000	0.016	0.2794	0.0389	0.0000	4.70E-08
156	0.00	0.000	0.010	0.2784	0.0388	0.0000	4.69E-08
157	0.00	0.000	0.005	0.2779	0.0388	0.0000	4.69E-08
158	0.24	0.088	0.031	0.2900	0.0388	0.0000	4.69E-08
159	0.00	0.000	0.010	0.2890	0.0388	0.0000	4.69E-08
160	0.00	0.000	0.015	0.2875	0.0388	0.0000	4.69E-08
161	0.00	0.000	0.015	0.2860	0.0388	0.0000	4.69E-08
162	1.09	0.900	0.042	0.3007	0.0388	0.0000	4.69E-08
163	0.09	0.000	0.159	0.2941	0.0388	0.0000	4.69E-08
164	0.00	0.000	0.100	0.2841	0.0388	0.0000	4.69E-08
165	0.00	0.000	0.050	0.2791	0.0387	0.0000	4.68E-08
166	0.00	0.000	0.011	0.2780	0.0387	0.0000	4.68E-08
167	0.00	0.000	0.008	0.2772	0.0387	0.0000	4.68E-08
168	0.00	0.000	0.002	0.2770	0.0387	0.0000	4.68E-08
169	0.00	0.000	0.000	0.2770	0.0387	0.0000	4.68E-08
170	0.00	0.000	0.000	0.2770	0.0387	0.0000	4.68E-08
171	0.63	0.414	0.050	0.2931	0.0387	0.0000	4.68E-08
172	0.00	0.000	0.012	0.2919	0.0387	0.0000	4.68E-08
173	0.00	0.000	0.020	0.2899	0.0387	0.0000	4.68E-08
174	0.00	0.000	0.019	0.2881	0.0386	0.0000	4.68E-08
175	0.00	0.000	0.018	0.2862	0.0386	0.0000	4.67E-08
176	0.00	0.000	0.018	0.2844	0.0386	0.0000	4.67E-08
177	3.49	3.300	0.043	0.2995	0.0386	0.0000	4.67E-08
178	0.04	0.000	0.150	0.2885	0.0386	0.0000	4.67E-08
179	0.40	0.129	0.270	0.2884	0.0386	0.0000	4.67E-08
180	0.49	0.235	0.142	0.2996	0.0386	0.0000	4.67E-08
181	1.95	1.691	0.146	0.3108	0.0386	0.0000	4.67E-08
182	1.48	1.246	0.121	0.3221	0.0386	0.0000	4.67E-08
183	0.00	0.000	0.122	0.3099	0.0385	0.0000	4.67E-08
184	0.00	0.000	0.260	0.2839	0.0385	0.0000	4.66E-08

185	0.00	0.000	0.060	0.2779	0.0385	0.0000	4.66E-08
186	0.04	0.000	0.038	0.2781	0.0385	0.0000	4.66E-08
187	0.00	0.000	0.007	0.2774	0.0385	0.0000	4.66E-08
188	0.26	0.104	0.042	0.2893	0.0385	0.0000	4.66E-08
189	0.00	0.000	0.019	0.2873	0.0385	0.0000	4.66E-08
190	0.00	0.000	0.029	0.2845	0.0385	0.0000	4.66E-08
191	0.00	0.000	0.023	0.2822	0.0385	0.0000	4.66E-08
192	0.57	0.368	0.052	0.2975	0.0384	0.0000	4.66E-08
193	0.00	0.000	0.081	0.2893	0.0384	0.0000	4.66E-08
194	0.00	0.000	0.021	0.2872	0.0384	0.0000	4.65E-08
195	0.00	0.000	0.025	0.2847	0.0384	0.0000	4.65E-08
196	0.04	0.000	0.043	0.2842	0.0384	0.0000	4.66E-08
197	0.00	0.000	0.023	0.2820	0.0384	0.0000	4.66E-08
198	0.00	0.000	0.029	0.2791	0.0384	0.0000	4.66E-08
199	0.00	0.000	0.009	0.2782	0.0384	0.0000	4.65E-08
200	0.00	0.000	0.007	0.2775	0.0386	0.0000	4.67E-08
201	0.00	0.000	0.004	0.2771	0.0387	0.0000	4.68E-08
202	0.00	0.000	0.001	0.2771	0.0387	0.0000	4.68E-08
203	0.00	0.000	0.000	0.2770	0.0387	0.0000	4.68E-08
204	0.00	0.000	0.000	0.2770	0.0387	0.0000	4.68E-08
205	0.00	0.000	0.000	0.2770	0.0387	0.0000	4.68E-08
206	0.00	0.000	0.000	0.2770	0.0387	0.0000	4.68E-08
207	0.00	0.000	0.000	0.2770	0.0386	0.0000	4.68E-08
208	0.00	0.000	0.000	0.2770	0.0386	0.0000	4.67E-08
209	0.00	0.000	0.000	0.2770	0.0386	0.0000	4.67E-08
210	0.00	0.000	0.000	0.2770	0.0386	0.0000	4.67E-08
211	0.00	0.000	0.000	0.2770	0.0386	0.0000	4.67E-08
212	0.00	0.000	0.000	0.2770	0.0386	0.0000	4.67E-08
213	0.00	0.000	0.000	0.2770	0.0386	0.0000	4.67E-08
214	0.00	0.000	0.000	0.2770	0.0386	0.0000	4.67E-08
215	0.00	0.000	0.000	0.2770	0.0386	0.0000	4.67E-08
216	0.00	0.000	0.000	0.2770	0.0385	0.0000	4.67E-08

217	0.00	0.000	0.000	0.2770	0.0385	0.0000	4.67E-08
218	0.00	0.000	0.000	0.2770	0.0385	0.0000	4.66E-08
219	0.00	0.000	0.000	0.2770	0.0385	0.0000	4.66E-08
220	0.00	0.000	0.000	0.2770	0.0385	0.0000	4.66E-08
221	0.00	0.000	0.002	0.2770	0.0385	0.0000	4.66E-08
222	0.00	0.000	0.000	0.2770	0.0385	0.0000	4.66E-08
223	0.00	0.000	0.000	0.2770	0.0385	0.0000	4.66E-08
224	0.00	0.000	0.000	0.2770	0.0385	0.0000	4.66E-08
225	0.00	0.000	0.000	0.2770	0.0385	0.0000	4.66E-08
226	0.14	0.000	0.025	0.2887	0.0384	0.0000	4.66E-08
227	0.13	0.000	0.034	0.2983	0.0384	0.0000	4.66E-08
228	0.00	0.000	0.012	0.2971	0.0384	0.0000	4.65E-08
229	0.40	0.236	0.044	0.3095	0.0384	0.0000	4.65E-08
230	0.15	0.007	0.040	0.3196	0.0384	0.0000	4.65E-08
231	3.06	2.691	0.256	0.3305	0.0384	0.0000	4.65E-08
232	0.01	0.000	0.199	0.3119	0.0384	0.0000	4.65E-08
233	0.00	0.000	0.116	0.3003	0.0384	0.0000	4.65E-08
234	0.06	0.000	0.076	0.2983	0.0384	0.0000	4.65E-08
235	0.00	0.000	0.048	0.2935	0.0383	0.0000	4.65E-08
236	0.00	0.000	0.039	0.2896	0.0383	0.0000	4.65E-08
237	0.00	0.000	0.038	0.2858	0.0383	0.0000	4.65E-08
238	0.67	0.456	0.061	0.3008	0.0383	0.0000	4.64E-08
239	0.00	0.000	0.096	0.2911	0.0383	0.0000	4.64E-08
240	0.01	0.000	0.080	0.2840	0.0383	0.0000	4.64E-08
241	0.00	0.000	0.059	0.2781	0.0383	0.0000	4.64E-08
242	0.00	0.000	0.005	0.2775	0.0383	0.0000	4.64E-08
243	0.00	0.000	0.003	0.2773	0.0383	0.0000	4.64E-08
244	0.00	0.000	0.002	0.2771	0.0382	0.0000	4.64E-08
245	0.00	0.000	0.001	0.2770	0.0382	0.0000	4.64E-08
246	0.00	0.000	0.000	0.2770	0.0382	0.0000	4.64E-08
247	0.00	0.000	0.000	0.2770	0.0382	0.0000	4.64E-08
248	0.00	0.000	0.000	0.2770	0.0382	0.0000	4.63E-08

249	0.00	0.000	0.000	0.2770	0.0382	0.0000	4.63E-08
250	0.00	0.000	0.000	0.2770	0.0382	0.0000	4.63E-08
251	0.00	0.000	0.000	0.2770	0.0382	0.0000	4.63E-08
252	0.00	0.000	0.000	0.2770	0.0382	0.0000	4.63E-08
253	0.00	0.000	0.000	0.2770	0.0381	0.0000	4.63E-08
254	0.00	0.000	0.000	0.2770	0.0381	0.0000	4.63E-08
255	0.00	0.000	0.000	0.2770	0.0381	0.0000	4.63E-08
256	0.48	0.283	0.043	0.2921	0.0381	0.0000	4.63E-08
257	0.02	0.000	0.023	0.2922	0.0381	0.0000	4.63E-08
258	0.08	0.000	0.036	0.2967	0.0381	0.0000	4.62E-08
259	0.00	0.000	0.016	0.2952	0.0381	0.0000	4.62E-08
260	0.00	0.000	0.015	0.2936	0.0381	0.0000	4.62E-08
261	0.46	0.276	0.047	0.3074	0.0381	0.0000	4.62E-08
262	0.08	0.000	0.148	0.3002	0.0381	0.0000	4.62E-08
263	0.90	0.736	0.046	0.3123	0.0380	0.0000	4.62E-08
264	0.00	0.000	0.055	0.3068	0.0380	0.0000	4.62E-08
265	0.00	0.000	0.064	0.3004	0.0380	0.0000	4.62E-08
266	0.00	0.000	0.198	0.2807	0.0381	0.0000	4.62E-08
267	0.00	0.000	0.029	0.2778	0.0381	0.0000	4.62E-08
268	0.00	0.000	0.007	0.2771	0.0380	0.0000	4.62E-08
269	0.00	0.000	0.001	0.2770	0.0382	0.0000	4.64E-08
270	0.05	0.000	0.025	0.2799	0.0388	0.0000	4.69E-08
271	0.00	0.000	0.003	0.2796	0.0388	0.0000	4.69E-08
272	0.48	0.282	0.053	0.2937	0.0388	0.0000	4.69E-08
273	0.03	0.000	0.030	0.2942	0.0387	0.0000	4.69E-08
274	0.04	0.000	0.037	0.2945	0.0387	0.0000	4.68E-08
275	0.00	0.000	0.015	0.2930	0.0387	0.0000	4.68E-08
276	0.00	0.000	0.017	0.2913	0.0387	0.0000	4.68E-08
277	0.00	0.000	0.015	0.2898	0.0387	0.0000	4.68E-08
278	0.00	0.000	0.014	0.2884	0.0387	0.0000	4.68E-08
279	0.00	0.000	0.013	0.2871	0.0387	0.0000	4.68E-08
280	0.00	0.000	0.012	0.2859	0.0387	0.0000	4.68E-08

281		0.25	0.088	0.036	0.2982	0.0387	0.0000	4.68E-08
282		0.00	0.000	0.049	0.2933	0.0387	0.0000	4.68E-08
283		0.00	0.000	0.012	0.2921	0.0386	0.0000	4.67E-08
284		0.23	0.082	0.035	0.3038	0.0386	0.0000	4.67E-08
285		0.00	0.000	0.042	0.2995	0.0386	0.0000	4.67E-08
286		0.00	0.000	0.082	0.2914	0.0386	0.0000	4.67E-08
287		0.00	0.000	0.088	0.2826	0.0386	0.0000	4.67E-08
288		0.00	0.000	0.038	0.2787	0.0386	0.0000	4.67E-08
289		0.00	0.000	0.014	0.2774	0.0386	0.0000	4.67E-08
290		0.00	0.000	0.003	0.2771	0.0386	0.0000	4.67E-08
291		0.00	0.000	0.000	0.2770	0.0385	0.0000	4.67E-08
292		0.00	0.000	0.000	0.2770	0.0385	0.0000	4.67E-08
293		0.23	0.070	0.035	0.2895	0.0385	0.0000	4.66E-08
294		0.00	0.000	0.010	0.2885	0.0385	0.0000	4.66E-08
295		0.48	0.288	0.047	0.3030	0.0385	0.0000	4.66E-08
296		0.13	0.002	0.081	0.3076	0.0385	0.0000	4.66E-08
297		0.00	0.000	0.029	0.3048	0.0385	0.0000	4.66E-08
298		0.18	0.021	0.100	0.3109	0.0385	0.0000	4.66E-08
299		0.00	0.000	0.046	0.3063	0.0385	0.0000	4.66E-08
300		0.12	0.000	0.074	0.3109	0.0384	0.0000	4.66E-08
301	*	0.92	0.000	0.028	0.3129	0.0384	0.0000	4.66E-08
302	*	0.00	0.000	0.035	0.3149	0.0384	0.0000	4.65E-08
303	*	0.00	0.000	0.039	0.3168	0.0384	0.0000	4.65E-08
304	*	0.04	0.000	0.021	0.3188	0.0384	0.0000	4.65E-08
305	*	0.00	0.000	0.028	0.3208	0.0384	0.0000	4.65E-08
306	*	0.00	0.000	0.031	0.3227	0.0384	0.0000	4.65E-08
307	*	0.00	0.000	0.018	0.3247	0.0384	0.0000	4.65E-08
308	*	0.00	0.000	0.011	0.3267	0.0384	0.0000	4.65E-08
309	*	0.00	0.000	0.008	0.3286	0.0383	0.0000	4.65E-08
310	*	0.00	0.000	0.005	0.3306	0.0383	0.0000	4.65E-08
311	*	0.00	0.000	0.000	0.3326	0.0383	0.0000	4.65E-08
312	*	0.00	0.000	0.029	0.3345	0.0383	0.0000	4.64E-08

313			0.00	0.036	0.025	0.3473	0.0383	0.0000	4.64E-08
314			0.00	0.139	0.023	0.3589	0.0383	0.0000	4.64E-08
315			0.00	0.000	0.030	0.3559	0.0383	0.0000	4.64E-08
316			0.00	0.000	0.055	0.3504	0.0383	0.0000	4.64E-08
317			1.21	0.993	0.077	0.3642	0.0383	0.0000	4.64E-08
318			0.00	0.000	0.042	0.3600	0.0382	0.0000	4.64E-08
319			0.00	0.000	0.077	0.3524	0.0382	0.0000	4.64E-08
320			0.16	0.012	0.090	0.3583	0.0382	0.0000	4.64E-08
321			0.00	0.000	0.054	0.3530	0.0382	0.0000	4.63E-08
322	*		0.00	0.000	0.026	0.3504	0.0382	0.0000	4.63E-08
323			0.00	0.000	0.048	0.3456	0.0382	0.0000	4.63E-08
324			0.01	0.000	0.122	0.3348	0.0382	0.0000	4.63E-08
325			0.11	0.000	0.109	0.3354	0.0382	0.0000	4.63E-08
326			0.13	0.000	0.093	0.3392	0.0382	0.0000	4.63E-08
327			0.60	0.410	0.061	0.3521	0.0381	0.0000	4.63E-08
328	*		0.00	0.000	0.000	0.3521	0.0381	0.0000	4.63E-08
329	*		0.01	0.000	0.010	0.3521	0.0381	0.0000	4.63E-08
330	*	*	1.11	0.000	0.010	0.3521	0.0381	0.0000	4.63E-08
331	*	*	0.00	0.000	0.007	0.3521	0.0381	0.0000	4.62E-08
332		*	0.00	0.000	0.000	0.3521	0.0381	0.0000	4.62E-08
333	*	*	0.53	0.000	0.022	0.3521	0.0381	0.0000	4.62E-08
334	*	*	0.20	0.000	0.000	0.3521	0.0381	0.0000	4.62E-08
335		*	0.00	0.000	0.000	0.3521	0.0381	0.0000	4.62E-08
336		*	0.03	0.482	0.000	0.3536	0.0380	0.0000	4.62E-08
337		*	0.05	1.101	0.000	0.3536	0.0380	0.0000	4.62E-08
338		*	0.22	0.498	0.009	0.3536	0.0380	0.0000	4.62E-08
339	*	*	0.38	0.000	0.030	0.3536	0.0380	0.0000	4.62E-08
340		*	0.00	0.313	0.042	0.3536	0.0380	0.0000	4.62E-08
341			0.00	0.000	0.038	0.3498	0.0380	0.0000	4.61E-08
342			0.00	0.000	0.050	0.3449	0.0380	0.0000	4.61E-08
343			0.00	0.000	0.053	0.3400	0.0380	0.0000	4.61E-08
344			0.00	0.000	0.066	0.3334	0.0380	0.0000	4.61E-08

345		0.00	0.000	0.081	0.3254	0.0379	0.0000	4.61E-08
346		0.00	0.000	0.050	0.3204	0.0379	0.0000	4.61E-08
347	*	0.00	0.000	0.027	0.3177	0.0379	0.0000	4.61E-08
348	*	0.00	0.000	0.025	0.3152	0.0379	0.0000	4.61E-08
349	*	0.00	0.000	0.021	0.3131	0.0379	0.0000	4.61E-08
350	*	0.00	0.000	0.000	0.3131	0.0379	0.0000	4.60E-08
351	*	0.00	0.000	0.000	0.3131	0.0379	0.0000	4.60E-08
352	*	0.00	0.000	0.023	0.3108	0.0379	0.0000	4.60E-08
353	*	0.00	0.000	0.022	0.3087	0.0379	0.0000	4.60E-08
354	*	0.00	0.000	0.000	0.3087	0.0378	0.0000	4.60E-08
355		0.00	0.000	0.037	0.3050	0.0378	0.0000	4.60E-08
356		0.00	0.000	0.027	0.3023	0.0378	0.0000	4.60E-08
357	*	0.00	0.000	0.028	0.2995	0.0378	0.0000	4.60E-08
358		1.18	0.957	0.057	0.3158	0.0378	0.0000	4.60E-08
359		0.43	0.243	0.069	0.3274	0.0378	0.0000	4.60E-08
360		0.00	0.000	0.054	0.3220	0.0378	0.0000	4.59E-08
361		0.00	0.000	0.065	0.3156	0.0378	0.0000	4.59E-08
362		0.00	0.000	0.068	0.3088	0.0378	0.0000	4.59E-08
363		0.00	0.000	0.051	0.3037	0.0377	0.0000	4.59E-08
364		0.00	0.000	0.039	0.2999	0.0377	0.0000	4.59E-08
365		0.00	0.000	0.040	0.2958	0.0377	0.0000	4.59E-08

* = Frozen (air or soil)

Annual Totals for Year 8			
	inches	cubic feet	percent
Precipitation	42.55	154,465.4	100.00
Runoff	29.024	105,357.3	68.21
Evapotranspiration	13.402	48,649.6	31.50
Recirculation into Layer 1	0.0016	5.7473	0.00
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0016	5.7473	0.00
Percolation/Leakage through Layer 5	0.000017	0.0615	0.00
Average Head on Top of Layer 4	0.0382	---	---
Change in Water Storage	0.1263	458.4	0.30
Soil Water at Start of Year	1,406.5382	5,105,733.8	3305.42
Soil Water at End of Year	1,406.6645	5,106,192.1	3305.72
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0016	-5.7473	0.00

Daily Output for Year 9

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.000	0.2958	0.0377	0.0000	4.59E-08
2	*		0.00	0.000	0.000	0.2958	0.0377	0.0000	4.59E-08
3	*		0.00	0.000	0.000	0.2958	0.0377	0.0000	4.59E-08
4	*		0.00	0.000	0.000	0.2958	0.0377	0.0000	4.58E-08
5			0.32	0.137	0.060	0.3085	0.0377	0.0000	4.58E-08
6	*		0.00	0.000	0.000	0.3085	0.0376	0.0000	4.58E-08
7			0.00	0.000	0.052	0.3033	0.0376	0.0000	4.58E-08
8			0.00	0.000	0.056	0.2977	0.0376	0.0000	4.58E-08
9			0.00	0.000	0.071	0.2906	0.0376	0.0000	4.58E-08
10			0.37	0.159	0.082	0.3038	0.0376	0.0000	4.58E-08
11			0.09	0.000	0.068	0.3060	0.0376	0.0000	4.58E-08
12			0.00	0.000	0.030	0.3030	0.0376	0.0000	4.58E-08
13			0.00	0.000	0.066	0.2964	0.0376	0.0000	4.57E-08
14			0.36	0.125	0.090	0.3106	0.0376	0.0000	4.57E-08
15			0.00	0.000	0.082	0.3024	0.0375	0.0000	4.57E-08
16			0.00	0.000	0.103	0.2921	0.0375	0.0000	4.57E-08
17			0.00	0.000	0.090	0.2831	0.0375	0.0000	4.57E-08
18			0.08	0.000	0.068	0.2841	0.0375	0.0000	4.57E-08
19	*		0.09	0.000	0.050	0.2861	0.0375	0.0000	4.57E-08
20			0.00	0.000	0.063	0.2819	0.0375	0.0000	4.57E-08
21			0.00	0.000	0.030	0.2788	0.0375	0.0000	4.57E-08
22			0.00	0.000	0.013	0.2776	0.0375	0.0000	4.57E-08
23	*		0.00	0.000	0.004	0.2772	0.0375	0.0000	4.56E-08
24			0.00	0.000	0.001	0.2771	0.0374	0.0000	4.56E-08

25		0.01	0.000	0.006	0.2770	0.0374	0.0000	4.56E-08
26		0.00	0.000	0.000	0.2770	0.0374	0.0000	4.56E-08
27		0.00	0.000	0.000	0.2770	0.0374	0.0000	4.56E-08
28		0.00	0.000	0.000	0.2770	0.0374	0.0000	4.56E-08
29		0.00	0.000	0.000	0.2770	0.0374	0.0000	4.56E-08
30		0.00	0.000	0.000	0.2770	0.0374	0.0000	4.56E-08
31		0.00	0.000	0.000	0.2770	0.0374	0.0000	4.56E-08
32		0.00	0.000	0.000	0.2770	0.0374	0.0000	4.56E-08
33		0.00	0.000	0.000	0.2770	0.0374	0.0000	4.56E-08
34		0.00	0.000	0.004	0.2770	0.0374	0.0000	4.56E-08
35		0.00	0.000	0.004	0.2770	0.0373	0.0000	4.55E-08
36	*	0.00	0.000	0.000	0.2770	0.0373	0.0000	4.55E-08
37	*	0.00	0.000	0.000	0.2770	0.0373	0.0000	4.55E-08
38		0.00	0.000	0.000	0.2770	0.0373	0.0000	4.55E-08
39		0.00	0.000	0.000	0.2770	0.0373	0.0000	4.55E-08
40		0.03	0.000	0.019	0.2783	0.0373	0.0000	4.55E-08
41		0.00	0.000	0.001	0.2782	0.0373	0.0000	4.55E-08
42		0.02	0.000	0.017	0.2788	0.0373	0.0000	4.55E-08
43		0.08	0.000	0.024	0.2843	0.0373	0.0000	4.55E-08
44		0.06	0.000	0.027	0.2875	0.0373	0.0000	4.55E-08
45		0.00	0.000	0.007	0.2868	0.0372	0.0000	4.54E-08
46	*	0.00	0.000	0.008	0.2860	0.0372	0.0000	4.54E-08
47		0.00	0.000	0.008	0.2852	0.0372	0.0000	4.54E-08
48		0.00	0.000	0.009	0.2843	0.0372	0.0000	4.54E-08
49		0.00	0.000	0.009	0.2834	0.0372	0.0000	4.54E-08
50		0.02	0.000	0.023	0.2834	0.0372	0.0000	4.54E-08
51	*	0.00	0.000	0.000	0.2834	0.0372	0.0000	4.54E-08
52		0.00	0.000	0.008	0.2826	0.0372	0.0000	4.54E-08
53		0.00	0.000	0.008	0.2817	0.0372	0.0000	4.54E-08
54		0.00	0.000	0.008	0.2809	0.0372	0.0000	4.54E-08
55		0.05	0.000	0.028	0.2826	0.0371	0.0000	4.53E-08
56		0.00	0.000	0.007	0.2819	0.0371	0.0000	4.53E-08

57		0.50	0.332	0.034	0.2956	0.0371	0.0000	4.53E-08
58		0.21	0.073	0.029	0.3068	0.0371	0.0000	4.53E-08
59		0.02	0.000	0.092	0.2998	0.0371	0.0000	4.53E-08
60		0.00	0.000	0.007	0.2991	0.0371	0.0000	4.53E-08
61		0.00	0.000	0.007	0.2983	0.0371	0.0000	4.53E-08
62		0.00	0.000	0.007	0.2976	0.0371	0.0000	4.53E-08
63	*	0.00	0.000	0.007	0.2969	0.0371	0.0000	4.53E-08
64	*	0.00	0.000	0.007	0.2962	0.0371	0.0000	4.53E-08
65		0.00	0.000	0.007	0.2955	0.0371	0.0000	4.53E-08
66		0.00	0.000	0.007	0.2948	0.0371	0.0000	4.53E-08
67		0.00	0.000	0.007	0.2942	0.0371	0.0000	4.53E-08
68		0.00	0.000	0.008	0.2934	0.0370	0.0000	4.53E-08
69		0.00	0.000	0.008	0.2926	0.0370	0.0000	4.52E-08
70		0.00	0.000	0.008	0.2918	0.0370	0.0000	4.52E-08
71		0.00	0.000	0.008	0.2910	0.0370	0.0000	4.52E-08
72		0.00	0.000	0.008	0.2902	0.0370	0.0000	4.52E-08
73		0.00	0.000	0.008	0.2894	0.0370	0.0000	4.52E-08
74		0.00	0.000	0.008	0.2887	0.0370	0.0000	4.52E-08
75		0.00	0.000	0.008	0.2879	0.0370	0.0000	4.52E-08
76		0.42	0.236	0.032	0.3030	0.0370	0.0000	4.52E-08
77		0.00	0.000	0.080	0.2950	0.0370	0.0000	4.52E-08
78		0.00	0.000	0.008	0.2942	0.0369	0.0000	4.52E-08
79		0.43	0.246	0.032	0.3096	0.0369	0.0000	4.52E-08
80		0.00	0.000	0.061	0.3036	0.0369	0.0000	4.51E-08
81	*	1.12	0.000	0.050	0.3056	0.0369	0.0000	4.51E-08
82	*	0.31	0.000	0.017	0.3076	0.0369	0.0000	4.51E-08
83	*	0.00	0.000	0.044	0.3095	0.0369	0.0000	4.51E-08
84		0.00	0.952	0.000	0.3223	0.0369	0.0000	4.51E-08
85		0.00	0.000	0.226	0.3181	0.0370	0.0000	4.52E-08
86		0.00	0.000	0.085	0.3096	0.0372	0.0000	4.54E-08
87		0.34	0.126	0.157	0.3148	0.0372	0.0000	4.54E-08
88		0.20	0.053	0.128	0.3171	0.0372	0.0000	4.54E-08

89		0.12	0.001	0.156	0.3130	0.0372	0.0000	4.54E-08
90		0.00	0.000	0.064	0.3066	0.0372	0.0000	4.54E-08
91		0.00	0.000	0.084	0.2981	0.0379	0.0000	4.60E-08
92	*	0.28	0.000	0.034	0.3001	0.0385	0.0000	4.66E-08
93	*	0.00	0.000	0.023	0.3021	0.0385	0.0000	4.66E-08
94	*	0.11	0.000	0.000	0.3041	0.0385	0.0000	4.66E-08
95		0.00	0.020	0.140	0.3152	0.0385	0.0000	4.66E-08
96		0.00	0.000	0.158	0.2994	0.0385	0.0000	4.66E-08
97		0.17	0.002	0.173	0.2988	0.0386	0.0000	4.67E-08
98		0.22	0.064	0.124	0.3020	0.0387	0.0000	4.68E-08
99		0.00	0.000	0.058	0.2962	0.0388	0.0000	4.69E-08
100		0.00	0.000	0.047	0.2915	0.0389	0.0000	4.70E-08
101		0.52	0.299	0.079	0.3059	0.0389	0.0000	4.70E-08
102	*	0.00	0.000	0.024	0.3034	0.0392	0.0000	4.73E-08
103	*	0.00	0.000	0.000	0.3034	0.0395	0.0000	4.75E-08
104	*	0.00	0.000	0.000	0.3034	0.0395	0.0000	4.75E-08
105	*	0.03	0.000	0.053	0.3008	0.0395	0.0000	4.75E-08
106		0.17	0.003	0.135	0.3037	0.0395	0.0000	4.75E-08
107		0.06	0.000	0.110	0.2986	0.0394	0.0000	4.75E-08
108		1.16	0.927	0.100	0.3118	0.0394	0.0000	4.75E-08
109		0.00	0.000	0.111	0.3007	0.0394	0.0000	4.75E-08
110		0.22	0.051	0.076	0.3096	0.0394	0.0000	4.75E-08
111		0.00	0.000	0.058	0.3039	0.0394	0.0000	4.75E-08
112		0.07	0.000	0.152	0.2953	0.0394	0.0000	4.74E-08
113		0.00	0.000	0.153	0.2800	0.0394	0.0000	4.74E-08
114		0.00	0.000	0.020	0.2780	0.0394	0.0000	4.74E-08
115		0.00	0.000	0.005	0.2774	0.0393	0.0000	4.74E-08
116		0.00	0.000	0.003	0.2771	0.0393	0.0000	4.74E-08
117		0.00	0.000	0.001	0.2770	0.0393	0.0000	4.74E-08
118	*	0.22	0.000	0.052	0.2790	0.0393	0.0000	4.74E-08
119		0.04	0.000	0.197	0.2787	0.0393	0.0000	4.74E-08
120		0.00	0.000	0.006	0.2781	0.0393	0.0000	4.74E-08

121	1.58	1.371	0.051	0.2935	0.0393	0.0000	4.73E-08
122	0.00	0.000	0.044	0.2895	0.0393	0.0000	4.73E-08
123	0.00	0.000	0.085	0.2810	0.0393	0.0000	4.73E-08
124	0.01	0.000	0.046	0.2774	0.0392	0.0000	4.73E-08
125	0.00	0.000	0.006	0.2771	0.0392	0.0000	4.73E-08
126	0.00	0.000	0.001	0.2770	0.0392	0.0000	4.73E-08
127	0.00	0.000	0.000	0.2770	0.0392	0.0000	4.73E-08
128	0.04	0.000	0.021	0.2785	0.0392	0.0000	4.73E-08
129	0.00	0.000	0.003	0.2782	0.0392	0.0000	4.73E-08
130	0.00	0.000	0.005	0.2776	0.0392	0.0000	4.73E-08
131	0.00	0.000	0.005	0.2772	0.0392	0.0000	4.72E-08
132	0.74	0.534	0.048	0.2934	0.0392	0.0000	4.72E-08
133	0.04	0.000	0.029	0.2943	0.0392	0.0000	4.72E-08
134	0.14	0.000	0.039	0.3040	0.0391	0.0000	4.72E-08
135	0.99	0.761	0.100	0.3169	0.0391	0.0000	4.72E-08
136	0.52	0.278	0.237	0.3177	0.0391	0.0000	4.72E-08
137	0.00	0.000	0.080	0.3097	0.0391	0.0000	4.72E-08
138	0.00	0.000	0.104	0.2993	0.0391	0.0000	4.72E-08
139	0.00	0.000	0.165	0.2828	0.0391	0.0000	4.72E-08
140	0.00	0.000	0.053	0.2775	0.0391	0.0000	4.72E-08
141	0.12	0.000	0.032	0.2865	0.0391	0.0000	4.71E-08
142	0.03	0.000	0.036	0.2858	0.0390	0.0000	4.71E-08
143	0.49	0.299	0.060	0.2987	0.0390	0.0000	4.71E-08
144	0.15	0.005	0.080	0.3056	0.0390	0.0000	4.71E-08
145	0.00	0.000	0.116	0.2939	0.0390	0.0000	4.71E-08
146	0.00	0.000	0.088	0.2851	0.0390	0.0000	4.71E-08
147	0.00	0.000	0.047	0.2803	0.0390	0.0000	4.71E-08
148	0.17	0.012	0.065	0.2899	0.0390	0.0000	4.71E-08
149	0.06	0.000	0.047	0.2915	0.0390	0.0000	4.71E-08
150	0.27	0.097	0.060	0.3028	0.0390	0.0000	4.70E-08
151	0.05	0.000	0.078	0.3003	0.0389	0.0000	4.70E-08
152	0.00	0.000	0.168	0.2835	0.0389	0.0000	4.70E-08

153	0.12	0.000	0.087	0.2865	0.0390	0.0000	4.71E-08
154	0.00	0.000	0.035	0.2830	0.0390	0.0000	4.71E-08
155	0.00	0.000	0.033	0.2797	0.0390	0.0000	4.71E-08
156	0.00	0.000	0.016	0.2781	0.0390	0.0000	4.70E-08
157	0.00	0.000	0.008	0.2773	0.0389	0.0000	4.70E-08
158	0.11	0.000	0.028	0.2859	0.0389	0.0000	4.70E-08
159	0.00	0.000	0.013	0.2846	0.0389	0.0000	4.70E-08
160	0.00	0.000	0.017	0.2829	0.0389	0.0000	4.70E-08
161	0.00	0.000	0.019	0.2810	0.0389	0.0000	4.70E-08
162	0.00	0.000	0.020	0.2791	0.0389	0.0000	4.70E-08
163	0.00	0.000	0.016	0.2775	0.0389	0.0000	4.70E-08
164	0.00	0.000	0.003	0.2771	0.0389	0.0000	4.70E-08
165	0.00	0.000	0.001	0.2770	0.0389	0.0000	4.70E-08
166	0.00	0.000	0.000	0.2770	0.0389	0.0000	4.70E-08
167	0.00	0.000	0.000	0.2770	0.0389	0.0000	4.69E-08
168	0.00	0.000	0.000	0.2770	0.0388	0.0000	4.69E-08
169	0.00	0.000	0.000	0.2770	0.0388	0.0000	4.69E-08
170	0.00	0.000	0.000	0.2770	0.0388	0.0000	4.69E-08
171	0.39	0.210	0.043	0.2909	0.0388	0.0000	4.69E-08
172	0.15	0.010	0.034	0.3017	0.0388	0.0000	4.69E-08
173	0.00	0.000	0.008	0.3009	0.0388	0.0000	4.69E-08
174	0.00	0.000	0.015	0.2994	0.0388	0.0000	4.69E-08
175	0.00	0.000	0.015	0.2979	0.0388	0.0000	4.69E-08
176	0.02	0.000	0.025	0.2974	0.0388	0.0000	4.69E-08
177	0.02	0.000	0.027	0.2969	0.0387	0.0000	4.68E-08
178	0.15	0.000	0.039	0.3077	0.0387	0.0000	4.68E-08
179	0.02	0.000	0.031	0.3069	0.0387	0.0000	4.68E-08
180	0.00	0.000	0.015	0.3055	0.0387	0.0000	4.68E-08
181	0.00	0.000	0.013	0.3043	0.0387	0.0000	4.68E-08
182	0.00	0.000	0.012	0.3031	0.0387	0.0000	4.68E-08
183	0.00	0.000	0.010	0.3021	0.0387	0.0000	4.68E-08
184	0.02	0.000	0.029	0.3014	0.0387	0.0000	4.68E-08

185	0.08	0.000	0.039	0.3055	0.0387	0.0000	4.68E-08
186	0.00	0.000	0.016	0.3038	0.0386	0.0000	4.68E-08
187	0.01	0.000	0.028	0.3024	0.0386	0.0000	4.67E-08
188	0.02	0.000	0.028	0.3012	0.0386	0.0000	4.67E-08
189	0.00	0.000	0.015	0.2996	0.0386	0.0000	4.67E-08
190	0.01	0.000	0.022	0.2985	0.0386	0.0000	4.67E-08
191	0.02	0.000	0.027	0.2973	0.0386	0.0000	4.67E-08
192	0.67	0.497	0.040	0.3109	0.0386	0.0000	4.67E-08
193	0.52	0.236	0.320	0.3075	0.0386	0.0000	4.67E-08
194	0.00	0.000	0.179	0.2897	0.0386	0.0000	4.67E-08
195	0.10	0.000	0.130	0.2869	0.0385	0.0000	4.67E-08
196	0.12	0.000	0.075	0.2911	0.0385	0.0000	4.67E-08
197	0.00	0.000	0.027	0.2884	0.0387	0.0000	4.68E-08
198	0.00	0.000	0.031	0.2853	0.0390	0.0000	4.70E-08
199	0.00	0.000	0.032	0.2821	0.0389	0.0000	4.70E-08
200	0.26	0.103	0.052	0.2929	0.0389	0.0000	4.70E-08
201	0.00	0.000	0.112	0.2817	0.0389	0.0000	4.70E-08
202	0.00	0.000	0.024	0.2793	0.0389	0.0000	4.70E-08
203	0.00	0.000	0.011	0.2781	0.0389	0.0000	4.70E-08
204	0.00	0.000	0.008	0.2773	0.0389	0.0000	4.70E-08
205	0.35	0.167	0.051	0.2902	0.0389	0.0000	4.70E-08
206	0.72	0.555	0.049	0.3015	0.0389	0.0000	4.70E-08
207	0.00	0.000	0.176	0.2838	0.0389	0.0000	4.70E-08
208	0.00	0.000	0.027	0.2812	0.0389	0.0000	4.70E-08
209	0.00	0.000	0.029	0.2783	0.0389	0.0000	4.70E-08
210	0.01	0.000	0.018	0.2772	0.0389	0.0000	4.70E-08
211	0.52	0.321	0.050	0.2923	0.0389	0.0000	4.70E-08
212	0.00	0.000	0.065	0.2858	0.0389	0.0000	4.70E-08
213	0.00	0.000	0.070	0.2788	0.0389	0.0000	4.69E-08
214	0.08	0.000	0.051	0.2815	0.0388	0.0000	4.69E-08
215	0.22	0.063	0.056	0.2913	0.0388	0.0000	4.69E-08
216	0.15	0.000	0.049	0.3008	0.0388	0.0000	4.69E-08

217	0.67	0.496	0.063	0.3123	0.0389	0.0000	4.70E-08
218	0.00	0.000	0.061	0.3062	0.0389	0.0000	4.70E-08
219	0.40	0.165	0.108	0.3191	0.0389	0.0000	4.70E-08
220	0.44	0.234	0.171	0.3228	0.0389	0.0000	4.70E-08
221	0.00	0.000	0.069	0.3163	0.0389	0.0000	4.70E-08
222	0.00	0.000	0.179	0.2984	0.0389	0.0000	4.70E-08
223	0.00	0.000	0.180	0.2804	0.0389	0.0000	4.70E-08
224	0.09	0.000	0.058	0.2835	0.0388	0.0000	4.69E-08
225	0.23	0.068	0.062	0.2940	0.0388	0.0000	4.69E-08
226	0.74	0.396	0.231	0.3048	0.0388	0.0000	4.69E-08
227	0.00	0.000	0.056	0.2992	0.0388	0.0000	4.69E-08
228	0.15	0.001	0.068	0.3073	0.0388	0.0000	4.69E-08
229	1.15	0.801	0.241	0.3180	0.0388	0.0000	4.69E-08
230	0.03	0.000	0.125	0.3083	0.0388	0.0000	4.69E-08
231	0.60	0.286	0.304	0.3094	0.0388	0.0000	4.69E-08
232	0.10	0.000	0.199	0.2998	0.0388	0.0000	4.69E-08
233	0.00	0.000	0.079	0.2918	0.0387	0.0000	4.68E-08
234	0.10	0.000	0.172	0.2844	0.0387	0.0000	4.68E-08
235	0.50	0.194	0.202	0.2952	0.0387	0.0000	4.68E-08
236	0.00	0.000	0.058	0.2893	0.0387	0.0000	4.68E-08
237	0.00	0.000	0.050	0.2843	0.0392	0.0000	4.73E-08
238	0.43	0.163	0.164	0.2945	0.0395	0.0000	4.76E-08
239	0.03	0.000	0.091	0.2880	0.0396	0.0000	4.77E-08
240	0.06	0.000	0.065	0.2874	0.0396	0.0000	4.76E-08
241	0.00	0.000	0.082	0.2796	0.0396	0.0000	4.76E-08
242	0.00	0.000	0.016	0.2781	0.0396	0.0000	4.77E-08
243	0.04	0.000	0.043	0.2780	0.0398	0.0000	4.79E-08
244	0.00	0.000	0.007	0.2773	0.0398	0.0000	4.79E-08
245	0.00	0.000	0.003	0.2771	0.0398	0.0000	4.78E-08
246	0.00	0.000	0.000	0.2770	0.0398	0.0000	4.78E-08
247	0.00	0.000	0.000	0.2770	0.0398	0.0000	4.78E-08
248	0.35	0.159	0.062	0.2898	0.0398	0.0000	4.78E-08

249	0.72	0.546	0.056	0.3011	0.0398	0.0000	4.78E-08
250	0.03	0.000	0.087	0.2953	0.0398	0.0000	4.78E-08
251	0.00	0.000	0.096	0.2857	0.0398	0.0000	4.78E-08
252	0.00	0.000	0.078	0.2779	0.0397	0.0000	4.78E-08
253	0.00	0.000	0.007	0.2772	0.0397	0.0000	4.78E-08
254	0.00	0.000	0.001	0.2770	0.0397	0.0000	4.77E-08
255	0.00	0.000	0.000	0.2770	0.0397	0.0000	4.77E-08
256	0.73	0.499	0.075	0.2922	0.0397	0.0000	4.77E-08
257	0.00	0.000	0.099	0.2823	0.0397	0.0000	4.77E-08
258	0.00	0.000	0.035	0.2789	0.0397	0.0000	4.77E-08
259	0.00	0.000	0.014	0.2774	0.0397	0.0000	4.77E-08
260	0.00	0.000	0.003	0.2771	0.0396	0.0000	4.77E-08
261	0.00	0.000	0.001	0.2770	0.0396	0.0000	4.77E-08
262	0.00	0.000	0.000	0.2770	0.0396	0.0000	4.77E-08
263	0.00	0.000	0.000	0.2770	0.0396	0.0000	4.77E-08
264	0.00	0.000	0.000	0.2770	0.0396	0.0000	4.76E-08
265	0.00	0.000	0.000	0.2770	0.0396	0.0000	4.76E-08
266	0.00	0.000	0.000	0.2770	0.0396	0.0000	4.76E-08
267	0.00	0.000	0.000	0.2770	0.0396	0.0000	4.76E-08
268	0.00	0.000	0.000	0.2770	0.0396	0.0000	4.76E-08
269	0.00	0.000	0.000	0.2770	0.0395	0.0000	4.76E-08
270	0.00	0.000	0.001	0.2770	0.0395	0.0000	4.76E-08
271	0.59	0.383	0.050	0.2927	0.0395	0.0000	4.76E-08
272	0.06	0.000	0.048	0.2936	0.0395	0.0000	4.76E-08
273	0.09	0.000	0.079	0.2942	0.0395	0.0000	4.76E-08
274	1.53	1.322	0.077	0.3072	0.0395	0.0000	4.75E-08
275	0.00	0.000	0.103	0.2969	0.0395	0.0000	4.75E-08
276	0.00	0.000	0.049	0.2920	0.0395	0.0000	4.75E-08
277	0.24	0.075	0.081	0.3005	0.0395	0.0000	4.75E-08
278	0.62	0.366	0.145	0.3110	0.0394	0.0000	4.75E-08
279	0.08	0.000	0.102	0.3089	0.0394	0.0000	4.75E-08
280	0.04	0.000	0.101	0.3031	0.0394	0.0000	4.75E-08

281		0.24	0.058	0.214	0.2998	0.0394	0.0000	4.75E-08
282		0.00	0.000	0.066	0.2933	0.0394	0.0000	4.75E-08
283		0.00	0.000	0.058	0.2874	0.0394	0.0000	4.74E-08
284		0.00	0.000	0.076	0.2798	0.0394	0.0000	4.74E-08
285		0.01	0.000	0.034	0.2775	0.0394	0.0000	4.74E-08
286	*	0.13	0.000	0.062	0.2795	0.0394	0.0000	4.74E-08
287		0.13	0.000	0.076	0.2894	0.0393	0.0000	4.74E-08
288		0.00	0.000	0.067	0.2827	0.0393	0.0000	4.74E-08
289		0.00	0.000	0.042	0.2785	0.0393	0.0000	4.74E-08
290		0.00	0.000	0.011	0.2774	0.0393	0.0000	4.74E-08
291		0.00	0.000	0.002	0.2772	0.0393	0.0000	4.74E-08
292		0.00	0.000	0.001	0.2770	0.0393	0.0000	4.73E-08
293		0.00	0.000	0.000	0.2770	0.0393	0.0000	4.73E-08
294		0.00	0.000	0.000	0.2770	0.0393	0.0000	4.73E-08
295		0.00	0.000	0.000	0.2770	0.0392	0.0000	4.73E-08
296		0.00	0.000	0.000	0.2770	0.0392	0.0000	4.73E-08
297		0.00	0.000	0.000	0.2770	0.0392	0.0000	4.73E-08
298		0.29	0.128	0.041	0.2895	0.0392	0.0000	4.73E-08
299		0.05	0.000	0.035	0.2905	0.0392	0.0000	4.73E-08
300		0.00	0.000	0.018	0.2887	0.0392	0.0000	4.73E-08
301		0.00	0.000	0.014	0.2873	0.0392	0.0000	4.73E-08
302		0.00	0.000	0.017	0.2857	0.0392	0.0000	4.72E-08
303		0.17	0.020	0.042	0.2964	0.0392	0.0000	4.72E-08
304		0.00	0.000	0.010	0.2954	0.0391	0.0000	4.72E-08
305		0.00	0.000	0.013	0.2941	0.0391	0.0000	4.72E-08
306		0.00	0.000	0.012	0.2929	0.0392	0.0000	4.72E-08
307		0.00	0.000	0.011	0.2918	0.0392	0.0000	4.73E-08
308		0.00	0.000	0.011	0.2906	0.0392	0.0000	4.72E-08
309		0.00	0.000	0.011	0.2895	0.0392	0.0000	4.72E-08
310		0.00	0.000	0.011	0.2884	0.0391	0.0000	4.72E-08
311		0.47	0.282	0.044	0.3030	0.0391	0.0000	4.72E-08
312		0.26	0.107	0.063	0.3117	0.0391	0.0000	4.72E-08

313	*	0.42	0.000	0.028	0.3136	0.0391	0.0000	4.72E-08
314		0.00	0.000	0.000	0.3247	0.0391	0.0000	4.72E-08
315	*	0.01	0.000	0.040	0.3266	0.0391	0.0000	4.72E-08
316		0.00	0.029	0.060	0.3394	0.0391	0.0000	4.72E-08
317		0.00	0.000	0.049	0.3345	0.0391	0.0000	4.71E-08
318		0.12	0.003	0.069	0.3393	0.0391	0.0000	4.71E-08
319		0.49	0.304	0.062	0.3516	0.0390	0.0000	4.71E-08
320		0.00	0.000	0.035	0.3481	0.0390	0.0000	4.71E-08
321	*	0.00	0.000	0.022	0.3460	0.0390	0.0000	4.71E-08
322	*	0.00	0.000	0.000	0.3460	0.0390	0.0000	4.71E-08
323		0.00	0.000	0.034	0.3425	0.0390	0.0000	4.71E-08
324		0.00	0.000	0.026	0.3399	0.0390	0.0000	4.71E-08
325	*	0.00	0.000	0.000	0.3399	0.0390	0.0000	4.71E-08
326	*	0.00	0.000	0.000	0.3399	0.0390	0.0000	4.71E-08
327		0.00	0.000	0.045	0.3354	0.0390	0.0000	4.70E-08
328		0.00	0.000	0.079	0.3275	0.0389	0.0000	4.70E-08
329		0.04	0.000	0.133	0.3185	0.0389	0.0000	4.70E-08
330		0.24	0.068	0.077	0.3278	0.0389	0.0000	4.70E-08
331		0.00	0.000	0.043	0.3234	0.0389	0.0000	4.70E-08
332		0.00	0.000	0.089	0.3145	0.0389	0.0000	4.70E-08
333		1.60	1.301	0.149	0.3291	0.0389	0.0000	4.70E-08
334		0.37	0.158	0.104	0.3394	0.0389	0.0000	4.70E-08
335		0.00	0.000	0.106	0.3287	0.0389	0.0000	4.70E-08
336		0.00	0.000	0.092	0.3195	0.0389	0.0000	4.69E-08
337		0.00	0.000	0.146	0.3049	0.0388	0.0000	4.69E-08
338		0.02	0.000	0.062	0.3003	0.0388	0.0000	4.69E-08
339		1.14	0.901	0.082	0.3161	0.0388	0.0000	4.69E-08
340		0.00	0.000	0.064	0.3097	0.0388	0.0000	4.69E-08
341		0.00	0.000	0.078	0.3019	0.0388	0.0000	4.69E-08
342		0.00	0.000	0.126	0.2894	0.0388	0.0000	4.69E-08
343		0.00	0.000	0.051	0.2842	0.0388	0.0000	4.69E-08
344		0.00	0.000	0.042	0.2800	0.0388	0.0000	4.69E-08

345		0.12	0.000	0.056	0.2862	0.0388	0.0000	4.69E-08
346	*	0.00	0.000	0.000	0.2862	0.0390	0.0000	4.71E-08
347	*	0.00	0.000	0.000	0.2862	0.0390	0.0000	4.70E-08
348	*	0.20	0.000	0.051	0.2881	0.0389	0.0000	4.70E-08
349	*	0.02	0.000	0.024	0.2901	0.0389	0.0000	4.70E-08
350	*	0.20	0.000	0.000	0.2921	0.0389	0.0000	4.70E-08
351	*	0.00	0.000	0.021	0.2940	0.0389	0.0000	4.70E-08
352	*	0.00	0.000	0.011	0.2960	0.0389	0.0000	4.70E-08
353		0.00	0.048	0.036	0.3088	0.0389	0.0000	4.70E-08
354	*	0.00	0.000	0.021	0.3067	0.0390	0.0000	4.71E-08
355		0.00	0.000	0.024	0.3043	0.0391	0.0000	4.71E-08
356		0.00	0.000	0.028	0.3015	0.0390	0.0000	4.71E-08
357		0.39	0.190	0.060	0.3155	0.0390	0.0000	4.71E-08
358		0.30	0.140	0.051	0.3261	0.0390	0.0000	4.71E-08
359		0.04	0.000	0.044	0.3256	0.0390	0.0000	4.71E-08
360		0.44	0.238	0.076	0.3381	0.0390	0.0000	4.71E-08
361		1.11	0.898	0.134	0.3464	0.0390	0.0000	4.71E-08
362		0.00	0.000	0.075	0.3389	0.0390	0.0000	4.71E-08
363		0.02	0.000	0.060	0.3351	0.0390	0.0000	4.70E-08
364		0.00	0.000	0.056	0.3295	0.0389	0.0000	4.70E-08
365		0.00	0.000	0.070	0.3225	0.0389	0.0000	4.70E-08

* = Frozen (air or soil)

Annual Totals for Year 9			
	inches	cubic feet	percent
Precipitation	38.65	140,315.5	100.00
Runoff	20.354	73,886.4	52.66
Evapotranspiration	18.033	65,460.1	46.65
Recirculation into Layer 1	0.0016	5.8039	0.00
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0016	5.8039	0.00
Percolation/Leakage through Layer 5	0.000017	0.0619	0.00
Average Head on Top of Layer 4	0.0386	---	---
Change in Water Storage	0.2669	968.9	0.69
Soil Water at Start of Year	1,406.6645	5,106,192.1	3639.08
Soil Water at End of Year	1,406.9314	5,107,161.1	3639.77
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0016	-5.8033	0.00

Daily Output for Year 10

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.038	0.3186	0.0389	0.0000	4.70E-08
2			0.00	0.000	0.027	0.3159	0.0389	0.0000	4.70E-08
3			0.00	0.000	0.036	0.3123	0.0389	0.0000	4.70E-08
4	*		0.00	0.000	0.020	0.3103	0.0389	0.0000	4.70E-08
5			0.00	0.000	0.042	0.3061	0.0389	0.0000	4.70E-08
6			0.00	0.000	0.030	0.3032	0.0389	0.0000	4.70E-08
7	*		0.00	0.000	0.000	0.3032	0.0389	0.0000	4.70E-08
8			0.00	0.000	0.026	0.3005	0.0388	0.0000	4.69E-08
9			0.00	0.000	0.043	0.2962	0.0388	0.0000	4.69E-08
10			0.00	0.000	0.037	0.2925	0.0388	0.0000	4.69E-08
11			0.00	0.000	0.050	0.2875	0.0388	0.0000	4.69E-08
12			0.00	0.000	0.040	0.2835	0.0388	0.0000	4.69E-08
13			0.00	0.000	0.025	0.2810	0.0388	0.0000	4.69E-08
14			0.00	0.000	0.025	0.2785	0.0388	0.0000	4.69E-08
15			0.00	0.000	0.015	0.2770	0.0388	0.0000	4.69E-08
16			0.00	0.000	0.000	0.2770	0.0388	0.0000	4.69E-08
17			0.00	0.000	0.001	0.2770	0.0387	0.0000	4.68E-08
18			0.00	0.000	0.001	0.2770	0.0387	0.0000	4.68E-08
19			0.25	0.089	0.034	0.2897	0.0387	0.0000	4.68E-08
20			0.02	0.000	0.022	0.2895	0.0387	0.0000	4.68E-08
21			0.03	0.000	0.030	0.2892	0.0387	0.0000	4.68E-08
22			0.00	0.000	0.012	0.2880	0.0387	0.0000	4.68E-08
23			0.21	0.046	0.036	0.3009	0.0387	0.0000	4.68E-08
24	*		0.00	0.000	0.000	0.3009	0.0387	0.0000	4.68E-08

25	*	0.01	0.000	0.011	0.3009	0.0387	0.0000	4.68E-08
26	*	0.00	0.000	0.001	0.3009	0.0386	0.0000	4.68E-08
27	*	0.00	0.000	0.000	0.3009	0.0386	0.0000	4.67E-08
28	*	0.00	0.000	0.000	0.3009	0.0386	0.0000	4.67E-08
29	*	0.34	0.000	0.041	0.3029	0.0386	0.0000	4.67E-08
30	*	0.11	0.000	0.021	0.3048	0.0386	0.0000	4.67E-08
31	*	0.14	0.000	0.026	0.3068	0.0386	0.0000	4.67E-08
32	*	0.10	0.000	0.000	0.3088	0.0386	0.0000	4.67E-08
33		0.00	0.336	0.060	0.3215	0.0386	0.0000	4.67E-08
34		0.00	0.000	0.023	0.3192	0.0386	0.0000	4.67E-08
35		0.00	0.000	0.039	0.3153	0.0385	0.0000	4.67E-08
36		0.00	0.000	0.053	0.3100	0.0385	0.0000	4.66E-08
37		0.04	0.000	0.065	0.3079	0.0385	0.0000	4.66E-08
38		0.01	0.000	0.073	0.3012	0.0385	0.0000	4.66E-08
39		0.00	0.000	0.033	0.2979	0.0385	0.0000	4.66E-08
40		0.00	0.000	0.078	0.2902	0.0385	0.0000	4.66E-08
41		0.04	0.000	0.077	0.2863	0.0385	0.0000	4.66E-08
42		0.42	0.200	0.079	0.3008	0.0385	0.0000	4.66E-08
43		0.00	0.000	0.090	0.2919	0.0385	0.0000	4.66E-08
44		0.00	0.000	0.076	0.2843	0.0384	0.0000	4.66E-08
45		0.00	0.000	0.057	0.2786	0.0384	0.0000	4.66E-08
46		0.00	0.000	0.008	0.2778	0.0384	0.0000	4.65E-08
47		0.00	0.000	0.004	0.2774	0.0384	0.0000	4.65E-08
48		0.00	0.000	0.003	0.2771	0.0384	0.0000	4.65E-08
49		0.11	0.000	0.029	0.2850	0.0384	0.0000	4.65E-08
50		0.00	0.000	0.012	0.2839	0.0384	0.0000	4.65E-08
51		0.00	0.000	0.013	0.2825	0.0384	0.0000	4.65E-08
52		0.00	0.000	0.015	0.2810	0.0384	0.0000	4.65E-08
53		0.00	0.000	0.015	0.2795	0.0383	0.0000	4.65E-08
54		0.00	0.000	0.014	0.2781	0.0383	0.0000	4.65E-08
55		0.00	0.000	0.005	0.2776	0.0383	0.0000	4.65E-08
56		0.67	0.465	0.045	0.2935	0.0383	0.0000	4.64E-08

57		0.00	0.000	0.058	0.2878	0.0383	0.0000	4.64E-08
58		0.00	0.000	0.012	0.2865	0.0383	0.0000	4.64E-08
59		0.00	0.000	0.012	0.2853	0.0383	0.0000	4.64E-08
60		0.00	0.000	0.012	0.2841	0.0383	0.0000	4.64E-08
61	*	0.00	0.000	0.000	0.2841	0.0383	0.0000	4.64E-08
62	*	0.03	0.000	0.030	0.2841	0.0382	0.0000	4.64E-08
63		0.00	0.000	0.011	0.2830	0.0382	0.0000	4.64E-08
64	*	0.00	0.000	0.011	0.2820	0.0382	0.0000	4.64E-08
65		0.00	0.000	0.010	0.2809	0.0382	0.0000	4.63E-08
66	*	0.00	0.000	0.010	0.2799	0.0382	0.0000	4.63E-08
67		0.00	0.000	0.012	0.2787	0.0382	0.0000	4.63E-08
68		0.42	0.238	0.040	0.2934	0.0382	0.0000	4.63E-08
69		0.00	0.000	0.032	0.2904	0.0382	0.0000	4.63E-08
70	*	0.36	0.000	0.035	0.2923	0.0382	0.0000	4.63E-08
71	*	0.01	0.000	0.020	0.2943	0.0381	0.0000	4.63E-08
72	*	0.00	0.000	0.015	0.2963	0.0381	0.0000	4.63E-08
73	*	0.00	0.000	0.032	0.2982	0.0381	0.0000	4.63E-08
74	*	0.07	0.000	0.000	0.3002	0.0381	0.0000	4.63E-08
75	*	0.11	0.000	0.019	0.3022	0.0381	0.0000	4.62E-08
76	*	0.00	0.000	0.011	0.3041	0.0381	0.0000	4.62E-08
77	*	0.00	0.000	0.030	0.3061	0.0381	0.0000	4.62E-08
78	*	0.00	0.000	0.021	0.3081	0.0381	0.0000	4.62E-08
79	*	0.00	0.000	0.074	0.3101	0.0381	0.0000	4.62E-08
80		0.03	0.000	0.093	0.3136	0.0380	0.0000	4.62E-08
81	*	0.43	0.000	0.035	0.3156	0.0380	0.0000	4.62E-08
82		0.69	0.937	0.000	0.3283	0.0380	0.0000	4.62E-08
83	*	0.00	0.000	0.000	0.3283	0.0380	0.0000	4.62E-08
84	*	0.00	0.000	0.057	0.3226	0.0380	0.0000	4.62E-08
85		0.00	0.000	0.076	0.3149	0.0380	0.0000	4.61E-08
86		0.00	0.000	0.039	0.3111	0.0380	0.0000	4.61E-08
87		0.00	0.000	0.077	0.3034	0.0380	0.0000	4.61E-08
88		0.02	0.000	0.050	0.3000	0.0380	0.0000	4.61E-08

89		0.00	0.000	0.050	0.2955	0.0379	0.0000	4.61E-08
90		0.00	0.000	0.043	0.2912	0.0380	0.0000	4.61E-08
91		0.00	0.000	0.077	0.2835	0.0381	0.0000	4.62E-08
92		0.00	0.000	0.056	0.2780	0.0381	0.0000	4.62E-08
93		0.00	0.000	0.007	0.2772	0.0381	0.0000	4.62E-08
94		0.00	0.000	0.002	0.2770	0.0381	0.0000	4.62E-08
95		0.00	0.000	0.000	0.2770	0.0381	0.0000	4.62E-08
96		0.11	0.000	0.028	0.2853	0.0380	0.0000	4.62E-08
97		0.08	0.000	0.037	0.2896	0.0380	0.0000	4.62E-08
98		0.13	0.000	0.039	0.2983	0.0380	0.0000	4.62E-08
99		0.00	0.000	0.011	0.2972	0.0380	0.0000	4.62E-08
100	*	0.00	0.000	0.016	0.2956	0.0380	0.0000	4.62E-08
101	*	0.00	0.000	0.000	0.2956	0.0380	0.0000	4.61E-08
102		0.00	0.000	0.015	0.2941	0.0380	0.0000	4.61E-08
103		0.00	0.000	0.014	0.2926	0.0380	0.0000	4.61E-08
104		0.05	0.000	0.035	0.2939	0.0380	0.0000	4.61E-08
105		0.00	0.000	0.016	0.2923	0.0380	0.0000	4.61E-08
106		0.00	0.000	0.015	0.2908	0.0379	0.0000	4.61E-08
107		0.01	0.000	0.019	0.2896	0.0379	0.0000	4.61E-08
108		0.00	0.000	0.015	0.2884	0.0379	0.0000	4.61E-08
109		0.00	0.000	0.011	0.2873	0.0379	0.0000	4.61E-08
110		0.00	0.000	0.011	0.2862	0.0379	0.0000	4.61E-08
111	*	0.62	0.000	0.044	0.2881	0.0379	0.0000	4.60E-08
112	*	0.18	0.000	0.028	0.2901	0.0379	0.0000	4.60E-08
113		0.50	1.058	0.000	0.3028	0.0379	0.0000	4.60E-08
114	*	0.94	0.000	0.043	0.3048	0.0379	0.0000	4.60E-08
115		0.00	0.710	0.038	0.3175	0.0378	0.0000	4.60E-08
116		0.00	0.000	0.133	0.3042	0.0378	0.0000	4.60E-08
117		0.00	0.000	0.186	0.2856	0.0378	0.0000	4.60E-08
118		0.10	0.000	0.082	0.2875	0.0378	0.0000	4.60E-08
119		0.00	0.000	0.074	0.2801	0.0378	0.0000	4.60E-08
120		0.00	0.000	0.021	0.2780	0.0378	0.0000	4.60E-08

121	0.00	0.000	0.008	0.2772	0.0378	0.0000	4.59E-08
122	0.06	0.000	0.029	0.2808	0.0378	0.0000	4.59E-08
123	0.13	0.000	0.041	0.2899	0.0378	0.0000	4.59E-08
124	0.03	0.000	0.032	0.2901	0.0377	0.0000	4.59E-08
125	0.06	0.000	0.038	0.2925	0.0377	0.0000	4.59E-08
126	0.43	0.238	0.052	0.3063	0.0377	0.0000	4.59E-08
127	0.00	0.000	0.060	0.3003	0.0377	0.0000	4.59E-08
128	2.14	1.898	0.087	0.3154	0.0377	0.0000	4.59E-08
129	1.00	0.675	0.256	0.3227	0.0377	0.0000	4.59E-08
130	0.57	0.355	0.104	0.3338	0.0377	0.0000	4.59E-08
131	0.00	0.000	0.220	0.3118	0.0377	0.0000	4.58E-08
132	0.00	0.000	0.079	0.3039	0.0377	0.0000	4.58E-08
133	0.00	0.000	0.233	0.2806	0.0376	0.0000	4.58E-08
134	0.02	0.000	0.050	0.2779	0.0376	0.0000	4.58E-08
135	0.01	0.000	0.013	0.2774	0.0376	0.0000	4.58E-08
136	1.09	0.863	0.068	0.2936	0.0376	0.0000	4.58E-08
137	0.01	0.000	0.067	0.2877	0.0376	0.0000	4.58E-08
138	1.06	0.825	0.081	0.3032	0.0376	0.0000	4.58E-08
139	0.00	0.000	0.102	0.2930	0.0376	0.0000	4.58E-08
140	0.00	0.000	0.071	0.2859	0.0376	0.0000	4.58E-08
141	0.00	0.000	0.067	0.2792	0.0376	0.0000	4.57E-08
142	0.42	0.156	0.239	0.2822	0.0376	0.0000	4.57E-08
143	0.05	0.000	0.044	0.2824	0.0375	0.0000	4.57E-08
144	0.00	0.000	0.039	0.2785	0.0375	0.0000	4.57E-08
145	0.00	0.000	0.011	0.2774	0.0375	0.0000	4.57E-08
146	0.00	0.000	0.003	0.2771	0.0375	0.0000	4.57E-08
147	0.00	0.000	0.001	0.2770	0.0375	0.0000	4.57E-08
148	0.02	0.000	0.019	0.2776	0.0375	0.0000	4.57E-08
149	0.00	0.000	0.003	0.2773	0.0375	0.0000	4.57E-08
150	0.02	0.000	0.018	0.2775	0.0375	0.0000	4.57E-08
151	0.31	0.130	0.051	0.2900	0.0375	0.0000	4.57E-08
152	0.00	0.000	0.011	0.2889	0.0375	0.0000	4.57E-08

153	0.00	0.000	0.016	0.2873	0.0375	0.0000	4.57E-08
154	0.00	0.000	0.015	0.2859	0.0375	0.0000	4.57E-08
155	0.00	0.000	0.014	0.2845	0.0375	0.0000	4.56E-08
156	0.22	0.067	0.040	0.2960	0.0374	0.0000	4.56E-08
157	0.00	0.000	0.014	0.2946	0.0374	0.0000	4.56E-08
158	0.00	0.000	0.015	0.2931	0.0374	0.0000	4.56E-08
159	0.00	0.000	0.013	0.2918	0.0374	0.0000	4.56E-08
160	0.00	0.000	0.013	0.2904	0.0374	0.0000	4.56E-08
161	0.00	0.000	0.013	0.2892	0.0374	0.0000	4.56E-08
162	0.00	0.000	0.013	0.2878	0.0374	0.0000	4.56E-08
163	0.00	0.000	0.013	0.2866	0.0374	0.0000	4.56E-08
164	0.00	0.000	0.013	0.2853	0.0374	0.0000	4.56E-08
165	0.00	0.000	0.012	0.2840	0.0374	0.0000	4.56E-08
166	0.67	0.473	0.042	0.2993	0.0374	0.0000	4.56E-08
167	0.00	0.000	0.062	0.2931	0.0374	0.0000	4.56E-08
168	0.05	0.000	0.103	0.2880	0.0374	0.0000	4.56E-08
169	0.03	0.000	0.097	0.2818	0.0374	0.0000	4.56E-08
170	0.54	0.326	0.085	0.2946	0.0373	0.0000	4.55E-08
171	0.37	0.124	0.233	0.2964	0.0373	0.0000	4.55E-08
172	0.29	0.096	0.162	0.2995	0.0373	0.0000	4.55E-08
173	0.17	0.006	0.130	0.3025	0.0373	0.0000	4.55E-08
174	0.00	0.000	0.125	0.2900	0.0373	0.0000	4.55E-08
175	0.23	0.065	0.117	0.2951	0.0373	0.0000	4.55E-08
176	2.64	2.440	0.083	0.3064	0.0373	0.0000	4.55E-08
177	0.01	0.000	0.078	0.3001	0.0373	0.0000	4.55E-08
178	0.00	0.000	0.168	0.2834	0.0373	0.0000	4.55E-08
179	0.11	0.000	0.106	0.2835	0.0373	0.0000	4.55E-08
180	0.13	0.000	0.071	0.2895	0.0376	0.0000	4.58E-08
181	0.00	0.000	0.026	0.2869	0.0379	0.0000	4.60E-08
182	0.00	0.000	0.034	0.2835	0.0378	0.0000	4.60E-08
183	0.00	0.000	0.026	0.2809	0.0378	0.0000	4.60E-08
184	0.00	0.000	0.026	0.2783	0.0378	0.0000	4.60E-08

185	0.00	0.000	0.010	0.2773	0.0378	0.0000	4.60E-08
186	0.00	0.000	0.002	0.2770	0.0378	0.0000	4.60E-08
187	0.00	0.000	0.000	0.2770	0.0378	0.0000	4.60E-08
188	0.00	0.000	0.000	0.2770	0.0378	0.0000	4.59E-08
189	0.45	0.251	0.051	0.2915	0.0378	0.0000	4.59E-08
190	0.15	0.008	0.037	0.3023	0.0378	0.0000	4.59E-08
191	0.00	0.000	0.096	0.2926	0.0377	0.0000	4.59E-08
192	0.82	0.626	0.049	0.3069	0.0377	0.0000	4.59E-08
193	0.11	0.000	0.212	0.2970	0.0377	0.0000	4.59E-08
194	0.00	0.000	0.128	0.2842	0.0377	0.0000	4.59E-08
195	0.22	0.053	0.114	0.2895	0.0377	0.0000	4.59E-08
196	0.00	0.000	0.049	0.2846	0.0377	0.0000	4.59E-08
197	0.00	0.000	0.039	0.2807	0.0379	0.0000	4.61E-08
198	0.23	0.073	0.059	0.2908	0.0381	0.0000	4.63E-08
199	0.41	0.135	0.234	0.2944	0.0381	0.0000	4.62E-08
200	0.00	0.000	0.066	0.2878	0.0381	0.0000	4.62E-08
201	0.00	0.000	0.050	0.2828	0.0381	0.0000	4.62E-08
202	0.39	0.175	0.088	0.2959	0.0381	0.0000	4.62E-08
203	0.03	0.000	0.084	0.2904	0.0381	0.0000	4.62E-08
204	0.00	0.000	0.063	0.2841	0.0380	0.0000	4.62E-08
205	0.35	0.134	0.116	0.2943	0.0380	0.0000	4.62E-08
206	0.16	0.009	0.092	0.3002	0.0380	0.0000	4.62E-08
207	0.35	0.125	0.224	0.3003	0.0380	0.0000	4.62E-08
208	0.01	0.000	0.062	0.2949	0.0380	0.0000	4.62E-08
209	0.00	0.000	0.064	0.2886	0.0380	0.0000	4.61E-08
210	0.00	0.000	0.073	0.2813	0.0380	0.0000	4.61E-08
211	0.00	0.000	0.038	0.2775	0.0380	0.0000	4.61E-08
212	0.00	0.000	0.003	0.2772	0.0380	0.0000	4.61E-08
213	0.00	0.000	0.002	0.2771	0.0380	0.0000	4.62E-08
214	0.05	0.000	0.026	0.2790	0.0380	0.0000	4.61E-08
215	0.32	0.126	0.061	0.2929	0.0380	0.0000	4.61E-08
216	0.07	0.000	0.039	0.2962	0.0380	0.0000	4.61E-08

217	0.73	0.550	0.056	0.3085	0.0380	0.0000	4.61E-08
218	0.08	0.000	0.088	0.3080	0.0379	0.0000	4.61E-08
219	0.00	0.000	0.155	0.2925	0.0379	0.0000	4.61E-08
220	1.04	0.703	0.200	0.3066	0.0379	0.0000	4.61E-08
221	0.04	0.000	0.191	0.2919	0.0379	0.0000	4.61E-08
222	0.01	0.000	0.107	0.2822	0.0379	0.0000	4.61E-08
223	0.78	0.504	0.118	0.2977	0.0379	0.0000	4.61E-08
224	0.00	0.000	0.090	0.2892	0.0379	0.0000	4.60E-08
225	0.00	0.000	0.099	0.2793	0.0379	0.0000	4.60E-08
226	0.00	0.000	0.018	0.2775	0.0379	0.0000	4.60E-08
227	0.00	0.000	0.003	0.2772	0.0378	0.0000	4.60E-08
228	0.00	0.000	0.001	0.2770	0.0378	0.0000	4.60E-08
229	0.26	0.093	0.057	0.2881	0.0378	0.0000	4.60E-08
230	0.32	0.143	0.066	0.2994	0.0378	0.0000	4.60E-08
231	0.00	0.000	0.043	0.2951	0.0378	0.0000	4.60E-08
232	0.05	0.000	0.052	0.2954	0.0378	0.0000	4.60E-08
233	0.69	0.509	0.063	0.3074	0.0378	0.0000	4.60E-08
234	0.20	0.052	0.094	0.3133	0.0378	0.0000	4.59E-08
235	0.00	0.000	0.192	0.2941	0.0378	0.0000	4.59E-08
236	0.00	0.000	0.114	0.2827	0.0378	0.0000	4.59E-08
237	0.00	0.000	0.054	0.2773	0.0378	0.0000	4.59E-08
238	0.00	0.000	0.002	0.2771	0.0378	0.0000	4.59E-08
239	0.00	0.000	0.001	0.2770	0.0378	0.0000	4.59E-08
240	0.00	0.000	0.000	0.2770	0.0378	0.0000	4.59E-08
241	0.82	0.597	0.073	0.2924	0.0377	0.0000	4.59E-08
242	0.39	0.128	0.235	0.2951	0.0377	0.0000	4.59E-08
243	0.00	0.000	0.108	0.2846	0.0377	0.0000	4.59E-08
244	0.00	0.000	0.065	0.2781	0.0377	0.0000	4.59E-08
245	0.05	0.000	0.038	0.2796	0.0377	0.0000	4.59E-08
246	0.18	0.020	0.054	0.2903	0.0377	0.0000	4.59E-08
247	0.00	0.000	0.025	0.2882	0.0377	0.0000	4.59E-08
248	0.40	0.191	0.064	0.3026	0.0377	0.0000	4.58E-08

249	0.00	0.000	0.072	0.2954	0.0377	0.0000	4.58E-08
250	0.00	0.000	0.128	0.2827	0.0376	0.0000	4.58E-08
251	0.00	0.000	0.046	0.2781	0.0376	0.0000	4.58E-08
252	0.03	0.000	0.035	0.2779	0.0376	0.0000	4.58E-08
253	0.22	0.063	0.050	0.2888	0.0376	0.0000	4.58E-08
254	0.00	0.000	0.022	0.2866	0.0376	0.0000	4.58E-08
255	0.05	0.000	0.050	0.2867	0.0376	0.0000	4.58E-08
256	0.00	0.000	0.032	0.2835	0.0376	0.0000	4.58E-08
257	0.00	0.000	0.025	0.2809	0.0376	0.0000	4.58E-08
258	0.00	0.000	0.027	0.2782	0.0376	0.0000	4.58E-08
259	0.00	0.000	0.008	0.2774	0.0376	0.0000	4.58E-08
260	0.04	0.000	0.028	0.2791	0.0377	0.0000	4.58E-08
261	0.23	0.063	0.043	0.2916	0.0376	0.0000	4.58E-08
262	0.01	0.000	0.024	0.2905	0.0376	0.0000	4.58E-08
263	0.00	0.000	0.020	0.2884	0.0376	0.0000	4.58E-08
264	0.00	0.000	0.018	0.2866	0.0376	0.0000	4.58E-08
265	0.00	0.000	0.016	0.2850	0.0376	0.0000	4.58E-08
266	0.00	0.000	0.014	0.2836	0.0376	0.0000	4.58E-08
267	0.00	0.000	0.018	0.2818	0.0376	0.0000	4.58E-08
268	0.07	0.000	0.041	0.2846	0.0376	0.0000	4.58E-08
269	0.02	0.000	0.029	0.2833	0.0376	0.0000	4.57E-08
270	1.00	0.818	0.054	0.2958	0.0376	0.0000	4.57E-08
271	0.09	0.000	0.142	0.2906	0.0375	0.0000	4.57E-08
272	0.43	0.149	0.174	0.3014	0.0376	0.0000	4.58E-08
273	0.05	0.000	0.111	0.2953	0.0376	0.0000	4.58E-08
274	0.00	0.000	0.099	0.2855	0.0376	0.0000	4.58E-08
275	0.00	0.000	0.059	0.2796	0.0376	0.0000	4.58E-08
276	0.00	0.000	0.017	0.2778	0.0376	0.0000	4.58E-08
277	0.00	0.000	0.006	0.2772	0.0376	0.0000	4.58E-08
278	0.00	0.000	0.002	0.2770	0.0376	0.0000	4.58E-08
279	0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08
280	0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08

281		0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08
282		0.00	0.000	0.000	0.2770	0.0376	0.0000	4.58E-08
283		0.01	0.000	0.008	0.2770	0.0376	0.0000	4.57E-08
284		0.00	0.000	0.000	0.2770	0.0375	0.0000	4.57E-08
285		0.00	0.000	0.000	0.2770	0.0375	0.0000	4.57E-08
286		0.17	0.006	0.039	0.2896	0.0375	0.0000	4.57E-08
287		0.00	0.000	0.009	0.2886	0.0375	0.0000	4.57E-08
288		0.00	0.000	0.014	0.2872	0.0375	0.0000	4.57E-08
289		0.00	0.000	0.013	0.2859	0.0375	0.0000	4.57E-08
290		0.00	0.000	0.013	0.2847	0.0375	0.0000	4.57E-08
291		0.00	0.000	0.013	0.2834	0.0375	0.0000	4.57E-08
292		0.00	0.000	0.013	0.2821	0.0375	0.0000	4.57E-08
293		0.00	0.000	0.012	0.2809	0.0375	0.0000	4.56E-08
294		0.00	0.000	0.011	0.2798	0.0374	0.0000	4.56E-08
295		0.00	0.000	0.010	0.2788	0.0374	0.0000	4.56E-08
296		0.54	0.339	0.044	0.2948	0.0374	0.0000	4.56E-08
297	*	1.40	0.000	0.032	0.2968	0.0374	0.0000	4.56E-08
298		0.00	0.187	0.009	0.3095	0.0374	0.0000	4.56E-08
299	*	0.00	0.000	0.034	0.3115	0.0374	0.0000	4.56E-08
300		0.00	0.312	0.000	0.3241	0.0374	0.0000	4.56E-08
301		0.00	0.364	0.051	0.3358	0.0374	0.0000	4.56E-08
302		0.00	0.000	0.047	0.3310	0.0374	0.0000	4.56E-08
303	*	0.72	0.000	0.029	0.3330	0.0374	0.0000	4.56E-08
304	*	0.00	0.000	0.035	0.3350	0.0373	0.0000	4.55E-08
305	*	0.00	0.000	0.037	0.3369	0.0373	0.0000	4.55E-08
306		0.00	0.367	0.066	0.3497	0.0373	0.0000	4.55E-08
307		0.00	0.000	0.066	0.3431	0.0373	0.0000	4.55E-08
308		0.00	0.000	0.079	0.3352	0.0373	0.0000	4.55E-08
309		0.00	0.000	0.081	0.3271	0.0373	0.0000	4.55E-08
310		0.00	0.000	0.058	0.3213	0.0373	0.0000	4.55E-08
311		0.00	0.000	0.071	0.3142	0.0373	0.0000	4.55E-08
312		0.00	0.000	0.055	0.3087	0.0373	0.0000	4.55E-08

313		0.00	0.000	0.062	0.3025	0.0372	0.0000	4.54E-08
314		0.00	0.000	0.073	0.2952	0.0372	0.0000	4.54E-08
315		0.71	0.445	0.103	0.3113	0.0372	0.0000	4.54E-08
316		0.00	0.000	0.065	0.3047	0.0372	0.0000	4.54E-08
317		0.00	0.000	0.059	0.2988	0.0372	0.0000	4.54E-08
318		0.00	0.000	0.084	0.2904	0.0372	0.0000	4.54E-08
319		0.00	0.000	0.042	0.2862	0.0372	0.0000	4.54E-08
320		0.00	0.000	0.038	0.2824	0.0372	0.0000	4.54E-08
321	*	0.76	0.000	0.027	0.2844	0.0372	0.0000	4.54E-08
322		0.00	0.000	0.034	0.2957	0.0371	0.0000	4.54E-08
323	*	0.00	0.000	0.028	0.2977	0.0371	0.0000	4.53E-08
324		0.00	0.000	0.032	0.3095	0.0371	0.0000	4.53E-08
325		0.12	0.234	0.000	0.3220	0.0371	0.0000	4.53E-08
326	*	0.00	0.000	0.045	0.3239	0.0371	0.0000	4.53E-08
327	*	0.00	0.000	0.022	0.3259	0.0371	0.0000	4.53E-08
328	*	0.45	0.000	0.000	0.3279	0.0371	0.0000	4.53E-08
329		0.00	0.068	0.023	0.3406	0.0371	0.0000	4.53E-08
330		0.00	0.071	0.048	0.3523	0.0371	0.0000	4.53E-08
331		0.00	0.000	0.025	0.3497	0.0370	0.0000	4.53E-08
332	*	0.00	0.000	0.000	0.3497	0.0370	0.0000	4.53E-08
333	*	0.75	0.000	0.022	0.3517	0.0370	0.0000	4.52E-08
334	*	0.00	0.000	0.011	0.3536	0.0370	0.0000	4.52E-08
335	*	0.74	0.000	0.000	0.3556	0.0370	0.0000	4.52E-08
336	*	0.11	0.000	0.015	0.3576	0.0370	0.0000	4.52E-08
337		0.03	0.031	0.000	0.3703	0.0370	0.0000	4.52E-08
338	*	0.00	0.000	0.029	0.3723	0.0370	0.0000	4.52E-08
339	*	0.00	0.000	0.031	0.3743	0.0370	0.0000	4.52E-08
340	*	0.00	0.000	0.013	0.3763	0.0370	0.0000	4.52E-08
341	*	0.00	0.000	0.028	0.3783	0.0369	0.0000	4.52E-08
342		0.00	0.005	0.041	0.3849	0.0369	0.0000	4.52E-08
343	*	0.02	0.000	0.025	0.3869	0.0369	0.0000	4.51E-08
344		0.24	0.056	0.000	0.3996	0.0369	0.0000	4.51E-08

345			0.05	0.567	0.000	0.4112	0.0369	0.0000	4.51E-08
346			0.00	0.326	0.011	0.4178	0.0369	0.0000	4.51E-08
347			0.00	0.000	0.051	0.4172	0.0369	0.0000	4.51E-08
348	*		0.00	0.000	0.020	0.4152	0.0369	0.0000	4.51E-08
349	*	*	0.00	0.000	0.000	0.4152	0.0369	0.0000	4.51E-08
350		*	0.07	0.006	0.025	0.4187	0.0368	0.0000	4.51E-08
351		*	0.35	0.237	0.027	0.4273	0.0368	0.0000	4.51E-08
352			0.00	0.000	0.061	0.4213	0.0368	0.0000	4.51E-08
353			0.00	0.000	0.074	0.4135	0.0368	0.0000	4.50E-08
354			0.00	0.000	0.045	0.4038	0.0368	0.0000	4.50E-08
355			0.00	0.000	0.077	0.3913	0.0472	0.0000	5.48E-08
356	*		0.05	0.000	0.049	0.3881	0.1491	0.0000	1.51E-07
357	*		0.00	0.000	0.000	0.3858	0.2650	0.0000	2.56E-07
358	*		0.00	0.000	0.028	0.3810	0.3534	0.0000	3.33E-07
359	*	*	0.00	0.000	0.000	0.3810	0.4371	0.0000	4.05E-07
360	*	*	0.06	0.000	0.010	0.3810	0.5014	0.0001	4.59E-07
361	*	*	0.01	0.000	0.017	0.3810	0.5398	0.0001	4.91E-07
362		*	0.61	0.613	0.000	0.3847	0.5673	0.0001	5.14E-07
363		*	0.00	0.000	0.002	0.3847	0.5830	0.0001	5.27E-07
364			0.03	0.000	0.057	0.3800	0.5834	0.0001	5.27E-07
365			0.53	0.347	0.050	0.3924	0.5843	0.0001	5.28E-07

* = Frozen (air or soil)

Annual Totals for Year 10			
	inches	cubic feet	percent
Precipitation	41.28	149,854.0	100.00
Runoff	23.693	86,004.3	57.39
Evapotranspiration	16.683	60,558.3	40.41
Recirculation into Layer 1	0.0020	7.4037	0.00
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0020	7.4037	0.00
Percolation/Leakage through Layer 5	0.000021	0.0745	0.00
Average Head on Top of Layer 4	0.0493	---	---
Change in Water Storage	0.9066	3,291.1	2.20
Soil Water at Start of Year	1,406.9314	5,107,161.1	3408.09
Soil Water at End of Year	1,407.8381	5,110,452.2	3410.29
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0020	-7.1792	0.00

Daily Output for Year 11

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.053	0.3862	0.5975	0.0001	5.39E-07
2	*		0.00	0.000	0.034	0.3828	0.6311	0.0001	5.66E-07
3			0.00	0.000	0.056	0.3773	0.6654	0.0001	5.94E-07
4			0.00	0.000	0.046	0.3726	0.6907	0.0001	6.15E-07
5			0.00	0.000	0.067	0.3659	0.7000	0.0001	6.23E-07
6			0.00	0.000	0.066	0.3593	0.6998	0.0001	6.22E-07
7			0.00	0.000	0.070	0.3523	0.6996	0.0001	6.22E-07
8			0.00	0.000	0.073	0.3450	0.6994	0.0001	6.22E-07
9			0.00	0.000	0.088	0.3362	0.6992	0.0001	6.22E-07
10			0.00	0.000	0.088	0.3274	0.6990	0.0001	6.22E-07
11	*		0.00	0.000	0.032	0.3241	0.6988	0.0001	6.22E-07
12	*		0.00	0.000	0.000	0.3242	0.6986	0.0001	6.21E-07
13			0.00	0.000	0.041	0.3200	0.6984	0.0001	6.21E-07
14			0.00	0.000	0.035	0.3166	0.6982	0.0001	6.21E-07
15			0.01	0.000	0.036	0.3136	0.6980	0.0001	6.21E-07
16			0.00	0.000	0.028	0.3108	0.6978	0.0001	6.21E-07
17			0.00	0.000	0.025	0.3083	0.6975	0.0001	6.21E-07
18			0.00	0.000	0.024	0.3059	0.6973	0.0001	6.20E-07
19	*		0.85	0.000	0.032	0.3079	0.6971	0.0001	6.20E-07
20			0.00	0.653	0.000	0.3222	0.6969	0.0001	6.20E-07
21			0.00	0.000	0.131	0.3091	0.6967	0.0001	6.20E-07
22			0.00	0.000	0.148	0.2943	0.6965	0.0001	6.20E-07
23			0.00	0.000	0.126	0.2817	0.6963	0.0001	6.20E-07
24			0.00	0.000	0.046	0.2771	0.6961	0.0001	6.19E-07

25		0.00	0.000	0.001	0.2770	0.6959	0.0001	6.19E-07
26		0.00	0.000	0.000	0.2770	0.6957	0.0001	6.19E-07
27		0.00	0.000	0.000	0.2770	0.6955	0.0001	6.19E-07
28		0.00	0.000	0.000	0.2770	0.6953	0.0001	6.19E-07
29		0.00	0.000	0.000	0.2770	0.6951	0.0001	6.19E-07
30		0.00	0.000	0.000	0.2770	0.6949	0.0001	6.18E-07
31	*	0.00	0.000	0.000	0.2770	0.6947	0.0001	6.18E-07
32	*	0.00	0.000	0.000	0.2770	0.6945	0.0001	6.18E-07
33		0.00	0.000	0.000	0.2770	0.6943	0.0001	6.18E-07
34		0.00	0.000	0.000	0.2770	0.6941	0.0001	6.18E-07
35		0.00	0.000	0.000	0.2770	0.6939	0.0001	6.18E-07
36		0.00	0.000	0.000	0.2770	0.6937	0.0001	6.17E-07
37		0.00	0.000	0.000	0.2770	0.6935	0.0001	6.17E-07
38		0.00	0.000	0.000	0.2770	0.6933	0.0001	6.17E-07
39		0.52	0.329	0.029	0.2931	0.6931	0.0001	6.17E-07
40		0.00	0.000	0.007	0.2924	0.6929	0.0001	6.17E-07
41	*	0.00	0.000	0.011	0.2913	0.6927	0.0001	6.17E-07
42	*	0.02	0.000	0.020	0.2913	0.6925	0.0001	6.16E-07
43	*	0.28	0.000	0.009	0.2933	0.6923	0.0001	6.16E-07
44	*	0.00	0.000	0.041	0.2953	0.6921	0.0001	6.16E-07
45		0.00	0.004	0.089	0.3053	0.6919	0.0001	6.16E-07
46		0.00	0.000	0.011	0.3042	0.6917	0.0001	6.16E-07
47		0.00	0.000	0.010	0.3032	0.6915	0.0001	6.16E-07
48		0.00	0.000	0.010	0.3022	0.6913	0.0001	6.15E-07
49		0.23	0.083	0.022	0.3149	0.6911	0.0001	6.15E-07
50		0.00	0.000	0.088	0.3061	0.6909	0.0001	6.15E-07
51		0.00	0.000	0.010	0.3051	0.6906	0.0001	6.15E-07
52		0.00	0.000	0.011	0.3040	0.6904	0.0001	6.15E-07
53		0.32	0.153	0.026	0.3181	0.6902	0.0001	6.15E-07
54		0.97	0.736	0.113	0.3297	0.6900	0.0001	6.14E-07
55		0.00	0.000	0.065	0.3232	0.6898	0.0001	6.14E-07
56		0.00	0.000	0.039	0.3193	0.6896	0.0001	6.14E-07

57		0.02	0.000	0.058	0.3152	0.6894	0.0001	6.14E-07
58		0.00	0.000	0.081	0.3071	0.6892	0.0001	6.14E-07
59	*	0.04	0.000	0.039	0.3071	0.6890	0.0001	6.14E-07
60	*	0.00	0.000	0.063	0.3008	0.6888	0.0001	6.14E-07
61		0.03	0.000	0.087	0.2951	0.6886	0.0001	6.13E-07
62		0.04	0.000	0.130	0.2859	0.6884	0.0001	6.13E-07
63		0.00	0.000	0.047	0.2812	0.6882	0.0001	6.13E-07
64	*	0.00	0.000	0.023	0.2789	0.6880	0.0001	6.13E-07
65	*	0.00	0.000	0.000	0.2789	0.6878	0.0001	6.13E-07
66	*	0.01	0.000	0.023	0.2782	0.6876	0.0001	6.13E-07
67		0.09	0.000	0.019	0.2852	0.6874	0.0001	6.12E-07
68		0.05	0.000	0.025	0.2881	0.6872	0.0001	6.12E-07
69		0.01	0.000	0.019	0.2867	0.6870	0.0001	6.12E-07
70		0.00	0.000	0.012	0.2855	0.6868	0.0001	6.12E-07
71		0.00	0.000	0.014	0.2841	0.6866	0.0001	6.12E-07
72		0.00	0.000	0.014	0.2827	0.6864	0.0001	6.12E-07
73	*	0.27	0.000	0.040	0.2847	0.6862	0.0001	6.11E-07
74		0.00	0.003	0.162	0.2894	0.6860	0.0001	6.11E-07
75		0.00	0.000	0.014	0.2880	0.6858	0.0001	6.11E-07
76		0.00	0.000	0.011	0.2869	0.6856	0.0001	6.11E-07
77		0.00	0.000	0.012	0.2856	0.6854	0.0001	6.11E-07
78		0.00	0.000	0.012	0.2845	0.6852	0.0001	6.11E-07
79		0.00	0.000	0.012	0.2833	0.6850	0.0001	6.10E-07
80		0.00	0.000	0.011	0.2822	0.6848	0.0001	6.10E-07
81		0.00	0.000	0.011	0.2811	0.6846	0.0001	6.10E-07
82		0.00	0.000	0.010	0.2801	0.6844	0.0001	6.10E-07
83	*	0.00	0.000	0.010	0.2791	0.6842	0.0001	6.10E-07
84		0.00	0.000	0.010	0.2781	0.6840	0.0001	6.10E-07
85		0.00	0.000	0.007	0.2774	0.6838	0.0001	6.09E-07
86		0.00	0.000	0.003	0.2771	0.6836	0.0001	6.09E-07
87	*	0.00	0.000	0.001	0.2770	0.6834	0.0001	6.09E-07
88		0.00	0.000	0.000	0.2770	0.6832	0.0001	6.09E-07

89	*	0.00	0.000	0.000	0.2770	0.6830	0.0001	6.09E-07
90		0.00	0.000	0.000	0.2770	0.6828	0.0001	6.09E-07
91		0.00	0.000	0.000	0.2770	0.6826	0.0001	6.08E-07
92		0.67	0.484	0.025	0.2933	0.6824	0.0001	6.08E-07
93		0.00	0.000	0.005	0.2928	0.6822	0.0001	6.08E-07
94		0.00	0.000	0.008	0.2919	0.6820	0.0001	6.08E-07
95		0.00	0.000	0.008	0.2911	0.6818	0.0001	6.08E-07
96		0.00	0.000	0.008	0.2903	0.6816	0.0001	6.08E-07
97		0.00	0.000	0.008	0.2895	0.6814	0.0001	6.07E-07
98		0.00	0.000	0.008	0.2887	0.6812	0.0001	6.07E-07
99		0.00	0.000	0.008	0.2879	0.6810	0.0001	6.07E-07
100		0.00	0.000	0.008	0.2871	0.6808	0.0001	6.07E-07
101		0.00	0.000	0.008	0.2864	0.6806	0.0001	6.07E-07
102		0.34	0.164	0.023	0.3013	0.6804	0.0001	6.07E-07
103		0.12	0.000	0.077	0.3060	0.6802	0.0001	6.07E-07
104		0.00	0.000	0.156	0.2904	0.6800	0.0001	6.06E-07
105		0.00	0.000	0.098	0.2807	0.6798	0.0001	6.06E-07
106		0.00	0.000	0.033	0.2774	0.6796	0.0001	6.06E-07
107		0.21	0.065	0.034	0.2890	0.6794	0.0001	6.06E-07
108		0.00	0.000	0.018	0.2875	0.6792	0.0001	6.06E-07
109		1.38	1.193	0.044	0.3022	0.6790	0.0001	6.06E-07
110		0.00	0.000	0.066	0.2956	0.6788	0.0001	6.05E-07
111		0.00	0.000	0.162	0.2795	0.6786	0.0001	6.05E-07
112		0.00	0.000	0.019	0.2776	0.6785	0.0001	6.05E-07
113		0.55	0.326	0.067	0.2930	0.6783	0.0001	6.05E-07
114		0.01	0.000	0.124	0.2815	0.6781	0.0001	6.05E-07
115		0.00	0.000	0.030	0.2784	0.6779	0.0001	6.05E-07
116		0.00	0.000	0.011	0.2774	0.6777	0.0001	6.04E-07
117		0.00	0.000	0.003	0.2771	0.6775	0.0001	6.04E-07
118		0.07	0.000	0.016	0.2827	0.6773	0.0001	6.04E-07
119		0.01	0.000	0.019	0.2819	0.6771	0.0001	6.04E-07
120		0.05	0.000	0.029	0.2843	0.6769	0.0001	6.04E-07

121	0.01	0.000	0.019	0.2831	0.6767	0.0001	6.04E-07
122	0.41	0.237	0.035	0.2971	0.6765	0.0001	6.03E-07
123	0.49	0.211	0.159	0.3086	0.6763	0.0001	6.03E-07
124	0.33	0.125	0.276	0.3013	0.6761	0.0001	6.03E-07
125	0.07	0.000	0.185	0.2902	0.6759	0.0001	6.03E-07
126	0.00	0.000	0.104	0.2801	0.6757	0.0001	6.03E-07
127	2.03	1.810	0.068	0.2952	0.6755	0.0001	6.03E-07
128	0.00	0.000	0.090	0.2863	0.6753	0.0001	6.02E-07
129	0.01	0.000	0.076	0.2797	0.6753	0.0001	6.02E-07
130	0.26	0.106	0.091	0.2863	0.6752	0.0001	6.02E-07
131	0.00	0.000	0.068	0.2796	0.6750	0.0001	6.02E-07
132	0.00	0.000	0.021	0.2775	0.6748	0.0001	6.02E-07
133	0.00	0.000	0.003	0.2771	0.6746	0.0001	6.02E-07
134	0.00	0.000	0.001	0.2770	0.6744	0.0001	6.02E-07
135	0.02	0.000	0.013	0.2777	0.6742	0.0001	6.02E-07
136	0.00	0.000	0.003	0.2774	0.6740	0.0001	6.01E-07
137	0.02	0.000	0.015	0.2781	0.6738	0.0001	6.01E-07
138	0.00	0.000	0.003	0.2778	0.6736	0.0001	6.01E-07
139	0.00	0.000	0.005	0.2774	0.6734	0.0001	6.01E-07
140	0.00	0.000	0.003	0.2771	0.6732	0.0001	6.01E-07
141	0.05	0.000	0.015	0.2807	0.6730	0.0001	6.01E-07
142	0.00	0.000	0.004	0.2805	0.6728	0.0001	6.00E-07
143	0.00	0.000	0.009	0.2796	0.6726	0.0001	6.00E-07
144	0.00	0.000	0.007	0.2789	0.6724	0.0001	6.00E-07
145	0.00	0.000	0.005	0.2784	0.6722	0.0001	6.00E-07
146	0.00	0.000	0.004	0.2781	0.6720	0.0001	6.00E-07
147	0.01	0.000	0.010	0.2780	0.6718	0.0001	6.00E-07
148	0.00	0.000	0.002	0.2778	0.6716	0.0001	5.99E-07
149	0.00	0.000	0.003	0.2775	0.6714	0.0001	5.99E-07
150	0.01	0.000	0.010	0.2776	0.6712	0.0001	5.99E-07
151	0.00	0.000	0.002	0.2774	0.6710	0.0001	5.99E-07
152	0.00	0.000	0.003	0.2771	0.6708	0.0001	5.99E-07

153	0.18	0.027	0.022	0.2898	0.6707	0.0001	5.99E-07
154	0.00	0.000	0.008	0.2890	0.6705	0.0001	5.99E-07
155	0.18	0.041	0.023	0.3010	0.6703	0.0001	5.98E-07
156	1.23	1.089	0.030	0.3123	0.6701	0.0001	5.98E-07
157	0.67	0.386	0.167	0.3236	0.6699	0.0001	5.98E-07
158	0.03	0.000	0.094	0.3174	0.6697	0.0001	5.98E-07
159	0.01	0.000	0.182	0.2997	0.6695	0.0001	5.98E-07
160	0.00	0.000	0.112	0.2885	0.6693	0.0001	5.98E-07
161	0.04	0.000	0.060	0.2863	0.6691	0.0001	5.97E-07
162	0.00	0.000	0.043	0.2823	0.6689	0.0001	5.97E-07
163	0.00	0.000	0.030	0.2793	0.6687	0.0001	5.97E-07
164	3.18	2.984	0.050	0.2943	0.6685	0.0001	5.97E-07
165	0.42	0.133	0.312	0.2915	0.6683	0.0001	5.97E-07
166	0.35	0.092	0.309	0.2864	0.6681	0.0001	5.97E-07
167	0.08	0.000	0.086	0.2859	0.6679	0.0001	5.96E-07
168	0.01	0.000	0.062	0.2806	0.6677	0.0001	5.96E-07
169	0.00	0.000	0.021	0.2785	0.6675	0.0001	5.96E-07
170	0.00	0.000	0.012	0.2773	0.6673	0.0001	5.96E-07
171	0.00	0.000	0.003	0.2771	0.6671	0.0001	5.96E-07
172	0.00	0.000	0.001	0.2770	0.6669	0.0001	5.96E-07
173	0.00	0.000	0.000	0.2770	0.6667	0.0001	5.95E-07
174	0.00	0.000	0.000	0.2770	0.6665	0.0001	5.95E-07
175	0.00	0.000	0.003	0.2770	0.6664	0.0001	5.95E-07
176	0.00	0.000	0.000	0.2770	0.6662	0.0001	5.95E-07
177	0.00	0.000	0.000	0.2770	0.6660	0.0001	5.95E-07
178	0.00	0.000	0.000	0.2770	0.6658	0.0001	5.95E-07
179	0.18	0.034	0.022	0.2897	0.6656	0.0001	5.95E-07
180	0.00	0.000	0.011	0.2886	0.6654	0.0001	5.94E-07
181	0.00	0.000	0.016	0.2870	0.6652	0.0001	5.94E-07
182	0.25	0.092	0.029	0.2996	0.6650	0.0001	5.94E-07
183	0.06	0.000	0.025	0.3036	0.6648	0.0001	5.94E-07
184	0.00	0.000	0.016	0.3020	0.6646	0.0001	5.94E-07

185	0.00	0.000	0.017	0.3003	0.6644	0.0001	5.94E-07
186	0.00	0.000	0.014	0.2989	0.6642	0.0001	5.93E-07
187	0.00	0.000	0.013	0.2975	0.6640	0.0001	5.93E-07
188	0.44	0.271	0.030	0.3113	0.6638	0.0001	5.93E-07
189	0.36	0.165	0.132	0.3178	0.6636	0.0001	5.93E-07
190	0.07	0.000	0.092	0.3161	0.6634	0.0001	5.93E-07
191	0.32	0.133	0.192	0.3155	0.6632	0.0001	5.93E-07
192	0.00	0.000	0.172	0.2982	0.6630	0.0001	5.92E-07
193	0.00	0.000	0.105	0.2877	0.6629	0.0001	5.92E-07
194	0.30	0.114	0.148	0.2916	0.6627	0.0001	5.92E-07
195	0.00	0.000	0.104	0.2812	0.6625	0.0001	5.92E-07
196	0.00	0.000	0.032	0.2780	0.6623	0.0001	5.92E-07
197	0.00	0.000	0.008	0.2773	0.6621	0.0001	5.92E-07
198	0.00	0.000	0.002	0.2771	0.6619	0.0001	5.92E-07
199	1.05	0.846	0.047	0.2932	0.6617	0.0001	5.91E-07
200	0.07	0.000	0.059	0.2945	0.6615	0.0001	5.91E-07
201	0.05	0.000	0.134	0.2862	0.6613	0.0001	5.91E-07
202	0.00	0.000	0.054	0.2808	0.6611	0.0001	5.91E-07
203	0.00	0.000	0.027	0.2781	0.6609	0.0001	5.91E-07
204	0.00	0.000	0.008	0.2773	0.6607	0.0001	5.91E-07
205	0.00	0.000	0.002	0.2771	0.6605	0.0001	5.90E-07
206	0.10	0.000	0.018	0.2856	0.6603	0.0001	5.90E-07
207	0.20	0.053	0.030	0.2976	0.6601	0.0001	5.90E-07
208	0.31	0.152	0.042	0.3090	0.6600	0.0001	5.90E-07
209	0.02	0.000	0.171	0.2944	0.6598	0.0001	5.90E-07
210	0.46	0.265	0.044	0.3091	0.6596	0.0001	5.90E-07
211	0.03	0.000	0.153	0.2965	0.6594	0.0001	5.89E-07
212	0.25	0.096	0.044	0.3078	0.6592	0.0001	5.89E-07
213	0.17	0.030	0.133	0.3088	0.6590	0.0001	5.89E-07
214	0.00	0.000	0.140	0.2948	0.6588	0.0001	5.89E-07
215	0.01	0.000	0.089	0.2867	0.6586	0.0001	5.89E-07
216	0.51	0.230	0.142	0.3002	0.6584	0.0001	5.89E-07

217	0.17	0.003	0.237	0.2929	0.6582	0.0001	5.89E-07
218	0.00	0.000	0.047	0.2881	0.6580	0.0001	5.88E-07
219	0.00	0.000	0.042	0.2839	0.6578	0.0001	5.88E-07
220	0.00	0.000	0.036	0.2803	0.6576	0.0001	5.88E-07
221	0.00	0.000	0.025	0.2778	0.6574	0.0001	5.88E-07
222	0.00	0.000	0.006	0.2772	0.6573	0.0001	5.88E-07
223	0.01	0.000	0.007	0.2771	0.6571	0.0001	5.88E-07
224	0.00	0.000	0.000	0.2770	0.6569	0.0001	5.87E-07
225	0.00	0.000	0.005	0.2770	0.6567	0.0001	5.87E-07
226	0.20	0.049	0.027	0.2894	0.6565	0.0001	5.87E-07
227	0.00	0.000	0.016	0.2879	0.6563	0.0001	5.87E-07
228	0.00	0.000	0.025	0.2853	0.6561	0.0001	5.87E-07
229	0.00	0.000	0.019	0.2835	0.6559	0.0001	5.87E-07
230	0.00	0.000	0.018	0.2816	0.6557	0.0001	5.86E-07
231	0.38	0.197	0.041	0.2956	0.6555	0.0001	5.86E-07
232	0.24	0.074	0.152	0.2974	0.6553	0.0001	5.86E-07
233	0.06	0.000	0.024	0.3012	0.6551	0.0001	5.86E-07
234	0.00	0.000	0.067	0.2945	0.6550	0.0001	5.86E-07
235	0.00	0.000	0.016	0.2929	0.6548	0.0001	5.86E-07
236	0.39	0.219	0.035	0.3068	0.6546	0.0001	5.86E-07
237	1.15	0.823	0.220	0.3179	0.6544	0.0001	5.85E-07
238	0.07	0.000	0.076	0.3169	0.6542	0.0001	5.85E-07
239	0.00	0.000	0.069	0.3100	0.6540	0.0001	5.85E-07
240	0.00	0.000	0.135	0.2965	0.6538	0.0001	5.85E-07
241	0.27	0.099	0.110	0.3021	0.6536	0.0001	5.85E-07
242	0.02	0.000	0.102	0.2938	0.6534	0.0001	5.85E-07
243	0.67	0.326	0.201	0.3080	0.6532	0.0001	5.84E-07
244	0.34	0.154	0.100	0.3166	0.6530	0.0001	5.84E-07
245	0.09	0.000	0.137	0.3121	0.6529	0.0001	5.84E-07
246	0.04	0.000	0.122	0.3034	0.6527	0.0001	5.84E-07
247	0.00	0.000	0.109	0.2925	0.6525	0.0001	5.84E-07
248	0.00	0.000	0.110	0.2815	0.6523	0.0001	5.84E-07

249	0.00	0.000	0.035	0.2781	0.6521	0.0001	5.83E-07
250	0.00	0.000	0.009	0.2772	0.6519	0.0001	5.83E-07
251	0.00	0.000	0.002	0.2770	0.6517	0.0001	5.83E-07
252	0.00	0.000	0.000	0.2770	0.6515	0.0001	5.83E-07
253	0.04	0.000	0.017	0.2793	0.6513	0.0001	5.83E-07
254	0.58	0.395	0.047	0.2932	0.6511	0.0001	5.83E-07
255	0.01	0.000	0.089	0.2857	0.6509	0.0001	5.83E-07
256	1.25	1.047	0.045	0.3011	0.6508	0.0001	5.82E-07
257	0.36	0.136	0.183	0.3053	0.6506	0.0001	5.82E-07
258	0.11	0.000	0.084	0.3077	0.6504	0.0001	5.82E-07
259	0.01	0.000	0.066	0.3023	0.6502	0.0001	5.82E-07
260	0.52	0.231	0.150	0.3163	0.6500	0.0001	5.82E-07
261	0.00	0.000	0.109	0.3054	0.6498	0.0001	5.82E-07
262	0.00	0.000	0.094	0.2960	0.6496	0.0001	5.81E-07
263	0.00	0.000	0.100	0.2860	0.6494	0.0001	5.81E-07
264	0.00	0.000	0.075	0.2785	0.6492	0.0001	5.81E-07
265	0.00	0.000	0.011	0.2774	0.6490	0.0001	5.81E-07
266	0.00	0.000	0.003	0.2771	0.6489	0.0001	5.81E-07
267	0.00	0.000	0.001	0.2770	0.6487	0.0001	5.81E-07
268	0.00	0.000	0.000	0.2770	0.6485	0.0001	5.81E-07
269	0.00	0.000	0.000	0.2770	0.6483	0.0001	5.80E-07
270	0.00	0.000	0.000	0.2770	0.6481	0.0001	5.80E-07
271	0.00	0.000	0.000	0.2770	0.6479	0.0001	5.80E-07
272	0.00	0.000	0.000	0.2770	0.6477	0.0001	5.80E-07
273	0.62	0.422	0.039	0.2933	0.6475	0.0001	5.80E-07
274	0.40	0.241	0.038	0.3049	0.6473	0.0001	5.80E-07
275	0.12	0.002	0.056	0.3112	0.6472	0.0001	5.79E-07
276	0.00	0.000	0.108	0.3004	0.6470	0.0001	5.79E-07
277	0.00	0.000	0.084	0.2920	0.6468	0.0001	5.79E-07
278	0.00	0.000	0.055	0.2864	0.6466	0.0001	5.79E-07
279	0.00	0.000	0.045	0.2819	0.6464	0.0001	5.79E-07
280	0.00	0.000	0.038	0.2781	0.6462	0.0001	5.79E-07

281	0.00	0.000	0.009	0.2771	0.6460	0.0001	5.79E-07
282	0.00	0.000	0.001	0.2770	0.6458	0.0001	5.78E-07
283	0.00	0.000	0.000	0.2770	0.6456	0.0001	5.78E-07
284	0.00	0.000	0.000	0.2770	0.6455	0.0001	5.78E-07
285	0.00	0.000	0.000	0.2770	0.6453	0.0001	5.78E-07
286	0.00	0.000	0.000	0.2770	0.6451	0.0001	5.78E-07
287	0.31	0.144	0.037	0.2904	0.6449	0.0001	5.78E-07
288	1.05	0.898	0.036	0.3020	0.6447	0.0001	5.77E-07
289	0.43	0.204	0.108	0.3136	0.6445	0.0001	5.77E-07
290	0.00	0.000	0.040	0.3096	0.6443	0.0001	5.77E-07
291	0.00	0.000	0.077	0.3019	0.6441	0.0001	5.77E-07
292	0.00	0.000	0.104	0.2915	0.6440	0.0001	5.77E-07
293	0.05	0.000	0.058	0.2902	0.6438	0.0001	5.77E-07
294	0.00	0.000	0.072	0.2830	0.6436	0.0001	5.77E-07
295	0.00	0.000	0.047	0.2784	0.6434	0.0001	5.76E-07
296	0.00	0.000	0.010	0.2773	0.6432	0.0001	5.76E-07
297	0.00	0.000	0.003	0.2771	0.6430	0.0001	5.76E-07
298	0.00	0.000	0.000	0.2770	0.6428	0.0001	5.76E-07
299	0.01	0.000	0.012	0.2772	0.6426	0.0001	5.76E-07
300	0.00	0.000	0.001	0.2771	0.6424	0.0001	5.76E-07
301	0.00	0.000	0.001	0.2770	0.6423	0.0001	5.75E-07
302	0.00	0.000	0.000	0.2770	0.6421	0.0001	5.75E-07
303	0.00	0.000	0.000	0.2770	0.6419	0.0001	5.75E-07
304	0.00	0.000	0.000	0.2770	0.6417	0.0001	5.75E-07
305	0.00	0.000	0.000	0.2770	0.6415	0.0001	5.75E-07
306	0.00	0.000	0.000	0.2770	0.6413	0.0001	5.75E-07
307	0.00	0.000	0.000	0.2770	0.6411	0.0001	5.75E-07
308	0.14	0.000	0.019	0.2892	0.6409	0.0001	5.74E-07
309	0.00	0.000	0.007	0.2885	0.6408	0.0001	5.74E-07
310	0.00	0.000	0.008	0.2877	0.6406	0.0001	5.74E-07
311	0.00	0.000	0.010	0.2867	0.6404	0.0001	5.74E-07
312	0.00	0.000	0.011	0.2856	0.6402	0.0001	5.74E-07

313		0.00	0.000	0.010	0.2846	0.6400	0.0001	5.74E-07
314		0.00	0.000	0.010	0.2836	0.6398	0.0001	5.73E-07
315		0.00	0.000	0.010	0.2826	0.6396	0.0001	5.73E-07
316		0.00	0.000	0.010	0.2816	0.6394	0.0001	5.73E-07
317		0.14	0.000	0.025	0.2929	0.6393	0.0001	5.73E-07
318		0.45	0.295	0.029	0.3051	0.6391	0.0001	5.73E-07
319		0.00	0.000	0.014	0.3041	0.6389	0.0001	5.73E-07
320	*	0.05	0.000	0.026	0.3060	0.6387	0.0001	5.73E-07
321		0.07	0.000	0.028	0.3111	0.6385	0.0001	5.72E-07
322		0.00	0.000	0.010	0.3101	0.6383	0.0001	5.72E-07
323		0.00	0.000	0.009	0.3092	0.6382	0.0001	5.72E-07
324		0.00	0.000	0.008	0.3084	0.6380	0.0001	5.72E-07
325	*	0.00	0.000	0.000	0.3084	0.6378	0.0001	5.72E-07
326	*	0.00	0.000	0.000	0.3084	0.6376	0.0001	5.72E-07
327		0.00	0.000	0.008	0.3076	0.6374	0.0001	5.71E-07
328		0.75	0.584	0.026	0.3213	0.6372	0.0001	5.71E-07
329		0.00	0.000	0.073	0.3140	0.6370	0.0001	5.71E-07
330		0.00	0.000	0.068	0.3073	0.6369	0.0001	5.71E-07
331	*	0.00	0.000	0.030	0.3042	0.6367	0.0001	5.71E-07
332		0.00	0.000	0.072	0.2971	0.6365	0.0001	5.71E-07
333		0.00	0.000	0.087	0.2884	0.6363	0.0001	5.71E-07
334		0.03	0.000	0.061	0.2852	0.6361	0.0001	5.70E-07
335	*	0.00	0.000	0.034	0.2819	0.6359	0.0001	5.70E-07
336	*	0.77	0.000	0.034	0.2838	0.6357	0.0001	5.70E-07
337		0.00	0.575	0.000	0.2976	0.6356	0.0001	5.70E-07
338	*	0.00	0.000	0.038	0.2938	0.6354	0.0001	5.70E-07
339	*	0.00	0.000	0.000	0.2938	0.6352	0.0001	5.70E-07
340	*	0.00	0.000	0.000	0.2938	0.6350	0.0001	5.69E-07
341	*	0.00	0.000	0.000	0.2938	0.6348	0.0001	5.69E-07
342	*	0.00	0.000	0.000	0.2938	0.6346	0.0001	5.69E-07
343	*	0.00	0.000	0.000	0.2938	0.6344	0.0001	5.69E-07
344	*	0.00	0.000	0.000	0.2939	0.6343	0.0001	5.69E-07

345	*		0.00	0.000	0.000	0.2939	0.6341	0.0001	5.69E-07
346	*		0.00	0.000	0.000	0.2939	0.6339	0.0001	5.69E-07
347	*		1.57	0.000	0.000	0.2958	0.6337	0.0001	5.68E-07
348	*		0.15	0.000	0.016	0.2978	0.6335	0.0001	5.68E-07
349	*		0.00	0.000	0.035	0.2998	0.6333	0.0001	5.68E-07
350	*		0.00	0.000	0.039	0.3018	0.6331	0.0001	5.68E-07
351			0.00	0.028	0.028	0.3145	0.6330	0.0001	5.68E-07
352			0.00	0.645	0.000	0.3261	0.6328	0.0001	5.68E-07
353			0.20	0.695	0.000	0.3378	0.6326	0.0001	5.68E-07
354			0.26	0.127	0.093	0.3423	0.6324	0.0001	5.67E-07
355			0.08	0.002	0.108	0.3395	0.6322	0.0001	5.67E-07
356			0.00	0.000	0.042	0.3353	0.6320	0.0001	5.67E-07
357			0.00	0.000	0.054	0.3300	0.6319	0.0001	5.67E-07
358	*		0.00	0.000	0.030	0.3270	0.6317	0.0001	5.67E-07
359			0.00	0.000	0.041	0.3229	0.6315	0.0001	5.67E-07
360	*		0.00	0.000	0.000	0.3229	0.6313	0.0001	5.66E-07
361	*	*	0.00	0.000	0.000	0.3229	0.6311	0.0001	5.66E-07
362		*	0.00	0.000	0.000	0.3229	0.6309	0.0001	5.66E-07
363		*	0.00	0.000	0.000	0.3229	0.6307	0.0001	5.66E-07
364			0.00	0.000	0.068	0.3161	0.6306	0.0001	5.66E-07
365			0.00	0.000	0.054	0.3109	0.6304	0.0001	5.66E-07

* = Frozen (air or soil)

Annual Totals for Year 11			
	inches	cubic feet	percent
Precipitation	37.15	134,843.1	100.00
Runoff	22.532	81,791.6	60.66
Evapotranspiration	15.445	56,064.1	41.58
Recirculation into Layer 1	0.0275	99.8	0.07
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0275	99.8	0.07
Percolation/Leakage through Layer 5	0.000217	0.7864	0.00
Average Head on Top of Layer 4	0.6644	---	---
Change in Water Storage	-0.8301	-3,013.4	-2.23
Soil Water at Start of Year	1,407.8381	5,110,452.2	3789.92
Soil Water at End of Year	1,407.0079	5,107,438.8	3787.69
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0275	-99.8	-0.07

Daily Output for Year 12

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.01	0.000	0.011	0.3109	0.6302	0.0001	5.66E-07
2	*	*	0.00	0.000	0.000	0.3109	0.6300	0.0001	5.65E-07
3	*	*	0.00	0.000	0.000	0.3109	0.6298	0.0001	5.65E-07
4		*	0.00	0.000	0.000	0.3109	0.6296	0.0001	5.65E-07
5	*	*	0.00	0.000	0.000	0.3109	0.6295	0.0001	5.65E-07
6	*	*	0.00	0.000	0.000	0.3109	0.6293	0.0001	5.65E-07
7	*	*	0.00	0.000	0.000	0.3109	0.6291	0.0001	5.65E-07
8	*	*	0.00	0.000	0.000	0.3109	0.6289	0.0001	5.64E-07
9		*	0.00	0.000	0.000	0.3109	0.6287	0.0001	5.64E-07
10		*	0.20	0.137	0.014	0.3156	0.6285	0.0001	5.64E-07
11			0.00	0.000	0.048	0.3108	0.6284	0.0001	5.64E-07
12			0.00	0.000	0.087	0.3020	0.6282	0.0001	5.64E-07
13			0.00	0.000	0.052	0.2969	0.6280	0.0001	5.64E-07
14	*		0.00	0.000	0.000	0.2969	0.6278	0.0001	5.64E-07
15	*		0.00	0.000	0.000	0.2969	0.6276	0.0001	5.63E-07
16			0.00	0.000	0.046	0.2923	0.6274	0.0001	5.63E-07
17	*		0.00	0.000	0.031	0.2892	0.6272	0.0001	5.63E-07
18			0.00	0.000	0.064	0.2829	0.6271	0.0001	5.63E-07
19			0.54	0.273	0.131	0.2967	0.6269	0.0001	5.63E-07
20			0.10	0.000	0.098	0.2973	0.6267	0.0001	5.63E-07
21			0.00	0.000	0.055	0.2918	0.6265	0.0001	5.63E-07
22			0.00	0.000	0.112	0.2807	0.6263	0.0001	5.62E-07
23			0.00	0.000	0.032	0.2775	0.6261	0.0001	5.62E-07
24			0.00	0.000	0.004	0.2771	0.6260	0.0001	5.62E-07

25	*	0.00	0.000	0.000	0.2771	0.6258	0.0001	5.62E-07
26	*	0.00	0.000	0.001	0.2770	0.6256	0.0001	5.62E-07
27		0.11	0.000	0.018	0.2859	0.6254	0.0001	5.62E-07
28	*	0.00	0.000	0.013	0.2846	0.6252	0.0001	5.61E-07
29	*	0.00	0.000	0.000	0.2846	0.6251	0.0001	5.61E-07
30	*	0.00	0.000	0.000	0.2846	0.6249	0.0001	5.61E-07
31	*	0.00	0.000	0.000	0.2846	0.6247	0.0001	5.61E-07
32	*	0.00	0.000	0.000	0.2846	0.6245	0.0001	5.61E-07
33	*	0.00	0.000	0.000	0.2846	0.6243	0.0001	5.61E-07
34	*	0.67	0.000	0.023	0.2866	0.6241	0.0001	5.61E-07
35		0.00	0.501	0.000	0.2993	0.6240	0.0001	5.60E-07
36	*	0.65	0.000	0.034	0.3013	0.6238	0.0001	5.60E-07
37	*	0.00	0.000	0.037	0.3033	0.6236	0.0001	5.60E-07
38		0.00	0.396	0.015	0.3160	0.6234	0.0001	5.60E-07
39		0.00	0.000	0.063	0.3097	0.6232	0.0001	5.60E-07
40		1.00	0.753	0.116	0.3234	0.6230	0.0001	5.60E-07
41		0.72	0.527	0.073	0.3350	0.6229	0.0001	5.60E-07
42	*	0.00	0.000	0.043	0.3307	0.6227	0.0001	5.59E-07
43	*	0.00	0.000	0.000	0.3307	0.6225	0.0001	5.59E-07
44		0.00	0.000	0.084	0.3223	0.6223	0.0001	5.59E-07
45		0.00	0.000	0.082	0.3141	0.6221	0.0001	5.59E-07
46		0.02	0.000	0.058	0.3103	0.6220	0.0001	5.59E-07
47		0.00	0.000	0.095	0.3008	0.6218	0.0001	5.59E-07
48		0.00	0.000	0.082	0.2925	0.6216	0.0001	5.58E-07
49		0.00	0.000	0.085	0.2841	0.6214	0.0001	5.58E-07
50		0.00	0.000	0.058	0.2783	0.6212	0.0001	5.58E-07
51		0.00	0.000	0.010	0.2773	0.6210	0.0001	5.58E-07
52		0.00	0.000	0.003	0.2770	0.6209	0.0001	5.58E-07
53		0.00	0.000	0.000	0.2770	0.6207	0.0001	5.58E-07
54		0.00	0.000	0.000	0.2770	0.6205	0.0001	5.58E-07
55		0.00	0.000	0.000	0.2770	0.6203	0.0001	5.57E-07
56		0.00	0.000	0.000	0.2770	0.6201	0.0001	5.57E-07

57		0.00	0.000	0.000	0.2770	0.6200	0.0001	5.57E-07
58		0.23	0.081	0.024	0.2896	0.6198	0.0001	5.57E-07
59		1.13	0.974	0.035	0.3013	0.6196	0.0001	5.57E-07
60		0.00	0.000	0.074	0.2938	0.6194	0.0001	5.57E-07
61		0.00	0.000	0.096	0.2842	0.6192	0.0001	5.57E-07
62		0.00	0.000	0.053	0.2789	0.6191	0.0001	5.56E-07
63		0.00	0.000	0.014	0.2775	0.6189	0.0001	5.56E-07
64		0.00	0.000	0.004	0.2771	0.6187	0.0001	5.56E-07
65		0.51	0.302	0.056	0.2925	0.6185	0.0001	5.56E-07
66		0.06	0.000	0.030	0.2952	0.6183	0.0001	5.56E-07
67	*	0.00	0.000	0.000	0.2952	0.6181	0.0001	5.56E-07
68	*	0.08	0.000	0.037	0.2972	0.6180	0.0001	5.55E-07
69		0.00	0.000	0.070	0.2930	0.6178	0.0001	5.55E-07
70	*	0.19	0.000	0.070	0.2950	0.6176	0.0001	5.55E-07
71		0.10	0.005	0.139	0.3010	0.6174	0.0001	5.55E-07
72		0.00	0.000	0.090	0.2920	0.6172	0.0001	5.55E-07
73		0.00	0.000	0.021	0.2899	0.6171	0.0001	5.55E-07
74		0.00	0.000	0.019	0.2880	0.6169	0.0001	5.55E-07
75		0.00	0.000	0.017	0.2863	0.6167	0.0001	5.54E-07
76		0.06	0.000	0.030	0.2897	0.6165	0.0001	5.54E-07
77		0.22	0.071	0.033	0.3017	0.6163	0.0001	5.54E-07
78		0.24	0.091	0.108	0.3060	0.6162	0.0001	5.54E-07
79		0.00	0.000	0.076	0.2983	0.6160	0.0001	5.54E-07
80		0.00	0.000	0.079	0.2904	0.6158	0.0001	5.54E-07
81		0.00	0.000	0.036	0.2868	0.6156	0.0001	5.54E-07
82	*	0.00	0.000	0.000	0.2868	0.6154	0.0001	5.53E-07
83		0.28	0.117	0.052	0.2977	0.6153	0.0001	5.53E-07
84		0.71	0.541	0.049	0.3093	0.6151	0.0001	5.53E-07
85		0.56	0.305	0.138	0.3209	0.6149	0.0001	5.53E-07
86		0.42	0.206	0.302	0.3121	0.6147	0.0001	5.53E-07
87		0.00	0.000	0.135	0.2985	0.6145	0.0001	5.53E-07
88		0.13	0.000	0.159	0.2959	0.6144	0.0001	5.53E-07

89		0.00	0.000	0.146	0.2813	0.6142	0.0001	5.52E-07
90		0.00	0.000	0.031	0.2783	0.6140	0.0001	5.52E-07
91		0.00	0.000	0.010	0.2773	0.6138	0.0001	5.52E-07
92		0.00	0.000	0.003	0.2771	0.6136	0.0001	5.52E-07
93		0.00	0.000	0.000	0.2770	0.6135	0.0001	5.52E-07
94		0.00	0.000	0.000	0.2770	0.6133	0.0001	5.52E-07
95		0.00	0.000	0.000	0.2770	0.6131	0.0001	5.52E-07
96		0.00	0.000	0.000	0.2770	0.6129	0.0001	5.51E-07
97		0.00	0.000	0.000	0.2770	0.6128	0.0001	5.51E-07
98		0.12	0.000	0.016	0.2870	0.6126	0.0001	5.51E-07
99	*	0.00	0.000	0.009	0.2861	0.6124	0.0001	5.51E-07
100		0.00	0.000	0.010	0.2851	0.6122	0.0001	5.51E-07
101		0.00	0.000	0.012	0.2838	0.6120	0.0001	5.51E-07
102		0.00	0.000	0.012	0.2826	0.6119	0.0001	5.50E-07
103		0.15	0.008	0.026	0.2937	0.6117	0.0001	5.50E-07
104	*	0.01	0.000	0.018	0.2928	0.6115	0.0001	5.50E-07
105	*	0.00	0.000	0.000	0.2929	0.6113	0.0001	5.50E-07
106		0.00	0.000	0.012	0.2917	0.6111	0.0001	5.50E-07
107		0.00	0.000	0.011	0.2906	0.6110	0.0001	5.50E-07
108		0.00	0.000	0.011	0.2895	0.6108	0.0001	5.50E-07
109		0.00	0.000	0.011	0.2884	0.6106	0.0001	5.49E-07
110		0.00	0.000	0.010	0.2874	0.6104	0.0001	5.49E-07
111		0.00	0.000	0.010	0.2864	0.6102	0.0001	5.49E-07
112		0.00	0.000	0.010	0.2854	0.6101	0.0001	5.49E-07
113		0.00	0.000	0.010	0.2844	0.6099	0.0001	5.49E-07
114		0.01	0.000	0.018	0.2838	0.6097	0.0001	5.49E-07
115		0.08	0.000	0.024	0.2898	0.6095	0.0001	5.49E-07
116		0.01	0.000	0.018	0.2890	0.6094	0.0001	5.48E-07
117		0.00	0.000	0.011	0.2879	0.6092	0.0001	5.48E-07
118		0.00	0.000	0.011	0.2868	0.6090	0.0001	5.48E-07
119		0.02	0.000	0.021	0.2867	0.6088	0.0001	5.48E-07
120		0.50	0.335	0.027	0.3002	0.6087	0.0001	5.48E-07

121		0.01	0.000	0.014	0.2994	0.6085	0.0001	5.48E-07
122		0.00	0.000	0.010	0.2984	0.6083	0.0001	5.48E-07
123		0.00	0.000	0.009	0.2975	0.6081	0.0001	5.47E-07
124		0.00	0.000	0.009	0.2966	0.6079	0.0001	5.47E-07
125		0.00	0.000	0.008	0.2958	0.6078	0.0001	5.47E-07
126		0.00	0.000	0.008	0.2950	0.6076	0.0001	5.47E-07
127		1.58	1.404	0.026	0.3101	0.6074	0.0001	5.47E-07
128		0.00	0.000	0.102	0.2999	0.6072	0.0001	5.47E-07
129	*	0.00	0.000	0.060	0.2940	0.6071	0.0001	5.47E-07
130		0.00	0.000	0.129	0.2810	0.6069	0.0001	5.46E-07
131		0.00	0.000	0.030	0.2780	0.6067	0.0001	5.46E-07
132		0.00	0.000	0.008	0.2773	0.6065	0.0001	5.46E-07
133		0.00	0.000	0.006	0.2771	0.6063	0.0001	5.46E-07
134	*	0.01	0.000	0.010	0.2770	0.6062	0.0001	5.46E-07
135		0.00	0.000	0.000	0.2770	0.6060	0.0001	5.46E-07
136		0.01	0.000	0.010	0.2770	0.6058	0.0001	5.45E-07
137		0.04	0.000	0.016	0.2792	0.6056	0.0001	5.45E-07
138		0.00	0.000	0.002	0.2789	0.6055	0.0001	5.45E-07
139		0.25	0.093	0.027	0.2923	0.6053	0.0001	5.45E-07
140		0.16	0.024	0.024	0.3031	0.6051	0.0001	5.45E-07
141		0.00	0.000	0.009	0.3023	0.6049	0.0001	5.45E-07
142		0.00	0.000	0.014	0.3008	0.6047	0.0001	5.45E-07
143		0.00	0.000	0.014	0.2995	0.6046	0.0001	5.44E-07
144		0.00	0.000	0.014	0.2981	0.6044	0.0001	5.44E-07
145		0.00	0.000	0.013	0.2968	0.6042	0.0001	5.44E-07
146		0.00	0.000	0.013	0.2955	0.6040	0.0001	5.44E-07
147		0.00	0.000	0.012	0.2943	0.6039	0.0001	5.44E-07
148		0.00	0.000	0.012	0.2931	0.6037	0.0001	5.44E-07
149		0.00	0.000	0.012	0.2919	0.6035	0.0001	5.44E-07
150		0.00	0.000	0.012	0.2906	0.6033	0.0001	5.43E-07
151		1.23	1.047	0.032	0.3057	0.6032	0.0001	5.43E-07
152		0.13	0.000	0.081	0.3104	0.6030	0.0001	5.43E-07

153	0.00	0.000	0.211	0.2893	0.6028	0.0001	5.43E-07
154	0.00	0.000	0.113	0.2781	0.6026	0.0001	5.43E-07
155	0.00	0.000	0.008	0.2772	0.6025	0.0001	5.43E-07
156	0.66	0.423	0.073	0.2931	0.6023	0.0001	5.43E-07
157	0.00	0.000	0.056	0.2875	0.6021	0.0001	5.42E-07
158	0.26	0.095	0.050	0.2988	0.6019	0.0001	5.42E-07
159	0.05	0.000	0.085	0.2958	0.6018	0.0001	5.42E-07
160	0.72	0.466	0.127	0.3090	0.6016	0.0001	5.42E-07
161	0.10	0.001	0.107	0.3087	0.6014	0.0001	5.42E-07
162	0.10	0.000	0.208	0.2981	0.6012	0.0001	5.42E-07
163	0.27	0.087	0.171	0.2997	0.6011	0.0001	5.42E-07
164	0.84	0.578	0.150	0.3111	0.6009	0.0001	5.41E-07
165	0.00	0.000	0.192	0.2919	0.6007	0.0001	5.41E-07
166	0.00	0.000	0.132	0.2786	0.6005	0.0001	5.41E-07
167	0.27	0.109	0.078	0.2867	0.6004	0.0001	5.41E-07
168	0.03	0.000	0.090	0.2811	0.6002	0.0001	5.41E-07
169	0.00	0.000	0.027	0.2784	0.6000	0.0001	5.41E-07
170	0.03	0.000	0.026	0.2787	0.5998	0.0001	5.41E-07
171	0.33	0.137	0.055	0.2928	0.5997	0.0001	5.40E-07
172	0.50	0.334	0.049	0.3043	0.5995	0.0001	5.40E-07
173	0.00	0.000	0.047	0.2997	0.5993	0.0001	5.40E-07
174	0.24	0.090	0.088	0.3063	0.5991	0.0001	5.40E-07
175	0.00	0.000	0.144	0.2919	0.5989	0.0001	5.40E-07
176	0.00	0.000	0.085	0.2834	0.5988	0.0001	5.40E-07
177	0.00	0.000	0.048	0.2785	0.5986	0.0001	5.40E-07
178	0.00	0.000	0.013	0.2773	0.5984	0.0001	5.39E-07
179	0.00	0.000	0.002	0.2771	0.5982	0.0001	5.39E-07
180	0.22	0.066	0.034	0.2890	0.5981	0.0001	5.39E-07
181	0.08	0.000	0.032	0.2940	0.5979	0.0001	5.39E-07
182	0.00	0.000	0.016	0.2925	0.5977	0.0001	5.39E-07
183	0.16	0.010	0.039	0.3034	0.5976	0.0001	5.39E-07
184	0.00	0.000	0.065	0.2971	0.5974	0.0001	5.39E-07

185	0.00	0.000	0.023	0.2952	0.5972	0.0001	5.38E-07
186	0.65	0.453	0.042	0.3109	0.5970	0.0001	5.38E-07
187	0.00	0.000	0.099	0.3009	0.5969	0.0001	5.38E-07
188	0.00	0.000	0.167	0.2842	0.5967	0.0001	5.38E-07
189	0.00	0.000	0.060	0.2782	0.5965	0.0001	5.38E-07
190	0.00	0.000	0.009	0.2773	0.5963	0.0001	5.38E-07
191	0.00	0.000	0.002	0.2771	0.5962	0.0001	5.38E-07
192	0.00	0.000	0.001	0.2770	0.5960	0.0001	5.37E-07
193	0.00	0.000	0.000	0.2770	0.5958	0.0001	5.37E-07
194	0.00	0.000	0.000	0.2770	0.5956	0.0001	5.37E-07
195	0.00	0.000	0.000	0.2770	0.5955	0.0001	5.37E-07
196	0.00	0.000	0.000	0.2770	0.5953	0.0001	5.37E-07
197	0.00	0.000	0.000	0.2770	0.5951	0.0001	5.37E-07
198	0.07	0.000	0.019	0.2820	0.5949	0.0001	5.37E-07
199	0.00	0.000	0.013	0.2806	0.5948	0.0001	5.36E-07
200	0.00	0.000	0.017	0.2789	0.5946	0.0001	5.36E-07
201	0.00	0.000	0.006	0.2783	0.5944	0.0001	5.36E-07
202	0.32	0.143	0.037	0.2923	0.5942	0.0001	5.36E-07
203	0.50	0.354	0.036	0.3037	0.5941	0.0001	5.36E-07
204	0.08	0.000	0.107	0.3008	0.5939	0.0001	5.36E-07
205	0.00	0.000	0.019	0.2989	0.5937	0.0001	5.36E-07
206	0.00	0.000	0.017	0.2972	0.5935	0.0001	5.35E-07
207	0.06	0.000	0.030	0.2999	0.5934	0.0001	5.35E-07
208	0.02	0.000	0.028	0.2991	0.5932	0.0001	5.35E-07
209	0.00	0.000	0.021	0.2970	0.5930	0.0001	5.35E-07
210	0.00	0.000	0.020	0.2950	0.5929	0.0001	5.35E-07
211	0.04	0.000	0.027	0.2958	0.5927	0.0001	5.35E-07
212	0.65	0.492	0.034	0.3082	0.5925	0.0001	5.35E-07
213	0.00	0.000	0.143	0.2938	0.5923	0.0001	5.34E-07
214	0.21	0.053	0.097	0.3001	0.5922	0.0001	5.34E-07
215	0.00	0.000	0.147	0.2855	0.5920	0.0001	5.34E-07
216	0.00	0.000	0.050	0.2805	0.5918	0.0001	5.34E-07

217	0.02	0.000	0.042	0.2782	0.5916	0.0001	5.34E-07
218	0.00	0.000	0.008	0.2773	0.5915	0.0001	5.34E-07
219	0.00	0.000	0.003	0.2771	0.5913	0.0001	5.34E-07
220	0.00	0.000	0.001	0.2770	0.5911	0.0001	5.33E-07
221	0.00	0.000	0.000	0.2770	0.5910	0.0001	5.33E-07
222	0.00	0.000	0.000	0.2770	0.5908	0.0001	5.33E-07
223	0.07	0.000	0.018	0.2825	0.5906	0.0001	5.33E-07
224	0.59	0.413	0.040	0.2961	0.5904	0.0001	5.33E-07
225	0.00	0.000	0.013	0.2948	0.5903	0.0001	5.33E-07
226	0.00	0.000	0.020	0.2928	0.5901	0.0001	5.33E-07
227	0.00	0.000	0.020	0.2907	0.5899	0.0001	5.32E-07
228	0.00	0.000	0.021	0.2886	0.5897	0.0001	5.32E-07
229	0.03	0.000	0.036	0.2881	0.5896	0.0001	5.32E-07
230	0.00	0.000	0.021	0.2860	0.5894	0.0001	5.32E-07
231	0.18	0.033	0.034	0.2976	0.5892	0.0001	5.32E-07
232	0.03	0.000	0.069	0.2936	0.5891	0.0001	5.32E-07
233	0.08	0.000	0.031	0.2990	0.5889	0.0001	5.32E-07
234	0.00	0.000	0.017	0.2973	0.5887	0.0001	5.31E-07
235	0.00	0.000	0.016	0.2958	0.5885	0.0001	5.31E-07
236	0.18	0.028	0.036	0.3075	0.5884	0.0001	5.31E-07
237	0.00	0.000	0.181	0.2895	0.5882	0.0001	5.31E-07
238	0.00	0.000	0.023	0.2872	0.5880	0.0001	5.31E-07
239	0.00	0.000	0.021	0.2851	0.5878	0.0001	5.31E-07
240	0.00	0.000	0.019	0.2832	0.5878	0.0001	5.31E-07
241	0.00	0.000	0.022	0.2809	0.5876	0.0001	5.31E-07
242	0.00	0.000	0.017	0.2792	0.5875	0.0001	5.30E-07
243	0.04	0.000	0.030	0.2797	0.5873	0.0001	5.30E-07
244	0.88	0.712	0.033	0.2937	0.5871	0.0001	5.30E-07
245	0.00	0.000	0.037	0.2900	0.5870	0.0001	5.30E-07
246	0.00	0.000	0.054	0.2847	0.5868	0.0001	5.30E-07
247	0.00	0.000	0.058	0.2789	0.5866	0.0001	5.30E-07
248	0.00	0.000	0.016	0.2773	0.5864	0.0001	5.30E-07

249	0.00	0.000	0.002	0.2771	0.5863	0.0001	5.29E-07
250	0.00	0.000	0.001	0.2770	0.5861	0.0001	5.29E-07
251	0.00	0.000	0.000	0.2770	0.5859	0.0001	5.29E-07
252	0.00	0.000	0.000	0.2770	0.5858	0.0001	5.29E-07
253	0.00	0.000	0.000	0.2770	0.5856	0.0001	5.29E-07
254	0.28	0.124	0.037	0.2892	0.5854	0.0001	5.29E-07
255	0.00	0.000	0.013	0.2879	0.5852	0.0001	5.29E-07
256	0.00	0.000	0.019	0.2860	0.5851	0.0001	5.28E-07
257	0.00	0.000	0.016	0.2844	0.5849	0.0001	5.28E-07
258	0.00	0.000	0.015	0.2830	0.5847	0.0001	5.28E-07
259	0.00	0.000	0.016	0.2814	0.5846	0.0001	5.28E-07
260	0.00	0.000	0.014	0.2800	0.5844	0.0001	5.28E-07
261	0.00	0.000	0.014	0.2785	0.5842	0.0001	5.28E-07
262	0.00	0.000	0.009	0.2776	0.5841	0.0001	5.28E-07
263	0.00	0.000	0.005	0.2772	0.5839	0.0001	5.27E-07
264	0.00	0.000	0.001	0.2770	0.5837	0.0001	5.27E-07
265	0.00	0.000	0.000	0.2770	0.5835	0.0001	5.27E-07
266	0.01	0.000	0.005	0.2770	0.5834	0.0001	5.27E-07
267	0.15	0.000	0.023	0.2898	0.5832	0.0001	5.27E-07
268	0.00	0.000	0.007	0.2891	0.5830	0.0001	5.27E-07
269	0.00	0.000	0.010	0.2880	0.5829	0.0001	5.27E-07
270	0.04	0.000	0.025	0.2894	0.5827	0.0001	5.26E-07
271	0.00	0.000	0.013	0.2883	0.5825	0.0001	5.26E-07
272	0.00	0.000	0.008	0.2876	0.5823	0.0001	5.26E-07
273	0.02	0.000	0.021	0.2878	0.5822	0.0001	5.26E-07
274	0.00	0.000	0.009	0.2870	0.5820	0.0001	5.26E-07
275	0.00	0.000	0.008	0.2862	0.5818	0.0001	5.26E-07
276	0.00	0.000	0.009	0.2853	0.5817	0.0001	5.26E-07
277	0.00	0.000	0.009	0.2845	0.5815	0.0001	5.25E-07
278	0.00	0.000	0.008	0.2836	0.5813	0.0001	5.25E-07
279	0.00	0.000	0.008	0.2828	0.5812	0.0001	5.25E-07
280	0.00	0.000	0.008	0.2819	0.5810	0.0001	5.25E-07

281	0.00	0.000	0.009	0.2811	0.5808	0.0001	5.25E-07
282	0.00	0.000	0.008	0.2803	0.5807	0.0001	5.25E-07
283	0.00	0.000	0.008	0.2795	0.5805	0.0001	5.25E-07
284	0.00	0.000	0.008	0.2787	0.5803	0.0001	5.24E-07
285	0.00	0.000	0.008	0.2779	0.5801	0.0001	5.24E-07
286	0.00	0.000	0.006	0.2773	0.5800	0.0001	5.24E-07
287	0.00	0.000	0.003	0.2770	0.5798	0.0001	5.24E-07
288	0.00	0.000	0.000	0.2770	0.5796	0.0001	5.24E-07
289	0.37	0.201	0.027	0.2912	0.5795	0.0001	5.24E-07
290	0.05	0.000	0.021	0.2944	0.5793	0.0001	5.24E-07
291	0.00	0.000	0.006	0.2939	0.5791	0.0001	5.23E-07
292	0.00	0.000	0.007	0.2931	0.5790	0.0001	5.23E-07
293	0.00	0.000	0.007	0.2925	0.5788	0.0001	5.23E-07
294	0.00	0.000	0.007	0.2918	0.5786	0.0001	5.23E-07
295	0.00	0.000	0.006	0.2912	0.5785	0.0001	5.23E-07
296	0.00	0.000	0.006	0.2906	0.5783	0.0001	5.23E-07
297	0.00	0.000	0.006	0.2899	0.5781	0.0001	5.23E-07
298	0.00	0.000	0.006	0.2893	0.5779	0.0001	5.22E-07
299	0.00	0.000	0.006	0.2887	0.5778	0.0001	5.22E-07
300	0.00	0.000	0.006	0.2881	0.5776	0.0001	5.22E-07
301	0.50	0.325	0.026	0.3028	0.5774	0.0001	5.22E-07
302	0.63	0.490	0.026	0.3144	0.5773	0.0001	5.22E-07
303	0.00	0.000	0.064	0.3080	0.5771	0.0001	5.22E-07
304	0.00	0.000	0.068	0.3013	0.5769	0.0001	5.22E-07
305	0.00	0.000	0.071	0.2941	0.5768	0.0001	5.22E-07
306	0.00	0.000	0.075	0.2867	0.5766	0.0001	5.21E-07
307	0.00	0.000	0.082	0.2785	0.5764	0.0001	5.21E-07
308	0.00	0.000	0.012	0.2773	0.5763	0.0001	5.21E-07
309	0.50	0.288	0.058	0.2924	0.5761	0.0001	5.21E-07
310	0.00	0.000	0.049	0.2879	0.5759	0.0001	5.21E-07
311	0.00	0.000	0.044	0.2835	0.5757	0.0001	5.21E-07
312	0.00	0.000	0.058	0.2777	0.5756	0.0001	5.21E-07

313		0.00	0.000	0.005	0.2772	0.5754	0.0001	5.20E-07
314		0.00	0.000	0.001	0.2770	0.5752	0.0001	5.20E-07
315		0.81	0.592	0.052	0.2933	0.5751	0.0001	5.20E-07
316		0.37	0.191	0.067	0.3050	0.5749	0.0001	5.20E-07
317		0.00	0.000	0.034	0.3016	0.5747	0.0001	5.20E-07
318		0.00	0.000	0.051	0.2965	0.5746	0.0001	5.20E-07
319		0.00	0.000	0.057	0.2908	0.5744	0.0001	5.20E-07
320		0.00	0.000	0.063	0.2845	0.5742	0.0001	5.19E-07
321		0.00	0.000	0.059	0.2787	0.5741	0.0001	5.19E-07
322		0.00	0.000	0.014	0.2773	0.5739	0.0001	5.19E-07
323		0.00	0.000	0.002	0.2771	0.5737	0.0001	5.19E-07
324		0.02	0.000	0.016	0.2777	0.5736	0.0001	5.19E-07
325		0.05	0.000	0.018	0.2811	0.5734	0.0001	5.19E-07
326		0.00	0.000	0.005	0.2806	0.5732	0.0001	5.19E-07
327		0.00	0.000	0.012	0.2795	0.5731	0.0001	5.18E-07
328		0.00	0.000	0.007	0.2788	0.5729	0.0001	5.18E-07
329		0.00	0.000	0.006	0.2782	0.5727	0.0001	5.18E-07
330		0.00	0.000	0.004	0.2778	0.5726	0.0001	5.18E-07
331		0.02	0.000	0.016	0.2787	0.5724	0.0001	5.18E-07
332		0.00	0.000	0.002	0.2785	0.5722	0.0001	5.18E-07
333		0.00	0.000	0.004	0.2781	0.5721	0.0001	5.18E-07
334		0.00	0.000	0.003	0.2778	0.5719	0.0001	5.17E-07
335		0.00	0.000	0.003	0.2775	0.5717	0.0001	5.17E-07
336		0.05	0.000	0.019	0.2810	0.5716	0.0001	5.17E-07
337		0.00	0.000	0.002	0.2809	0.5714	0.0001	5.17E-07
338		0.32	0.155	0.032	0.2946	0.5712	0.0001	5.17E-07
339		0.00	0.000	0.007	0.2940	0.5711	0.0001	5.17E-07
340		0.00	0.000	0.010	0.2930	0.5709	0.0001	5.17E-07
341		0.00	0.000	0.010	0.2920	0.5707	0.0001	5.17E-07
342		0.00	0.000	0.010	0.2910	0.5706	0.0001	5.16E-07
343	*	0.00	0.000	0.000	0.2910	0.5704	0.0001	5.16E-07
344		0.00	0.000	0.009	0.2901	0.5702	0.0001	5.16E-07

345	*	0.00	0.000	0.009	0.2892	0.5701	0.0001	5.16E-07
346		0.00	0.000	0.009	0.2883	0.5699	0.0001	5.16E-07
347	*	0.00	0.000	0.009	0.2874	0.5697	0.0001	5.16E-07
348		0.00	0.000	0.009	0.2865	0.5696	0.0001	5.16E-07
349		0.00	0.000	0.009	0.2857	0.5694	0.0001	5.15E-07
350		0.00	0.000	0.008	0.2849	0.5692	0.0001	5.15E-07
351		0.00	0.000	0.008	0.2840	0.5691	0.0001	5.15E-07
352		0.00	0.000	0.008	0.2832	0.5689	0.0001	5.15E-07
353		0.00	0.000	0.008	0.2824	0.5687	0.0001	5.15E-07
354		0.00	0.000	0.009	0.2817	0.5686	0.0001	5.15E-07
355	*	0.31	0.000	0.031	0.2836	0.5684	0.0001	5.15E-07
356		0.16	0.084	0.000	0.2976	0.5682	0.0001	5.14E-07
357	*	0.00	0.000	0.028	0.2996	0.5681	0.0001	5.14E-07
358		0.00	0.000	0.061	0.3083	0.5679	0.0001	5.14E-07
359		0.00	0.000	0.008	0.3076	0.5677	0.0001	5.14E-07
360		0.00	0.000	0.008	0.3068	0.5676	0.0001	5.14E-07
361	*	0.09	0.000	0.035	0.3088	0.5674	0.0001	5.14E-07
362	*	0.56	0.000	0.028	0.3107	0.5673	0.0001	5.14E-07
363	*	0.02	0.000	0.000	0.3127	0.5671	0.0001	5.14E-07
364	*	0.00	0.000	0.021	0.3147	0.5669	0.0001	5.13E-07
365	*	0.00	0.000	0.010	0.3167	0.5668	0.0001	5.13E-07

* = Frozen (air or soil)

Annual Totals for Year 12			
	inches	cubic feet	percent
Precipitation	28.20	102,377.7	100.00
Runoff	15.716	57,048.0	55.72
Evapotranspiration	11.991	43,527.5	42.52
Recirculation into Layer 1	0.0248	90.0	0.09
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0248	90.0	0.09
Percolation/Leakage through Layer 5	0.000197	0.7159	0.00
Average Head on Top of Layer 4	0.5978	---	---
Change in Water Storage	0.4963	1,801.5	1.76
Soil Water at Start of Year	1,407.0079	5,107,438.8	4988.82
Soil Water at End of Year	1,407.0650	5,107,646.1	4989.02
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.4392	1,594.2	1.56
Annual Water Budget Balance	-0.0248	-90.1	-0.09

Daily Output for Year 13

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.015	0.3206	0.5664	0.0001	5.13E-07
2	*		0.00	0.000	0.029	0.3226	0.5663	0.0001	5.13E-07
3	*		0.00	0.000	0.029	0.3246	0.5661	0.0001	5.13E-07
4	*		0.00	0.000	0.013	0.3265	0.5659	0.0001	5.13E-07
5	*		0.02	0.000	0.000	0.3285	0.5658	0.0001	5.12E-07
6	*	*	0.19	0.000	0.015	0.3285	0.5656	0.0001	5.12E-07
7	*	*	0.00	0.000	0.022	0.3285	0.5654	0.0001	5.12E-07
8	*	*	0.00	0.000	0.000	0.3285	0.5653	0.0001	5.12E-07
9		*	0.00	0.221	0.027	0.3323	0.5651	0.0001	5.12E-07
10		*	0.00	0.021	0.129	0.3323	0.5649	0.0001	5.12E-07
11			0.00	0.000	0.079	0.3245	0.5648	0.0001	5.12E-07
12			0.09	0.000	0.061	0.3278	0.5648	0.0001	5.12E-07
13			0.21	0.061	0.066	0.3363	0.5646	0.0001	5.11E-07
14	*		0.00	0.000	0.034	0.3333	0.5644	0.0001	5.11E-07
15	*	*	0.81	0.000	0.040	0.3333	0.5643	0.0001	5.11E-07
16		*	0.00	0.420	0.000	0.3349	0.5641	0.0001	5.11E-07
17	*	*	0.09	0.000	0.024	0.3349	0.5639	0.0001	5.11E-07
18	*	*	0.00	0.000	0.009	0.3349	0.5638	0.0001	5.11E-07
19	*	*	0.00	0.000	0.005	0.3349	0.5636	0.0001	5.11E-07
20	*	*	0.00	0.000	0.003	0.3349	0.5634	0.0001	5.10E-07
21	*	*	0.00	0.000	0.003	0.3350	0.5633	0.0001	5.10E-07
22	*	*	0.00	0.000	0.008	0.3350	0.5631	0.0001	5.10E-07
23	*	*	0.00	0.000	0.041	0.3350	0.5629	0.0001	5.10E-07
24	*	*	0.27	0.000	0.021	0.3350	0.5628	0.0001	5.10E-07

25	*	*	0.17	0.000	0.000	0.3350	0.5626	0.0001	5.10E-07
26	*	*	0.00	0.000	0.037	0.3350	0.5624	0.0001	5.10E-07
27	*	*	0.00	0.000	0.015	0.3350	0.5623	0.0001	5.10E-07
28	*	*	0.00	0.000	0.028	0.3350	0.5621	0.0001	5.09E-07
29		*	0.19	0.158	0.000	0.3350	0.5620	0.0001	5.09E-07
30	*	*	0.00	0.000	0.039	0.3350	0.5618	0.0001	5.09E-07
31		*	0.00	0.649	0.000	0.3350	0.5616	0.0001	5.09E-07
32		*	0.08	0.003	0.016	0.3413	0.5615	0.0001	5.09E-07
33			0.05	0.000	0.082	0.3382	0.5613	0.0001	5.09E-07
34			0.00	0.000	0.070	0.3313	0.5611	0.0001	5.09E-07
35			0.00	0.000	0.085	0.3228	0.5610	0.0001	5.08E-07
36	*		0.03	0.000	0.066	0.3191	0.5608	0.0001	5.08E-07
37			0.00	0.000	0.060	0.3132	0.5607	0.0001	5.08E-07
38			0.00	0.000	0.118	0.3014	0.5605	0.0001	5.08E-07
39			0.00	0.000	0.060	0.2953	0.5604	0.0001	5.08E-07
40			0.00	0.000	0.037	0.2916	0.5602	0.0001	5.08E-07
41			0.00	0.000	0.068	0.2848	0.5600	0.0001	5.08E-07
42			0.00	0.000	0.049	0.2799	0.5599	0.0001	5.08E-07
43			0.00	0.000	0.024	0.2775	0.5597	0.0001	5.07E-07
44			0.00	0.000	0.005	0.2770	0.5595	0.0001	5.07E-07
45			0.00	0.000	0.000	0.2770	0.5594	0.0001	5.07E-07
46			0.00	0.000	0.000	0.2770	0.5592	0.0001	5.07E-07
47			0.00	0.000	0.000	0.2770	0.5590	0.0001	5.07E-07
48			0.00	0.000	0.000	0.2770	0.5589	0.0001	5.07E-07
49			0.00	0.000	0.000	0.2770	0.5587	0.0001	5.07E-07
50			0.00	0.000	0.000	0.2770	0.5586	0.0001	5.06E-07
51			0.00	0.000	0.000	0.2770	0.5584	0.0001	5.06E-07
52			0.00	0.000	0.000	0.2770	0.5582	0.0001	5.06E-07
53			0.00	0.000	0.000	0.2770	0.5581	0.0001	5.06E-07
54	*		0.00	0.000	0.000	0.2770	0.5579	0.0001	5.06E-07
55			0.00	0.000	0.000	0.2770	0.5577	0.0001	5.06E-07
56			0.00	0.000	0.000	0.2770	0.5576	0.0001	5.06E-07

57		0.00	0.000	0.000	0.2770	0.5574	0.0001	5.05E-07
58		0.03	0.000	0.015	0.2786	0.5573	0.0001	5.05E-07
59		0.00	0.000	0.001	0.2785	0.5571	0.0001	5.05E-07
60		0.00	0.000	0.003	0.2782	0.5569	0.0001	5.05E-07
61		0.00	0.000	0.003	0.2779	0.5568	0.0001	5.05E-07
62		0.00	0.000	0.003	0.2777	0.5566	0.0001	5.05E-07
63		0.00	0.000	0.002	0.2775	0.5564	0.0001	5.05E-07
64		0.00	0.000	0.002	0.2772	0.5563	0.0001	5.05E-07
65		0.00	0.000	0.002	0.2770	0.5561	0.0001	5.04E-07
66		0.00	0.000	0.000	0.2770	0.5560	0.0001	5.04E-07
67		0.00	0.000	0.000	0.2770	0.5558	0.0001	5.04E-07
68		0.00	0.000	0.000	0.2770	0.5556	0.0001	5.04E-07
69		0.00	0.000	0.000	0.2770	0.5555	0.0001	5.04E-07
70		0.00	0.000	0.000	0.2770	0.5553	0.0001	5.04E-07
71	*	0.00	0.000	0.000	0.2770	0.5551	0.0001	5.04E-07
72	*	0.24	0.000	0.024	0.2790	0.5550	0.0001	5.03E-07
73	*	0.00	0.000	0.082	0.2810	0.5548	0.0001	5.03E-07
74	*	0.48	0.000	0.020	0.2829	0.5547	0.0001	5.03E-07
75	*	0.00	0.000	0.014	0.2849	0.5545	0.0001	5.03E-07
76	*	0.00	0.000	0.012	0.2869	0.5543	0.0001	5.03E-07
77	*	0.00	0.000	0.018	0.2888	0.5542	0.0001	5.03E-07
78		0.00	0.212	0.089	0.3016	0.5540	0.0001	5.03E-07
79	*	0.40	0.000	0.036	0.3036	0.5538	0.0001	5.03E-07
80	*	0.04	0.000	0.018	0.3055	0.5537	0.0001	5.02E-07
81		0.04	0.160	0.102	0.3183	0.5535	0.0001	5.02E-07
82		0.00	0.000	0.008	0.3175	0.5534	0.0001	5.02E-07
83		0.00	0.000	0.008	0.3167	0.5532	0.0001	5.02E-07
84		1.09	0.927	0.027	0.3299	0.5530	0.0001	5.02E-07
85		0.00	0.000	0.057	0.3242	0.5529	0.0001	5.02E-07
86		0.00	0.000	0.134	0.3108	0.5527	0.0001	5.02E-07
87		0.00	0.000	0.079	0.3029	0.5525	0.0001	5.01E-07
88		0.00	0.000	0.116	0.2913	0.5524	0.0001	5.01E-07

89		0.00	0.000	0.119	0.2794	0.5522	0.0001	5.01E-07
90		0.00	0.000	0.022	0.2772	0.5521	0.0001	5.01E-07
91		0.00	0.000	0.002	0.2770	0.5519	0.0001	5.01E-07
92		0.00	0.000	0.000	0.2770	0.5517	0.0001	5.01E-07
93		0.00	0.000	0.000	0.2770	0.5516	0.0001	5.01E-07
94		0.00	0.000	0.000	0.2770	0.5514	0.0001	5.01E-07
95		0.02	0.000	0.012	0.2774	0.5513	0.0001	5.00E-07
96	*	0.00	0.000	0.000	0.2774	0.5511	0.0001	5.00E-07
97		0.00	0.000	0.002	0.2772	0.5509	0.0001	5.00E-07
98	*	0.00	0.000	0.001	0.2770	0.5508	0.0001	5.00E-07
99		0.00	0.000	0.000	0.2770	0.5506	0.0001	5.00E-07
100		0.00	0.000	0.000	0.2770	0.5505	0.0001	5.00E-07
101		0.03	0.000	0.016	0.2789	0.5503	0.0001	5.00E-07
102		0.21	0.057	0.024	0.2918	0.5501	0.0001	4.99E-07
103		0.03	0.000	0.020	0.2923	0.5500	0.0001	4.99E-07
104		0.00	0.000	0.012	0.2912	0.5498	0.0001	4.99E-07
105		0.00	0.000	0.012	0.2900	0.5497	0.0001	4.99E-07
106		0.45	0.281	0.033	0.3041	0.5495	0.0001	4.99E-07
107		0.00	0.000	0.011	0.3030	0.5493	0.0001	4.99E-07
108		0.02	0.000	0.021	0.3026	0.5492	0.0001	4.99E-07
109		0.00	0.000	0.010	0.3016	0.5490	0.0001	4.99E-07
110		0.00	0.000	0.010	0.3006	0.5489	0.0001	4.98E-07
111		0.10	0.000	0.026	0.3081	0.5487	0.0001	4.98E-07
112		0.00	0.000	0.012	0.3070	0.5485	0.0001	4.98E-07
113		0.00	0.000	0.011	0.3059	0.5484	0.0001	4.98E-07
114		0.00	0.000	0.010	0.3049	0.5482	0.0001	4.98E-07
115		0.00	0.000	0.009	0.3040	0.5480	0.0001	4.98E-07
116		0.00	0.000	0.009	0.3031	0.5479	0.0001	4.98E-07
117		0.01	0.000	0.018	0.3026	0.5477	0.0001	4.97E-07
118		0.21	0.057	0.028	0.3153	0.5476	0.0001	4.97E-07
119		1.04	0.753	0.167	0.3268	0.5474	0.0001	4.97E-07
120		0.00	0.000	0.220	0.3048	0.5472	0.0001	4.97E-07

121	0.00	0.000	0.108	0.2940	0.5471	0.0001	4.97E-07
122	0.00	0.000	0.050	0.2890	0.5469	0.0001	4.97E-07
123	0.00	0.000	0.039	0.2851	0.5468	0.0001	4.97E-07
124	0.00	0.000	0.033	0.2817	0.5466	0.0001	4.97E-07
125	0.00	0.000	0.029	0.2788	0.5464	0.0001	4.96E-07
126	0.17	0.021	0.043	0.2898	0.5463	0.0001	4.96E-07
127	0.01	0.000	0.024	0.2888	0.5461	0.0001	4.96E-07
128	0.00	0.000	0.017	0.2870	0.5460	0.0001	4.96E-07
129	0.00	0.000	0.016	0.2855	0.5458	0.0001	4.96E-07
130	0.02	0.000	0.025	0.2845	0.5456	0.0001	4.96E-07
131	2.07	1.883	0.038	0.2990	0.5455	0.0001	4.96E-07
132	0.48	0.205	0.238	0.3030	0.5453	0.0001	4.95E-07
133	0.00	0.000	0.053	0.2980	0.5452	0.0001	4.95E-07
134	0.19	0.040	0.075	0.3051	0.5450	0.0001	4.95E-07
135	0.42	0.184	0.227	0.3062	0.5449	0.0001	4.95E-07
136	0.00	0.000	0.173	0.2888	0.5447	0.0001	4.95E-07
137	0.00	0.000	0.079	0.2810	0.5445	0.0001	4.95E-07
138	0.04	0.000	0.062	0.2787	0.5444	0.0001	4.95E-07
139	0.00	0.000	0.011	0.2775	0.5442	0.0001	4.95E-07
140	0.00	0.000	0.004	0.2772	0.5441	0.0001	4.94E-07
141	0.00	0.000	0.001	0.2770	0.5439	0.0001	4.94E-07
142	0.01	0.000	0.012	0.2771	0.5437	0.0001	4.94E-07
143	0.01	0.000	0.007	0.2770	0.5436	0.0001	4.94E-07
144	0.25	0.101	0.029	0.2895	0.5434	0.0001	4.94E-07
145	0.08	0.000	0.028	0.2942	0.5433	0.0001	4.94E-07
146	0.00	0.000	0.012	0.2930	0.5431	0.0001	4.94E-07
147	0.00	0.000	0.018	0.2912	0.5429	0.0001	4.93E-07
148	0.00	0.000	0.017	0.2895	0.5428	0.0001	4.93E-07
149	0.00	0.000	0.016	0.2880	0.5426	0.0001	4.93E-07
150	0.31	0.127	0.037	0.3025	0.5425	0.0001	4.93E-07
151	0.01	0.000	0.024	0.3014	0.5423	0.0001	4.93E-07
152	1.45	1.275	0.037	0.3155	0.5422	0.0001	4.93E-07

153	0.16	0.020	0.077	0.3218	0.5420	0.0001	4.93E-07
154	0.00	0.000	0.130	0.3089	0.5418	0.0001	4.93E-07
155	0.00	0.000	0.139	0.2951	0.5417	0.0001	4.92E-07
156	0.00	0.000	0.163	0.2788	0.5415	0.0001	4.92E-07
157	0.52	0.265	0.112	0.2928	0.5414	0.0001	4.92E-07
158	0.00	0.000	0.068	0.2860	0.5412	0.0001	4.92E-07
159	0.00	0.000	0.069	0.2791	0.5410	0.0001	4.92E-07
160	0.00	0.000	0.018	0.2773	0.5409	0.0001	4.92E-07
161	0.00	0.000	0.002	0.2771	0.5407	0.0001	4.92E-07
162	0.00	0.000	0.001	0.2770	0.5406	0.0001	4.92E-07
163	0.12	0.000	0.021	0.2866	0.5404	0.0001	4.91E-07
164	0.33	0.145	0.049	0.2998	0.5403	0.0001	4.91E-07
165	0.00	0.000	0.014	0.2984	0.5401	0.0001	4.91E-07
166	0.01	0.000	0.027	0.2968	0.5399	0.0001	4.91E-07
167	0.00	0.000	0.021	0.2947	0.5398	0.0001	4.91E-07
168	0.00	0.000	0.021	0.2927	0.5396	0.0001	4.91E-07
169	0.00	0.000	0.021	0.2906	0.5395	0.0001	4.91E-07
170	0.25	0.088	0.037	0.3029	0.5393	0.0001	4.90E-07
171	0.00	0.000	0.168	0.2862	0.5392	0.0001	4.90E-07
172	0.00	0.000	0.018	0.2844	0.5390	0.0001	4.90E-07
173	0.00	0.000	0.019	0.2825	0.5388	0.0001	4.90E-07
174	0.00	0.000	0.019	0.2806	0.5387	0.0001	4.90E-07
175	0.00	0.000	0.024	0.2782	0.5385	0.0001	4.90E-07
176	0.00	0.000	0.010	0.2772	0.5384	0.0001	4.90E-07
177	0.17	0.015	0.029	0.2896	0.5382	0.0001	4.90E-07
178	0.00	0.000	0.010	0.2886	0.5381	0.0001	4.89E-07
179	0.77	0.594	0.036	0.3028	0.5379	0.0001	4.89E-07
180	0.27	0.110	0.087	0.3099	0.5377	0.0001	4.89E-07
181	0.16	0.020	0.089	0.3153	0.5376	0.0001	4.89E-07
182	0.57	0.314	0.185	0.3223	0.5374	0.0001	4.89E-07
183	0.00	0.000	0.074	0.3149	0.5373	0.0001	4.89E-07
184	0.00	0.000	0.089	0.3060	0.5371	0.0001	4.89E-07

185	0.00	0.000	0.237	0.2823	0.5370	0.0001	4.88E-07
186	0.00	0.000	0.046	0.2777	0.5368	0.0001	4.88E-07
187	0.00	0.000	0.005	0.2772	0.5366	0.0001	4.88E-07
188	0.65	0.424	0.064	0.2930	0.5365	0.0001	4.88E-07
189	0.19	0.051	0.063	0.3010	0.5363	0.0001	4.88E-07
190	0.01	0.000	0.113	0.2911	0.5362	0.0001	4.88E-07
191	0.18	0.016	0.094	0.2978	0.5360	0.0001	4.88E-07
192	0.00	0.000	0.152	0.2826	0.5359	0.0001	4.88E-07
193	0.00	0.000	0.037	0.2789	0.5357	0.0001	4.87E-07
194	0.00	0.000	0.014	0.2775	0.5355	0.0001	4.87E-07
195	0.00	0.000	0.004	0.2771	0.5354	0.0001	4.87E-07
196	0.00	0.000	0.001	0.2770	0.5352	0.0001	4.87E-07
197	0.12	0.000	0.021	0.2866	0.5351	0.0001	4.87E-07
198	0.00	0.000	0.014	0.2852	0.5349	0.0001	4.87E-07
199	0.00	0.000	0.018	0.2834	0.5348	0.0001	4.87E-07
200	0.35	0.163	0.050	0.2972	0.5346	0.0001	4.87E-07
201	0.37	0.216	0.048	0.3081	0.5344	0.0001	4.86E-07
202	0.00	0.000	0.156	0.2925	0.5343	0.0001	4.86E-07
203	0.00	0.000	0.026	0.2898	0.5341	0.0001	4.86E-07
204	0.00	0.000	0.027	0.2871	0.5340	0.0001	4.86E-07
205	0.00	0.000	0.022	0.2850	0.5338	0.0001	4.86E-07
206	0.00	0.000	0.018	0.2832	0.5337	0.0001	4.86E-07
207	0.00	0.000	0.025	0.2807	0.5335	0.0001	4.86E-07
208	0.25	0.097	0.039	0.2922	0.5334	0.0001	4.86E-07
209	0.18	0.046	0.044	0.3014	0.5332	0.0001	4.85E-07
210	0.00	0.000	0.129	0.2885	0.5330	0.0001	4.85E-07
211	0.00	0.000	0.020	0.2865	0.5329	0.0001	4.85E-07
212	0.00	0.000	0.017	0.2849	0.5327	0.0001	4.85E-07
213	0.00	0.000	0.022	0.2826	0.5326	0.0001	4.85E-07
214	0.00	0.000	0.019	0.2808	0.5324	0.0001	4.85E-07
215	0.00	0.000	0.021	0.2787	0.5323	0.0001	4.85E-07
216	0.00	0.000	0.014	0.2773	0.5321	0.0001	4.84E-07

217	0.00	0.000	0.003	0.2771	0.5319	0.0001	4.84E-07
218	0.00	0.000	0.001	0.2770	0.5318	0.0001	4.84E-07
219	0.00	0.000	0.000	0.2770	0.5316	0.0001	4.84E-07
220	0.00	0.000	0.000	0.2770	0.5315	0.0001	4.84E-07
221	0.03	0.000	0.016	0.2779	0.5313	0.0001	4.84E-07
222	0.07	0.000	0.019	0.2829	0.5312	0.0001	4.84E-07
223	0.00	0.000	0.009	0.2820	0.5310	0.0001	4.84E-07
224	0.00	0.000	0.013	0.2807	0.5309	0.0001	4.83E-07
225	0.00	0.000	0.013	0.2794	0.5307	0.0001	4.83E-07
226	0.00	0.000	0.009	0.2785	0.5306	0.0001	4.83E-07
227	0.00	0.000	0.004	0.2781	0.5304	0.0001	4.83E-07
228	0.00	0.000	0.005	0.2776	0.5302	0.0001	4.83E-07
229	0.00	0.000	0.005	0.2771	0.5301	0.0001	4.83E-07
230	0.00	0.000	0.001	0.2770	0.5299	0.0001	4.83E-07
231	0.12	0.000	0.021	0.2872	0.5298	0.0001	4.83E-07
232	0.17	0.021	0.026	0.2997	0.5296	0.0001	4.82E-07
233	0.00	0.000	0.008	0.2990	0.5295	0.0001	4.82E-07
234	0.00	0.000	0.012	0.2978	0.5293	0.0001	4.82E-07
235	0.04	0.000	0.030	0.2991	0.5292	0.0001	4.82E-07
236	1.44	1.282	0.034	0.3113	0.5290	0.0001	4.82E-07
237	0.00	0.000	0.162	0.2953	0.5289	0.0001	4.82E-07
238	0.07	0.000	0.145	0.2880	0.5287	0.0001	4.82E-07
239	0.00	0.000	0.071	0.2809	0.5285	0.0001	4.82E-07
240	0.00	0.000	0.029	0.2780	0.5284	0.0001	4.81E-07
241	0.00	0.000	0.008	0.2772	0.5282	0.0001	4.81E-07
242	0.00	0.000	0.002	0.2770	0.5281	0.0001	4.81E-07
243	0.10	0.000	0.023	0.2844	0.5279	0.0001	4.81E-07
244	0.00	0.000	0.020	0.2824	0.5278	0.0001	4.81E-07
245	0.00	0.000	0.024	0.2800	0.5276	0.0001	4.81E-07
246	1.32	1.129	0.062	0.2934	0.5275	0.0001	4.81E-07
247	0.02	0.000	0.060	0.2890	0.5273	0.0001	4.80E-07
248	0.00	0.000	0.079	0.2811	0.5272	0.0001	4.80E-07

249	0.00	0.000	0.033	0.2778	0.5270	0.0001	4.80E-07
250	0.00	0.000	0.006	0.2772	0.5269	0.0001	4.80E-07
251	0.00	0.000	0.001	0.2771	0.5267	0.0001	4.80E-07
252	0.00	0.000	0.000	0.2770	0.5265	0.0001	4.80E-07
253	0.00	0.000	0.000	0.2770	0.5264	0.0001	4.80E-07
254	0.01	0.000	0.008	0.2770	0.5262	0.0001	4.80E-07
255	0.05	0.000	0.021	0.2801	0.5261	0.0001	4.79E-07
256	0.00	0.000	0.003	0.2798	0.5259	0.0001	4.79E-07
257	0.00	0.000	0.009	0.2789	0.5258	0.0001	4.79E-07
258	0.33	0.145	0.050	0.2928	0.5256	0.0001	4.79E-07
259	0.00	0.000	0.016	0.2913	0.5255	0.0001	4.79E-07
260	0.00	0.000	0.018	0.2895	0.5253	0.0001	4.79E-07
261	0.00	0.000	0.018	0.2877	0.5252	0.0001	4.79E-07
262	0.00	0.000	0.025	0.2852	0.5250	0.0001	4.79E-07
263	0.00	0.000	0.016	0.2836	0.5249	0.0001	4.78E-07
264	0.28	0.114	0.042	0.2959	0.5247	0.0001	4.78E-07
265	0.00	0.000	0.021	0.2938	0.5245	0.0001	4.78E-07
266	0.00	0.000	0.020	0.2919	0.5244	0.0001	4.78E-07
267	0.00	0.000	0.014	0.2904	0.5242	0.0001	4.78E-07
268	0.08	0.000	0.034	0.2945	0.5241	0.0001	4.78E-07
269	0.00	0.000	0.020	0.2925	0.5239	0.0001	4.78E-07
270	0.00	0.000	0.017	0.2908	0.5238	0.0001	4.78E-07
271	0.03	0.000	0.028	0.2914	0.5236	0.0001	4.77E-07
272	1.23	1.066	0.036	0.3039	0.5235	0.0001	4.77E-07
273	0.78	0.562	0.107	0.3152	0.5233	0.0001	4.77E-07
274	0.00	0.000	0.134	0.3018	0.5232	0.0001	4.77E-07
275	0.00	0.000	0.118	0.2900	0.5230	0.0001	4.77E-07
276	0.00	0.000	0.115	0.2785	0.5229	0.0001	4.77E-07
277	0.00	0.000	0.011	0.2774	0.5227	0.0001	4.77E-07
278	0.64	0.345	0.154	0.2913	0.5226	0.0001	4.77E-07
279	0.00	0.000	0.033	0.2879	0.5224	0.0001	4.76E-07
280	0.00	0.000	0.060	0.2819	0.5223	0.0001	4.76E-07

281		0.00	0.000	0.037	0.2782	0.5221	0.0001	4.76E-07
282		0.00	0.000	0.010	0.2773	0.5220	0.0001	4.76E-07
283		0.00	0.000	0.002	0.2771	0.5218	0.0001	4.76E-07
284	*	0.00	0.000	0.001	0.2770	0.5216	0.0001	4.76E-07
285	*	0.05	0.000	0.050	0.2770	0.5215	0.0001	4.76E-07
286		0.02	0.000	0.016	0.2775	0.5213	0.0001	4.75E-07
287	*	0.00	0.000	0.003	0.2773	0.5212	0.0001	4.75E-07
288		0.00	0.000	0.002	0.2771	0.5210	0.0001	4.75E-07
289		0.00	0.000	0.001	0.2770	0.5209	0.0001	4.75E-07
290		0.00	0.000	0.000	0.2770	0.5207	0.0001	4.75E-07
291		0.00	0.000	0.000	0.2770	0.5206	0.0001	4.75E-07
292		0.64	0.433	0.041	0.2933	0.5204	0.0001	4.75E-07
293		0.00	0.000	0.034	0.2898	0.5203	0.0001	4.75E-07
294		0.00	0.000	0.015	0.2883	0.5201	0.0001	4.74E-07
295		0.00	0.000	0.015	0.2869	0.5200	0.0001	4.74E-07
296		0.00	0.000	0.013	0.2855	0.5198	0.0001	4.74E-07
297		0.00	0.000	0.013	0.2842	0.5197	0.0001	4.74E-07
298		0.13	0.000	0.031	0.2936	0.5195	0.0001	4.74E-07
299		0.00	0.000	0.017	0.2921	0.5194	0.0001	4.74E-07
300		0.00	0.000	0.014	0.2907	0.5192	0.0001	4.74E-07
301		0.00	0.000	0.013	0.2894	0.5191	0.0001	4.74E-07
302		0.00	0.000	0.011	0.2883	0.5189	0.0001	4.73E-07
303		0.00	0.000	0.011	0.2872	0.5188	0.0001	4.73E-07
304		0.00	0.000	0.011	0.2861	0.5186	0.0001	4.73E-07
305		0.74	0.557	0.034	0.3011	0.5185	0.0001	4.73E-07
306		0.00	0.000	0.057	0.2954	0.5183	0.0001	4.73E-07
307		0.02	0.000	0.051	0.2922	0.5181	0.0001	4.73E-07
308		0.00	0.000	0.060	0.2863	0.5180	0.0001	4.73E-07
309		0.00	0.000	0.072	0.2790	0.5178	0.0001	4.73E-07
310		0.00	0.000	0.019	0.2773	0.5177	0.0001	4.72E-07
311		0.01	0.000	0.014	0.2771	0.5175	0.0001	4.72E-07
312		0.00	0.000	0.001	0.2770	0.5174	0.0001	4.72E-07

313		0.00	0.000	0.000	0.2770	0.5172	0.0001	4.72E-07
314		0.03	0.000	0.018	0.2783	0.5171	0.0001	4.72E-07
315		0.02	0.000	0.015	0.2788	0.5169	0.0001	4.72E-07
316		0.00	0.000	0.002	0.2786	0.5168	0.0001	4.72E-07
317		0.00	0.000	0.004	0.2782	0.5166	0.0001	4.72E-07
318	*	0.00	0.000	0.000	0.2782	0.5165	0.0001	4.71E-07
319		0.00	0.000	0.004	0.2778	0.5163	0.0001	4.71E-07
320		0.00	0.000	0.004	0.2774	0.5162	0.0001	4.71E-07
321		0.00	0.000	0.003	0.2771	0.5160	0.0001	4.71E-07
322		0.24	0.082	0.027	0.2898	0.5159	0.0001	4.71E-07
323		0.48	0.322	0.037	0.3014	0.5157	0.0001	4.71E-07
324		0.00	0.000	0.027	0.2987	0.5156	0.0001	4.71E-07
325		0.00	0.000	0.060	0.2928	0.5154	0.0001	4.71E-07
326		0.00	0.000	0.036	0.2892	0.5153	0.0001	4.70E-07
327		0.00	0.000	0.036	0.2855	0.5151	0.0001	4.70E-07
328		0.00	0.000	0.028	0.2828	0.5150	0.0001	4.70E-07
329		0.00	0.000	0.023	0.2805	0.5148	0.0001	4.70E-07
330		0.00	0.000	0.025	0.2780	0.5147	0.0001	4.70E-07
331		0.01	0.000	0.020	0.2774	0.5145	0.0001	4.70E-07
332		0.07	0.000	0.021	0.2820	0.5144	0.0001	4.70E-07
333		0.04	0.000	0.027	0.2833	0.5142	0.0001	4.70E-07
334		0.00	0.000	0.012	0.2821	0.5141	0.0001	4.69E-07
335		0.00	0.000	0.010	0.2811	0.5139	0.0001	4.69E-07
336		0.00	0.000	0.013	0.2799	0.5138	0.0001	4.69E-07
337		0.00	0.000	0.012	0.2786	0.5136	0.0001	4.69E-07
338		0.28	0.107	0.037	0.2922	0.5135	0.0001	4.69E-07
339		0.08	0.000	0.029	0.2976	0.5133	0.0001	4.69E-07
340		0.00	0.000	0.008	0.2968	0.5132	0.0001	4.69E-07
341		0.00	0.000	0.011	0.2957	0.5130	0.0001	4.69E-07
342		0.00	0.000	0.011	0.2947	0.5129	0.0001	4.68E-07
343		0.00	0.000	0.010	0.2936	0.5127	0.0001	4.68E-07
344		0.04	0.000	0.027	0.2953	0.5126	0.0001	4.68E-07

345		0.10	0.000	0.030	0.3026	0.5124	0.0001	4.68E-07
346		0.00	0.000	0.012	0.3014	0.5123	0.0001	4.68E-07
347		0.00	0.000	0.010	0.3004	0.5121	0.0001	4.68E-07
348		0.00	0.000	0.009	0.2994	0.5120	0.0001	4.68E-07
349		0.00	0.000	0.009	0.2985	0.5118	0.0001	4.68E-07
350		0.00	0.000	0.009	0.2977	0.5117	0.0001	4.67E-07
351		0.02	0.000	0.020	0.2974	0.5115	0.0001	4.67E-07
352		0.00	0.000	0.010	0.2966	0.5114	0.0001	4.67E-07
353	*	0.00	0.000	0.010	0.2956	0.5112	0.0001	4.67E-07
354	*	0.00	0.000	0.000	0.2956	0.5111	0.0001	4.67E-07
355	*	0.00	0.000	0.000	0.2956	0.5109	0.0001	4.67E-07
356	*	0.00	0.000	0.000	0.2956	0.5108	0.0001	4.67E-07
357	*	0.00	0.000	0.000	0.2956	0.5106	0.0001	4.67E-07
358	*	0.00	0.000	0.000	0.2956	0.5105	0.0001	4.66E-07
359	*	0.00	0.000	0.000	0.2956	0.5103	0.0001	4.66E-07
360	*	0.14	0.000	0.045	0.2976	0.5102	0.0001	4.66E-07
361	*	0.20	0.000	0.021	0.2996	0.5100	0.0001	4.66E-07
362		0.08	0.147	0.039	0.3123	0.5099	0.0001	4.66E-07
363		0.01	0.000	0.056	0.3075	0.5097	0.0001	4.66E-07
364		0.00	0.000	0.034	0.3044	0.5096	0.0001	4.66E-07
365	*	0.17	0.000	0.030	0.3064	0.5094	0.0001	4.66E-07

* = Frozen (air or soil)

Annual Totals for Year 13			
	inches	cubic feet	percent
Precipitation	28.23	102,472.1	100.00
Runoff	16.712	60,665.6	59.20
Evapotranspiration	11.976	43,472.6	42.42
Recirculation into Layer 1	0.0222	80.7	0.08
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0222	80.7	0.08
Percolation/Leakage through Layer 5	0.000178	0.6478	0.00
Average Head on Top of Layer 4	0.5375	---	---
Change in Water Storage	-0.4592	-1,666.7	-1.63
Soil Water at Start of Year	1,407.0650	5,107,646.1	4984.43
Soil Water at End of Year	1,406.9235	5,107,132.3	4983.92
Snow Water at Start of Year	0.4392	1,594.2	1.56
Snow Water at End of Year	0.1216	441.2	0.43
Annual Water Budget Balance	-0.0223	-80.8	-0.08

Daily Output for Year 14

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.36	0.000	0.015	0.3083	0.5093	0.0001	4.65E-07
2			0.16	0.452	0.000	0.3211	0.5091	0.0001	4.65E-07
3	*		0.03	0.000	0.030	0.3230	0.5090	0.0001	4.65E-07
4	*		0.14	0.000	0.019	0.3250	0.5088	0.0001	4.65E-07
5			0.00	0.000	0.058	0.3300	0.5087	0.0001	4.65E-07
6			0.02	0.000	0.042	0.3277	0.5086	0.0001	4.65E-07
7			0.00	0.000	0.066	0.3211	0.5085	0.0001	4.65E-07
8			0.25	0.082	0.116	0.3262	0.5084	0.0001	4.65E-07
9			0.00	0.000	0.065	0.3198	0.5083	0.0001	4.65E-07
10	*		0.00	0.000	0.031	0.3167	0.5081	0.0001	4.64E-07
11	*		0.00	0.000	0.000	0.3167	0.5080	0.0001	4.64E-07
12			0.00	0.000	0.051	0.3116	0.5078	0.0001	4.64E-07
13			0.00	0.000	0.061	0.3054	0.5077	0.0001	4.64E-07
14			0.00	0.000	0.052	0.3002	0.5075	0.0001	4.64E-07
15			0.20	0.049	0.104	0.3050	0.5074	0.0001	4.64E-07
16			0.03	0.000	0.094	0.2988	0.5072	0.0001	4.64E-07
17			0.00	0.000	0.170	0.2818	0.5071	0.0001	4.64E-07
18			0.00	0.000	0.039	0.2779	0.5069	0.0001	4.63E-07
19			0.00	0.000	0.008	0.2771	0.5068	0.0001	4.63E-07
20			0.00	0.000	0.001	0.2770	0.5066	0.0001	4.63E-07
21			0.00	0.000	0.000	0.2770	0.5065	0.0001	4.63E-07
22			0.00	0.000	0.000	0.2770	0.5063	0.0001	4.63E-07
23			0.00	0.000	0.000	0.2770	0.5062	0.0001	4.63E-07
24			0.00	0.000	0.000	0.2770	0.5060	0.0001	4.63E-07

25	*	0.21	0.000	0.054	0.2790	0.5059	0.0001	4.63E-07
26		0.00	0.000	0.083	0.2842	0.5057	0.0001	4.62E-07
27	*	0.04	0.000	0.050	0.2834	0.5056	0.0001	4.62E-07
28		0.15	0.004	0.028	0.2953	0.5054	0.0001	4.62E-07
29		0.00	0.000	0.009	0.2944	0.5053	0.0001	4.62E-07
30		0.00	0.000	0.014	0.2930	0.5051	0.0001	4.62E-07
31		0.00	0.000	0.013	0.2917	0.5050	0.0001	4.62E-07
32		0.00	0.000	0.012	0.2905	0.5048	0.0001	4.62E-07
33		0.00	0.000	0.012	0.2893	0.5047	0.0001	4.62E-07
34		0.00	0.000	0.011	0.2882	0.5046	0.0001	4.61E-07
35		0.89	0.708	0.035	0.3029	0.5044	0.0001	4.61E-07
36		0.07	0.000	0.092	0.3009	0.5043	0.0001	4.61E-07
37		0.00	0.000	0.047	0.2962	0.5041	0.0001	4.61E-07
38		0.26	0.090	0.110	0.3026	0.5040	0.0001	4.61E-07
39		0.00	0.000	0.039	0.2987	0.5038	0.0001	4.61E-07
40		0.00	0.000	0.027	0.2960	0.5037	0.0001	4.61E-07
41		0.00	0.000	0.071	0.2889	0.5035	0.0001	4.61E-07
42		0.00	0.000	0.033	0.2856	0.5034	0.0001	4.60E-07
43		0.00	0.000	0.033	0.2823	0.5032	0.0001	4.60E-07
44		0.00	0.000	0.031	0.2792	0.5031	0.0001	4.60E-07
45		0.00	0.000	0.019	0.2773	0.5029	0.0001	4.60E-07
46		0.00	0.000	0.003	0.2771	0.5028	0.0001	4.60E-07
47		0.00	0.000	0.001	0.2770	0.5026	0.0001	4.60E-07
48		0.12	0.000	0.021	0.2874	0.5025	0.0001	4.60E-07
49		0.00	0.000	0.010	0.2864	0.5023	0.0001	4.60E-07
50		0.00	0.000	0.012	0.2853	0.5022	0.0001	4.60E-07
51		0.00	0.000	0.014	0.2839	0.5021	0.0001	4.59E-07
52	*	0.00	0.000	0.000	0.2839	0.5019	0.0001	4.59E-07
53		0.00	0.000	0.013	0.2826	0.5018	0.0001	4.59E-07
54		0.18	0.042	0.031	0.2937	0.5016	0.0001	4.59E-07
55		0.00	0.000	0.009	0.2928	0.5015	0.0001	4.59E-07
56	*	0.05	0.000	0.051	0.2928	0.5013	0.0001	4.59E-07

57		0.00	0.000	0.012	0.2916	0.5012	0.0001	4.59E-07
58		0.00	0.000	0.012	0.2904	0.5010	0.0001	4.59E-07
59		0.04	0.000	0.027	0.2913	0.5009	0.0001	4.58E-07
60		0.00	0.000	0.012	0.2902	0.5007	0.0001	4.58E-07
61	*	0.44	0.000	0.033	0.2921	0.5006	0.0001	4.58E-07
62	*	0.03	0.000	0.032	0.2941	0.5004	0.0001	4.58E-07
63		0.00	0.131	0.107	0.3069	0.5003	0.0001	4.58E-07
64		0.17	0.033	0.031	0.3173	0.5002	0.0001	4.58E-07
65		0.00	0.000	0.071	0.3102	0.5000	0.0001	4.58E-07
66		0.00	0.000	0.069	0.3034	0.4999	0.0001	4.58E-07
67		0.22	0.064	0.079	0.3113	0.4997	0.0001	4.57E-07
68		0.00	0.000	0.055	0.3058	0.4996	0.0001	4.57E-07
69	*	0.00	0.000	0.033	0.3026	0.4994	0.0001	4.57E-07
70	*	0.00	0.000	0.000	0.3026	0.4993	0.0001	4.57E-07
71	*	0.06	0.000	0.031	0.3046	0.4991	0.0001	4.57E-07
72	*	0.34	0.000	0.010	0.3065	0.4990	0.0001	4.57E-07
73	*	0.11	0.000	0.020	0.3085	0.4988	0.0001	4.57E-07
74		0.00	0.239	0.025	0.3213	0.4987	0.0001	4.57E-07
75		0.28	0.138	0.112	0.3248	0.4985	0.0001	4.56E-07
76		0.00	0.000	0.041	0.3207	0.4984	0.0001	4.56E-07
77		0.51	0.290	0.084	0.3347	0.4983	0.0001	4.56E-07
78		0.48	0.315	0.115	0.3394	0.4981	0.0001	4.56E-07
79		0.00	0.000	0.168	0.3227	0.4980	0.0001	4.56E-07
80		0.00	0.000	0.172	0.3055	0.4978	0.0001	4.56E-07
81		0.00	0.000	0.159	0.2897	0.4977	0.0001	4.56E-07
82		0.00	0.000	0.109	0.2788	0.4975	0.0001	4.56E-07
83		0.02	0.000	0.030	0.2778	0.4974	0.0001	4.55E-07
84		0.00	0.000	0.007	0.2772	0.4972	0.0001	4.55E-07
85		0.00	0.000	0.001	0.2771	0.4971	0.0001	4.55E-07
86		0.00	0.000	0.000	0.2770	0.4969	0.0001	4.55E-07
87		0.00	0.000	0.000	0.2770	0.4968	0.0001	4.55E-07
88		0.00	0.000	0.000	0.2770	0.4967	0.0001	4.55E-07

89		0.02	0.000	0.013	0.2774	0.4965	0.0001	4.55E-07
90		0.52	0.321	0.041	0.2933	0.4964	0.0001	4.55E-07
91	*	0.20	0.000	0.084	0.2953	0.4962	0.0001	4.55E-07
92		0.00	0.000	0.110	0.2941	0.4961	0.0001	4.54E-07
93		0.68	0.505	0.039	0.3075	0.4959	0.0001	4.54E-07
94		0.00	0.000	0.148	0.2930	0.4958	0.0001	4.54E-07
95		0.00	0.000	0.137	0.2793	0.4956	0.0001	4.54E-07
96		0.00	0.000	0.021	0.2776	0.4955	0.0001	4.54E-07
97		0.00	0.000	0.006	0.2771	0.4954	0.0001	4.54E-07
98		0.13	0.000	0.023	0.2878	0.4952	0.0001	4.54E-07
99		0.18	0.032	0.034	0.2996	0.4951	0.0001	4.54E-07
100		0.02	0.000	0.025	0.2990	0.4949	0.0001	4.53E-07
101		0.06	0.000	0.037	0.3015	0.4948	0.0001	4.53E-07
102		0.30	0.127	0.045	0.3141	0.4946	0.0001	4.53E-07
103		0.36	0.169	0.159	0.3174	0.4945	0.0001	4.53E-07
104		0.00	0.000	0.164	0.3010	0.4943	0.0001	4.53E-07
105		0.00	0.000	0.108	0.2902	0.4942	0.0001	4.53E-07
106		0.00	0.000	0.045	0.2857	0.4940	0.0001	4.53E-07
107		1.46	1.234	0.062	0.3016	0.4939	0.0001	4.53E-07
108		0.00	0.000	0.151	0.2866	0.4938	0.0001	4.52E-07
109		0.38	0.136	0.264	0.2850	0.4936	0.0001	4.52E-07
110		0.20	0.055	0.074	0.2921	0.4935	0.0001	4.52E-07
111		0.09	0.000	0.149	0.2857	0.4933	0.0001	4.52E-07
112		0.29	0.092	0.139	0.2917	0.4932	0.0001	4.52E-07
113		0.52	0.331	0.074	0.3032	0.4930	0.0001	4.52E-07
114		0.04	0.000	0.085	0.2986	0.4929	0.0001	4.52E-07
115		1.13	0.763	0.238	0.3120	0.4927	0.0001	4.52E-07
116		0.29	0.107	0.277	0.3030	0.4926	0.0001	4.51E-07
117		0.03	0.000	0.160	0.2899	0.4925	0.0001	4.51E-07
118		0.00	0.000	0.072	0.2827	0.4923	0.0001	4.51E-07
119		0.00	0.000	0.044	0.2783	0.4922	0.0001	4.51E-07
120	*	0.92	0.000	0.060	0.2803	0.4920	0.0001	4.51E-07

121	0.00	0.655	0.000	0.2946	0.4919	0.0001	4.51E-07
122	0.00	0.000	0.142	0.2841	0.4917	0.0001	4.51E-07
123	0.00	0.000	0.044	0.2797	0.4916	0.0001	4.51E-07
124	0.00	0.000	0.021	0.2777	0.4915	0.0001	4.51E-07
125	0.16	0.000	0.050	0.2884	0.4913	0.0001	4.50E-07
126	0.00	0.000	0.025	0.2860	0.4912	0.0001	4.50E-07
127	0.00	0.000	0.027	0.2833	0.4911	0.0001	4.50E-07
128	0.00	0.000	0.025	0.2808	0.4909	0.0001	4.50E-07
129	0.00	0.000	0.026	0.2786	0.4908	0.0001	4.50E-07
130	0.34	0.160	0.048	0.2920	0.4906	0.0001	4.50E-07
131	0.24	0.080	0.092	0.2987	0.4905	0.0001	4.50E-07
132	0.12	0.000	0.183	0.2924	0.4903	0.0001	4.50E-07
133	0.00	0.000	0.090	0.2834	0.4902	0.0001	4.49E-07
134	0.45	0.226	0.076	0.2979	0.4900	0.0001	4.49E-07
135	0.00	0.000	0.061	0.2921	0.4899	0.0001	4.49E-07
136	0.00	0.000	0.035	0.2887	0.4898	0.0001	4.49E-07
137	0.00	0.000	0.028	0.2859	0.4896	0.0001	4.49E-07
138	0.00	0.000	0.023	0.2836	0.4895	0.0001	4.49E-07
139	0.00	0.000	0.026	0.2810	0.4893	0.0001	4.49E-07
140	0.00	0.000	0.023	0.2787	0.4892	0.0001	4.49E-07
141	0.00	0.000	0.015	0.2773	0.4890	0.0001	4.48E-07
142	0.00	0.000	0.003	0.2770	0.4889	0.0001	4.48E-07
143	0.00	0.000	0.002	0.2770	0.4888	0.0001	4.48E-07
144	0.46	0.267	0.040	0.2921	0.4886	0.0001	4.48E-07
145	0.00	0.000	0.039	0.2882	0.4885	0.0001	4.48E-07
146	0.00	0.000	0.015	0.2867	0.4883	0.0001	4.48E-07
147	0.00	0.000	0.015	0.2852	0.4882	0.0001	4.48E-07
148	0.28	0.111	0.040	0.2980	0.4880	0.0001	4.48E-07
149	0.10	0.000	0.167	0.2909	0.4879	0.0001	4.48E-07
150	0.01	0.000	0.025	0.2894	0.4878	0.0001	4.47E-07
151	0.17	0.019	0.038	0.3011	0.4876	0.0001	4.47E-07
152	0.60	0.276	0.339	0.2995	0.4875	0.0001	4.47E-07

153	0.01	0.000	0.098	0.2902	0.4873	0.0001	4.47E-07
154	0.00	0.000	0.093	0.2810	0.4872	0.0001	4.47E-07
155	1.44	1.208	0.076	0.2970	0.4871	0.0001	4.47E-07
156	0.23	0.083	0.080	0.3034	0.4869	0.0001	4.47E-07
157	0.54	0.273	0.194	0.3102	0.4868	0.0001	4.47E-07
158	0.33	0.136	0.208	0.3083	0.4866	0.0001	4.46E-07
159	0.00	0.000	0.183	0.2900	0.4865	0.0001	4.46E-07
160	0.00	0.000	0.087	0.2813	0.4863	0.0001	4.46E-07
161	0.00	0.000	0.032	0.2781	0.4862	0.0001	4.46E-07
162	0.00	0.000	0.008	0.2773	0.4861	0.0001	4.46E-07
163	0.02	0.000	0.021	0.2775	0.4859	0.0001	4.46E-07
164	0.60	0.383	0.066	0.2929	0.4858	0.0001	4.46E-07
165	0.00	0.000	0.112	0.2817	0.4856	0.0001	4.46E-07
166	0.40	0.204	0.060	0.2951	0.4855	0.0001	4.46E-07
167	1.36	0.996	0.249	0.3062	0.4853	0.0001	4.45E-07
168	0.16	0.011	0.147	0.3068	0.4852	0.0001	4.45E-07
169	0.19	0.030	0.163	0.3061	0.4851	0.0001	4.45E-07
170	0.00	0.000	0.150	0.2911	0.4849	0.0001	4.45E-07
171	0.45	0.164	0.157	0.3043	0.4848	0.0001	4.45E-07
172	0.01	0.000	0.194	0.2864	0.4846	0.0001	4.45E-07
173	0.00	0.000	0.055	0.2809	0.4845	0.0001	4.45E-07
174	0.00	0.000	0.031	0.2779	0.4844	0.0001	4.45E-07
175	0.00	0.000	0.007	0.2772	0.4842	0.0001	4.44E-07
176	2.02	1.803	0.060	0.2927	0.4841	0.0001	4.44E-07
177	0.00	0.000	0.118	0.2810	0.4839	0.0001	4.44E-07
178	0.00	0.000	0.030	0.2780	0.4838	0.0001	4.44E-07
179	0.05	0.000	0.035	0.2797	0.4836	0.0001	4.44E-07
180	0.11	0.000	0.027	0.2877	0.4835	0.0001	4.44E-07
181	0.46	0.274	0.065	0.3001	0.4834	0.0001	4.44E-07
182	0.00	0.000	0.020	0.2981	0.4832	0.0001	4.44E-07
183	0.00	0.000	0.033	0.2948	0.4831	0.0001	4.43E-07
184	0.00	0.000	0.031	0.2917	0.4829	0.0001	4.43E-07

185	0.00	0.000	0.025	0.2892	0.4828	0.0001	4.43E-07
186	0.00	0.000	0.025	0.2867	0.4827	0.0001	4.43E-07
187	0.00	0.000	0.029	0.2839	0.4825	0.0001	4.43E-07
188	0.70	0.495	0.047	0.2992	0.4824	0.0001	4.43E-07
189	0.21	0.061	0.098	0.3040	0.4822	0.0001	4.43E-07
190	0.79	0.509	0.175	0.3148	0.4821	0.0001	4.43E-07
191	0.07	0.000	0.240	0.2975	0.4820	0.0001	4.43E-07
192	0.43	0.136	0.350	0.2919	0.4818	0.0001	4.42E-07
193	0.19	0.041	0.115	0.2952	0.4817	0.0001	4.42E-07
194	0.46	0.173	0.244	0.2994	0.4815	0.0001	4.42E-07
195	0.00	0.000	0.090	0.2904	0.4814	0.0001	4.42E-07
196	0.40	0.122	0.334	0.2851	0.4812	0.0001	4.42E-07
197	0.26	0.084	0.122	0.2902	0.4811	0.0001	4.42E-07
198	0.00	0.000	0.107	0.2795	0.4810	0.0001	4.42E-07
199	0.36	0.141	0.155	0.2860	0.4808	0.0001	4.42E-07
200	0.00	0.000	0.066	0.2794	0.4807	0.0001	4.41E-07
201	0.00	0.000	0.020	0.2773	0.4805	0.0001	4.41E-07
202	0.00	0.000	0.003	0.2771	0.4804	0.0001	4.41E-07
203	2.47	2.249	0.065	0.2926	0.4803	0.0001	4.41E-07
204	0.00	0.000	0.102	0.2824	0.4801	0.0001	4.41E-07
205	0.00	0.000	0.041	0.2784	0.4800	0.0001	4.41E-07
206	0.00	0.000	0.010	0.2773	0.4798	0.0001	4.41E-07
207	0.00	0.000	0.003	0.2771	0.4797	0.0001	4.41E-07
208	0.00	0.000	0.001	0.2770	0.4796	0.0001	4.41E-07
209	0.00	0.000	0.000	0.2770	0.4794	0.0001	4.40E-07
210	0.00	0.000	0.000	0.2770	0.4793	0.0001	4.40E-07
211	0.00	0.000	0.000	0.2770	0.4791	0.0001	4.40E-07
212	0.00	0.000	0.000	0.2770	0.4790	0.0001	4.40E-07
213	0.00	0.000	0.000	0.2770	0.4789	0.0001	4.40E-07
214	0.00	0.000	0.000	0.2770	0.4787	0.0001	4.40E-07
215	0.00	0.000	0.000	0.2770	0.4786	0.0001	4.40E-07
216	0.00	0.000	0.000	0.2770	0.4784	0.0001	4.40E-07

217	0.00	0.000	0.000	0.2770	0.4783	0.0001	4.39E-07
218	0.00	0.000	0.000	0.2770	0.4782	0.0001	4.39E-07
219	0.02	0.000	0.017	0.2776	0.4780	0.0001	4.39E-07
220	0.00	0.000	0.003	0.2773	0.4779	0.0001	4.39E-07
221	0.00	0.000	0.002	0.2771	0.4777	0.0001	4.39E-07
222	0.00	0.000	0.001	0.2770	0.4776	0.0001	4.39E-07
223	0.21	0.055	0.034	0.2893	0.4775	0.0001	4.39E-07
224	0.00	0.000	0.013	0.2880	0.4773	0.0001	4.39E-07
225	0.00	0.000	0.021	0.2859	0.4772	0.0001	4.39E-07
226	0.00	0.000	0.021	0.2838	0.4770	0.0001	4.38E-07
227	0.00	0.000	0.016	0.2823	0.4769	0.0001	4.38E-07
228	0.01	0.000	0.023	0.2812	0.4768	0.0001	4.38E-07
229	0.51	0.325	0.044	0.2959	0.4766	0.0001	4.38E-07
230	0.02	0.000	0.035	0.2947	0.4765	0.0001	4.38E-07
231	0.00	0.000	0.018	0.2928	0.4763	0.0001	4.38E-07
232	0.00	0.000	0.017	0.2911	0.4762	0.0001	4.38E-07
233	0.00	0.000	0.015	0.2896	0.4761	0.0001	4.38E-07
234	1.18	0.999	0.038	0.3037	0.4759	0.0001	4.37E-07
235	0.00	0.000	0.127	0.2909	0.4758	0.0001	4.37E-07
236	0.00	0.000	0.108	0.2802	0.4757	0.0001	4.37E-07
237	0.00	0.000	0.024	0.2778	0.4755	0.0001	4.37E-07
238	0.00	0.000	0.006	0.2772	0.4754	0.0001	4.37E-07
239	0.00	0.000	0.002	0.2771	0.4752	0.0001	4.37E-07
240	0.00	0.000	0.001	0.2770	0.4751	0.0001	4.37E-07
241	0.30	0.128	0.045	0.2892	0.4750	0.0001	4.37E-07
242	0.02	0.000	0.026	0.2883	0.4748	0.0001	4.37E-07
243	0.78	0.590	0.051	0.3023	0.4747	0.0001	4.36E-07
244	0.02	0.000	0.104	0.2936	0.4745	0.0001	4.36E-07
245	0.00	0.000	0.019	0.2917	0.4744	0.0001	4.36E-07
246	0.00	0.000	0.019	0.2897	0.4743	0.0001	4.36E-07
247	0.00	0.000	0.018	0.2880	0.4741	0.0001	4.36E-07
248	0.00	0.000	0.020	0.2860	0.4740	0.0001	4.36E-07

249	0.00	0.000	0.018	0.2842	0.4738	0.0001	4.36E-07
250	0.23	0.070	0.040	0.2959	0.4737	0.0001	4.36E-07
251	0.00	0.000	0.099	0.2861	0.4736	0.0001	4.36E-07
252	0.00	0.000	0.018	0.2843	0.4734	0.0001	4.35E-07
253	0.00	0.000	0.013	0.2829	0.4733	0.0001	4.35E-07
254	0.00	0.000	0.012	0.2817	0.4732	0.0001	4.35E-07
255	0.00	0.000	0.012	0.2806	0.4730	0.0001	4.35E-07
256	0.00	0.000	0.011	0.2795	0.4729	0.0001	4.35E-07
257	0.00	0.000	0.013	0.2782	0.4727	0.0001	4.35E-07
258	0.00	0.000	0.010	0.2772	0.4726	0.0001	4.35E-07
259	0.11	0.000	0.024	0.2854	0.4725	0.0001	4.35E-07
260	0.02	0.000	0.019	0.2855	0.4723	0.0001	4.34E-07
261	0.00	0.000	0.006	0.2848	0.4722	0.0001	4.34E-07
262	0.00	0.000	0.006	0.2842	0.4721	0.0001	4.34E-07
263	0.00	0.000	0.008	0.2834	0.4719	0.0001	4.34E-07
264	0.00	0.000	0.008	0.2826	0.4718	0.0001	4.34E-07
265	0.00	0.000	0.008	0.2818	0.4716	0.0001	4.34E-07
266	0.44	0.257	0.034	0.2967	0.4715	0.0001	4.34E-07
267	0.00	0.000	0.081	0.2887	0.4714	0.0001	4.34E-07
268	0.00	0.000	0.008	0.2878	0.4712	0.0001	4.34E-07
269	0.00	0.000	0.008	0.2870	0.4711	0.0001	4.33E-07
270	0.00	0.000	0.008	0.2862	0.4709	0.0001	4.33E-07
271	0.66	0.469	0.033	0.3016	0.4708	0.0001	4.33E-07
272	0.03	0.000	0.080	0.2969	0.4707	0.0001	4.33E-07
273	0.79	0.524	0.124	0.3106	0.4705	0.0001	4.33E-07
274	0.21	0.070	0.074	0.3176	0.4704	0.0001	4.33E-07
275	0.00	0.000	0.075	0.3101	0.4703	0.0001	4.33E-07
276	0.00	0.000	0.076	0.3025	0.4701	0.0001	4.33E-07
277	0.30	0.106	0.134	0.3082	0.4700	0.0001	4.32E-07
278	0.01	0.000	0.192	0.2897	0.4698	0.0001	4.32E-07
279	0.00	0.000	0.106	0.2791	0.4697	0.0001	4.32E-07
280	0.00	0.000	0.017	0.2775	0.4696	0.0001	4.32E-07

281		0.00	0.000	0.004	0.2771	0.4695	0.0001	4.32E-07
282		0.00	0.000	0.001	0.2770	0.4693	0.0001	4.32E-07
283		0.00	0.000	0.000	0.2770	0.4692	0.0001	4.32E-07
284		0.00	0.000	0.000	0.2770	0.4690	0.0001	4.32E-07
285		0.00	0.000	0.000	0.2770	0.4689	0.0001	4.32E-07
286	*	0.00	0.000	0.000	0.2770	0.4688	0.0001	4.31E-07
287	*	0.03	0.000	0.031	0.2770	0.4686	0.0001	4.31E-07
288		0.02	0.000	0.014	0.2773	0.4685	0.0001	4.31E-07
289		0.00	0.000	0.002	0.2771	0.4684	0.0001	4.31E-07
290		0.00	0.000	0.001	0.2770	0.4682	0.0001	4.31E-07
291		0.00	0.000	0.000	0.2770	0.4681	0.0001	4.31E-07
292		0.84	0.634	0.042	0.2933	0.4680	0.0001	4.31E-07
293		0.00	0.000	0.009	0.2924	0.4678	0.0001	4.31E-07
294		0.02	0.000	0.027	0.2920	0.4677	0.0001	4.31E-07
295		0.34	0.162	0.041	0.3059	0.4675	0.0001	4.30E-07
296		1.25	1.053	0.079	0.3174	0.4674	0.0001	4.30E-07
297		0.59	0.345	0.130	0.3289	0.4673	0.0001	4.30E-07
298		1.86	1.636	0.110	0.3405	0.4671	0.0001	4.30E-07
299		0.00	0.000	0.051	0.3353	0.4670	0.0001	4.30E-07
300		0.00	0.000	0.072	0.3282	0.4669	0.0001	4.30E-07
301		0.20	0.042	0.108	0.3333	0.4667	0.0001	4.30E-07
302		0.00	0.000	0.077	0.3255	0.4666	0.0001	4.30E-07
303		0.05	0.000	0.062	0.3248	0.4665	0.0001	4.30E-07
304	*	0.00	0.000	0.000	0.3248	0.4663	0.0001	4.29E-07
305		0.00	0.000	0.049	0.3199	0.4662	0.0001	4.29E-07
306		0.00	0.000	0.059	0.3140	0.4660	0.0001	4.29E-07
307	*	0.22	0.000	0.030	0.3160	0.4659	0.0001	4.29E-07
308	*	0.00	0.000	0.023	0.3180	0.4658	0.0001	4.29E-07
309		0.00	0.000	0.096	0.3213	0.4656	0.0001	4.29E-07
310		0.01	0.000	0.074	0.3147	0.4655	0.0001	4.29E-07
311		0.00	0.000	0.091	0.3057	0.4654	0.0001	4.29E-07
312		0.00	0.000	0.090	0.2967	0.4652	0.0001	4.28E-07

313		0.00	0.000	0.039	0.2928	0.4651	0.0001	4.28E-07
314		0.00	0.000	0.055	0.2873	0.4650	0.0001	4.28E-07
315		0.00	0.000	0.060	0.2813	0.4648	0.0001	4.28E-07
316		0.49	0.267	0.078	0.2957	0.4647	0.0001	4.28E-07
317		0.54	0.353	0.069	0.3072	0.4645	0.0001	4.28E-07
318	*	0.00	0.000	0.035	0.3037	0.4644	0.0001	4.28E-07
319		0.00	0.000	0.053	0.2985	0.4643	0.0001	4.28E-07
320		0.00	0.000	0.051	0.2934	0.4641	0.0001	4.28E-07
321		0.00	0.000	0.031	0.2903	0.4640	0.0001	4.27E-07
322		0.00	0.000	0.042	0.2861	0.4639	0.0001	4.27E-07
323		0.00	0.000	0.031	0.2831	0.4637	0.0001	4.27E-07
324	*	0.62	0.000	0.030	0.2850	0.4636	0.0001	4.27E-07
325		0.14	0.085	0.000	0.2994	0.4635	0.0001	4.27E-07
326		0.00	0.069	0.024	0.3110	0.4633	0.0001	4.27E-07
327		0.00	0.002	0.039	0.3213	0.4632	0.0001	4.27E-07
328		0.00	0.002	0.090	0.3254	0.4631	0.0001	4.27E-07
329		0.37	0.202	0.093	0.3332	0.4629	0.0001	4.27E-07
330		1.07	0.853	0.140	0.3410	0.4628	0.0001	4.26E-07
331		0.00	0.000	0.086	0.3324	0.4627	0.0001	4.26E-07
332		0.00	0.000	0.093	0.3232	0.4625	0.0001	4.26E-07
333		0.00	0.000	0.048	0.3184	0.4624	0.0001	4.26E-07
334		0.00	0.000	0.067	0.3117	0.4623	0.0001	4.26E-07
335		0.00	0.000	0.084	0.3033	0.4621	0.0001	4.26E-07
336		0.00	0.000	0.046	0.2987	0.4620	0.0001	4.26E-07
337		0.00	0.000	0.035	0.2952	0.4619	0.0001	4.26E-07
338		0.00	0.000	0.070	0.2882	0.4617	0.0001	4.26E-07
339		0.00	0.000	0.076	0.2805	0.4616	0.0001	4.25E-07
340		0.00	0.000	0.029	0.2777	0.4615	0.0001	4.25E-07
341		0.00	0.000	0.007	0.2770	0.4613	0.0001	4.25E-07
342		0.00	0.000	0.000	0.2770	0.4612	0.0001	4.25E-07
343		0.00	0.000	0.000	0.2770	0.4611	0.0001	4.25E-07
344	*	0.11	0.000	0.027	0.2790	0.4609	0.0001	4.25E-07

345	*	0.06	0.000	0.039	0.2810	0.4608	0.0001	4.25E-07
346		0.00	0.000	0.069	0.2804	0.4607	0.0001	4.25E-07
347		0.00	0.000	0.011	0.2793	0.4605	0.0001	4.25E-07
348		0.00	0.000	0.005	0.2788	0.4604	0.0001	4.24E-07
349	*	0.00	0.000	0.005	0.2783	0.4603	0.0001	4.24E-07
350		0.00	0.000	0.004	0.2779	0.4601	0.0001	4.24E-07
351	*	0.00	0.000	0.004	0.2776	0.4600	0.0001	4.24E-07
352		0.00	0.000	0.003	0.2773	0.4598	0.0001	4.24E-07
353		0.00	0.000	0.002	0.2771	0.4597	0.0001	4.24E-07
354		0.00	0.000	0.000	0.2770	0.4596	0.0001	4.24E-07
355		0.31	0.134	0.038	0.2904	0.4594	0.0001	4.24E-07
356		0.57	0.417	0.037	0.3020	0.4593	0.0001	4.24E-07
357		0.03	0.000	0.033	0.3017	0.4592	0.0001	4.23E-07
358		0.00	0.000	0.021	0.2996	0.4591	0.0001	4.23E-07
359		0.00	0.000	0.032	0.2964	0.4589	0.0001	4.23E-07
360	*	0.21	0.000	0.035	0.2983	0.4588	0.0001	4.23E-07
361	*	0.11	0.000	0.030	0.3003	0.4587	0.0001	4.23E-07
362	*	0.00	0.000	0.041	0.3023	0.4585	0.0001	4.23E-07
363		0.00	0.001	0.090	0.3089	0.4584	0.0001	4.23E-07
364		0.05	0.000	0.046	0.3095	0.4583	0.0001	4.23E-07
365		0.00	0.000	0.035	0.3060	0.4581	0.0001	4.22E-07

* = Frozen (air or soil)

Annual Totals for Year 14			
	inches	cubic feet	percent
Precipitation	47.32	171,759.9	100.00
Runoff	27.727	100,649.5	58.60
Evapotranspiration	19.731	71,624.9	41.70
Recirculation into Layer 1	0.0200	72.6	0.04
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0200	72.6	0.04
Percolation/Leakage through Layer 5	0.000162	0.5878	0.00
Average Head on Top of Layer 4	0.4833	---	---
Change in Water Storage	-0.1419	-515.0	-0.30
Soil Water at Start of Year	1,406.9235	5,107,132.3	2973.41
Soil Water at End of Year	1,406.9032	5,107,058.5	2973.37
Snow Water at Start of Year	0.1216	441.2	0.26
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0200	-72.6	-0.04

Daily Output for Year 15

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.017	0.3043	0.4580	0.0001	4.22E-07
2	*		0.00	0.000	0.000	0.3043	0.4579	0.0001	4.22E-07
3	*		0.00	0.000	0.000	0.3043	0.4577	0.0001	4.22E-07
4	*		0.00	0.000	0.000	0.3043	0.4576	0.0001	4.22E-07
5	*		0.00	0.000	0.001	0.3043	0.4575	0.0001	4.22E-07
6	*		0.00	0.000	0.021	0.3027	0.4573	0.0001	4.22E-07
7	*		0.00	0.000	0.016	0.3011	0.4572	0.0001	4.22E-07
8	*		0.00	0.000	0.000	0.3011	0.4571	0.0001	4.22E-07
9	*		0.00	0.000	0.000	0.3011	0.4569	0.0001	4.21E-07
10	*		0.00	0.000	0.000	0.3011	0.4568	0.0001	4.21E-07
11	*		0.00	0.000	0.000	0.3011	0.4567	0.0001	4.21E-07
12	*	*	0.00	0.000	0.000	0.3011	0.4565	0.0001	4.21E-07
13	*	*	0.00	0.000	0.000	0.3011	0.4564	0.0001	4.21E-07
14	*	*	0.01	0.000	0.007	0.3011	0.4562	0.0001	4.21E-07
15	*	*	0.10	0.000	0.051	0.3011	0.4561	0.0001	4.21E-07
16		*	0.06	0.000	0.103	0.3016	0.4560	0.0001	4.21E-07
17		*	0.06	0.000	0.020	0.3057	0.4558	0.0001	4.21E-07
18			0.30	0.110	0.099	0.3146	0.4557	0.0001	4.20E-07
19			0.39	0.184	0.092	0.3260	0.4556	0.0001	4.20E-07
20			0.00	0.000	0.063	0.3197	0.4555	0.0001	4.20E-07
21			0.00	0.000	0.160	0.3037	0.4554	0.0001	4.20E-07
22			0.00	0.000	0.183	0.2853	0.4553	0.0001	4.20E-07
23			0.06	0.000	0.101	0.2814	0.4551	0.0001	4.20E-07
24			0.00	0.000	0.016	0.2801	0.4550	0.0001	4.20E-07

25		0.00	0.000	0.017	0.2787	0.4549	0.0001	4.20E-07
26		0.05	0.000	0.024	0.2811	0.4547	0.0001	4.20E-07
27		0.43	0.252	0.051	0.2936	0.4546	0.0001	4.20E-07
28		0.00	0.000	0.045	0.2893	0.4545	0.0001	4.19E-07
29		0.00	0.000	0.019	0.2874	0.4543	0.0001	4.19E-07
30		0.00	0.000	0.017	0.2857	0.4542	0.0001	4.19E-07
31	*	0.00	0.000	0.000	0.2857	0.4541	0.0001	4.19E-07
32		0.00	0.000	0.016	0.2841	0.4539	0.0001	4.19E-07
33	*	0.00	0.000	0.000	0.2841	0.4538	0.0001	4.19E-07
34		0.04	0.000	0.032	0.2846	0.4537	0.0001	4.19E-07
35	*	0.33	0.000	0.022	0.2866	0.4536	0.0001	4.19E-07
36	*	0.00	0.000	0.025	0.2886	0.4534	0.0001	4.19E-07
37	*	0.00	0.000	0.018	0.2905	0.4533	0.0001	4.18E-07
38	*	0.00	0.000	0.034	0.2925	0.4532	0.0001	4.18E-07
39	*	0.21	0.000	0.000	0.2945	0.4530	0.0001	4.18E-07
40	*	0.17	0.000	0.017	0.2965	0.4529	0.0001	4.18E-07
41	*	0.00	0.000	0.033	0.2984	0.4528	0.0001	4.18E-07
42	*	0.00	0.000	0.039	0.3004	0.4526	0.0001	4.18E-07
43		0.00	0.217	0.026	0.3132	0.4525	0.0001	4.18E-07
44		0.00	0.000	0.025	0.3107	0.4524	0.0001	4.18E-07
45		0.00	0.000	0.037	0.3070	0.4522	0.0001	4.18E-07
46	*	0.00	0.000	0.000	0.3070	0.4521	0.0001	4.17E-07
47		0.00	0.000	0.043	0.3027	0.4520	0.0001	4.17E-07
48		0.00	0.000	0.055	0.2972	0.4518	0.0001	4.17E-07
49		0.00	0.000	0.036	0.2937	0.4517	0.0001	4.17E-07
50		0.00	0.000	0.052	0.2885	0.4516	0.0001	4.17E-07
51		0.00	0.000	0.065	0.2820	0.4514	0.0001	4.17E-07
52		0.00	0.000	0.043	0.2776	0.4513	0.0001	4.17E-07
53		0.00	0.000	0.006	0.2771	0.4512	0.0001	4.17E-07
54		0.06	0.000	0.024	0.2806	0.4510	0.0001	4.17E-07
55		1.25	1.070	0.055	0.2933	0.4509	0.0001	4.16E-07
56		0.00	0.000	0.047	0.2886	0.4508	0.0001	4.16E-07

57		0.13	0.000	0.080	0.2941	0.4506	0.0001	4.16E-07
58		0.00	0.000	0.036	0.2905	0.4505	0.0001	4.16E-07
59	*	0.00	0.000	0.039	0.2866	0.4504	0.0001	4.16E-07
60		0.00	0.000	0.066	0.2799	0.4502	0.0001	4.16E-07
61		0.38	0.156	0.108	0.2920	0.4501	0.0001	4.16E-07
62		0.31	0.106	0.114	0.3013	0.4500	0.0001	4.16E-07
63	*	0.16	0.000	0.062	0.3033	0.4499	0.0001	4.16E-07
64		0.97	0.922	0.000	0.3160	0.4497	0.0001	4.15E-07
65		0.00	0.000	0.089	0.3071	0.4496	0.0001	4.15E-07
66		0.00	0.000	0.090	0.2981	0.4495	0.0001	4.15E-07
67	*	0.00	0.000	0.045	0.2936	0.4493	0.0001	4.15E-07
68	*	0.05	0.000	0.045	0.2945	0.4492	0.0001	4.15E-07
69	*	0.00	0.000	0.000	0.2945	0.4491	0.0001	4.15E-07
70	*	0.00	0.000	0.000	0.2945	0.4489	0.0001	4.15E-07
71	*	0.00	0.000	0.000	0.2945	0.4488	0.0001	4.15E-07
72	*	0.00	0.000	0.004	0.2945	0.4487	0.0001	4.15E-07
73		0.03	0.000	0.083	0.2888	0.4486	0.0001	4.14E-07
74		0.03	0.000	0.105	0.2813	0.4485	0.0001	4.14E-07
75		0.34	0.111	0.116	0.2925	0.4484	0.0001	4.14E-07
76		0.19	0.049	0.066	0.3002	0.4482	0.0001	4.14E-07
77		0.00	0.000	0.042	0.2960	0.4481	0.0001	4.14E-07
78		0.00	0.000	0.105	0.2856	0.4480	0.0001	4.14E-07
79		0.13	0.000	0.094	0.2892	0.4478	0.0001	4.14E-07
80		0.40	0.195	0.069	0.3025	0.4477	0.0001	4.14E-07
81		0.01	0.000	0.053	0.2984	0.4476	0.0001	4.14E-07
82		0.13	0.000	0.169	0.2941	0.4475	0.0001	4.13E-07
83		0.00	0.000	0.063	0.2878	0.4473	0.0001	4.13E-07
84		0.00	0.000	0.035	0.2843	0.4472	0.0001	4.13E-07
85		0.00	0.000	0.028	0.2816	0.4471	0.0001	4.13E-07
86	*	0.00	0.000	0.000	0.2816	0.4469	0.0001	4.13E-07
87		0.00	0.000	0.030	0.2785	0.4468	0.0001	4.13E-07
88		0.00	0.000	0.018	0.2772	0.4467	0.0001	4.13E-07

89	0.06	0.000	0.024	0.2808	0.4465	0.0001	4.13E-07
90	0.00	0.000	0.003	0.2805	0.4464	0.0001	4.13E-07
91	0.00	0.000	0.013	0.2793	0.4463	0.0001	4.13E-07
92	0.57	0.376	0.046	0.2938	0.4461	0.0001	4.12E-07
93	0.01	0.000	0.042	0.2904	0.4460	0.0001	4.12E-07
94	0.00	0.000	0.044	0.2861	0.4459	0.0001	4.12E-07
95	0.00	0.000	0.076	0.2785	0.4458	0.0001	4.12E-07
96	0.00	0.000	0.012	0.2773	0.4456	0.0001	4.12E-07
97	0.14	0.000	0.027	0.2882	0.4455	0.0001	4.12E-07
98	0.00	0.000	0.018	0.2864	0.4454	0.0001	4.12E-07
99	0.00	0.000	0.021	0.2844	0.4452	0.0001	4.12E-07
100	0.13	0.000	0.041	0.2937	0.4451	0.0001	4.12E-07
101	0.01	0.000	0.021	0.2924	0.4450	0.0001	4.11E-07
102	0.02	0.000	0.030	0.2917	0.4448	0.0001	4.11E-07
103	0.00	0.000	0.017	0.2900	0.4447	0.0001	4.11E-07
104	0.02	0.000	0.026	0.2892	0.4446	0.0001	4.11E-07
105	0.00	0.000	0.015	0.2877	0.4445	0.0001	4.11E-07
106	0.00	0.000	0.015	0.2862	0.4443	0.0001	4.11E-07
107	0.00	0.000	0.014	0.2848	0.4442	0.0001	4.11E-07
108	2.07	1.879	0.040	0.2997	0.4441	0.0001	4.11E-07
109	0.00	0.000	0.073	0.2924	0.4439	0.0001	4.11E-07
110	0.00	0.000	0.110	0.2814	0.4438	0.0001	4.10E-07
111	0.00	0.000	0.036	0.2778	0.4437	0.0001	4.10E-07
112	0.00	0.000	0.007	0.2771	0.4435	0.0001	4.10E-07
113	0.00	0.000	0.001	0.2770	0.4434	0.0001	4.10E-07
114	0.00	0.000	0.000	0.2770	0.4433	0.0001	4.10E-07
115	0.00	0.000	0.000	0.2770	0.4432	0.0001	4.10E-07
116	0.00	0.000	0.000	0.2770	0.4430	0.0001	4.10E-07
117	0.00	0.000	0.000	0.2770	0.4429	0.0001	4.10E-07
118	0.00	0.000	0.000	0.2770	0.4428	0.0001	4.10E-07
119	0.40	0.214	0.043	0.2913	0.4426	0.0001	4.09E-07
120	0.25	0.091	0.042	0.3026	0.4425	0.0001	4.09E-07

121		0.00	0.000	0.084	0.2942	0.4424	0.0001	4.09E-07
122		0.00	0.000	0.015	0.2928	0.4423	0.0001	4.09E-07
123		0.00	0.000	0.014	0.2914	0.4421	0.0001	4.09E-07
124		0.00	0.000	0.013	0.2900	0.4420	0.0001	4.09E-07
125		0.00	0.000	0.013	0.2888	0.4419	0.0001	4.09E-07
126		0.00	0.000	0.012	0.2875	0.4417	0.0001	4.09E-07
127	*	0.00	0.000	0.012	0.2864	0.4416	0.0001	4.09E-07
128	*	0.00	0.000	0.000	0.2864	0.4415	0.0001	4.08E-07
129	*	0.19	0.000	0.080	0.2884	0.4413	0.0001	4.08E-07
130		0.00	0.000	0.103	0.2872	0.4412	0.0001	4.08E-07
131		0.36	0.181	0.038	0.3015	0.4411	0.0001	4.08E-07
132		0.00	0.000	0.061	0.2954	0.4410	0.0000	4.08E-07
133		0.00	0.000	0.015	0.2939	0.4408	0.0000	4.08E-07
134		0.00	0.000	0.013	0.2926	0.4407	0.0000	4.08E-07
135		0.00	0.000	0.011	0.2915	0.4406	0.0000	4.08E-07
136		0.00	0.000	0.011	0.2904	0.4404	0.0000	4.08E-07
137		0.00	0.000	0.011	0.2893	0.4403	0.0000	4.07E-07
138		0.00	0.000	0.011	0.2881	0.4402	0.0000	4.07E-07
139		0.00	0.000	0.011	0.2871	0.4401	0.0000	4.07E-07
140		0.63	0.432	0.038	0.3026	0.4399	0.0000	4.07E-07
141		0.00	0.000	0.155	0.2871	0.4398	0.0000	4.07E-07
142		0.00	0.000	0.084	0.2787	0.4397	0.0000	4.07E-07
143		0.00	0.000	0.014	0.2774	0.4395	0.0000	4.07E-07
144		0.00	0.000	0.003	0.2771	0.4394	0.0000	4.07E-07
145		0.00	0.000	0.001	0.2770	0.4393	0.0000	4.07E-07
146		0.00	0.000	0.000	0.2770	0.4392	0.0000	4.06E-07
147		0.00	0.000	0.000	0.2770	0.4390	0.0000	4.06E-07
148		0.00	0.000	0.000	0.2770	0.4389	0.0000	4.06E-07
149		0.04	0.000	0.021	0.2791	0.4388	0.0000	4.06E-07
150		0.21	0.050	0.034	0.2917	0.4386	0.0000	4.06E-07
151		0.00	0.000	0.012	0.2905	0.4385	0.0000	4.06E-07
152		0.00	0.000	0.018	0.2887	0.4384	0.0000	4.06E-07

153	0.00	0.000	0.015	0.2872	0.4383	0.0000	4.06E-07
154	0.00	0.000	0.016	0.2856	0.4381	0.0000	4.06E-07
155	0.00	0.000	0.015	0.2841	0.4380	0.0000	4.06E-07
156	0.00	0.000	0.015	0.2827	0.4379	0.0000	4.05E-07
157	0.00	0.000	0.016	0.2814	0.4377	0.0000	4.05E-07
158	0.00	0.000	0.014	0.2800	0.4376	0.0000	4.05E-07
159	0.00	0.000	0.017	0.2783	0.4375	0.0000	4.05E-07
160	0.00	0.000	0.012	0.2772	0.4374	0.0000	4.05E-07
161	0.00	0.000	0.001	0.2771	0.4372	0.0000	4.05E-07
162	0.00	0.000	0.003	0.2770	0.4371	0.0000	4.05E-07
163	0.31	0.144	0.038	0.2902	0.4370	0.0000	4.05E-07
164	0.20	0.061	0.029	0.3013	0.4369	0.0000	4.05E-07
165	0.04	0.000	0.026	0.3028	0.4367	0.0000	4.04E-07
166	0.00	0.000	0.013	0.3015	0.4366	0.0000	4.04E-07
167	0.44	0.273	0.038	0.3144	0.4365	0.0000	4.04E-07
168	0.01	0.000	0.171	0.2979	0.4363	0.0000	4.04E-07
169	0.14	0.000	0.035	0.3084	0.4362	0.0000	4.04E-07
170	0.01	0.000	0.085	0.3012	0.4361	0.0000	4.04E-07
171	0.03	0.000	0.032	0.3009	0.4360	0.0000	4.04E-07
172	0.17	0.017	0.035	0.3128	0.4358	0.0000	4.04E-07
173	0.07	0.000	0.092	0.3107	0.4357	0.0000	4.04E-07
174	1.33	1.080	0.126	0.3230	0.4356	0.0000	4.03E-07
175	0.00	0.000	0.169	0.3062	0.4355	0.0000	4.03E-07
176	0.00	0.000	0.170	0.2892	0.4353	0.0000	4.03E-07
177	0.00	0.000	0.096	0.2796	0.4352	0.0000	4.03E-07
178	0.26	0.104	0.066	0.2890	0.4351	0.0000	4.03E-07
179	0.35	0.101	0.246	0.2893	0.4349	0.0000	4.03E-07
180	0.06	0.000	0.041	0.2913	0.4348	0.0000	4.03E-07
181	0.04	0.000	0.039	0.2912	0.4347	0.0000	4.03E-07
182	0.12	0.000	0.039	0.2996	0.4346	0.0000	4.03E-07
183	0.00	0.000	0.086	0.2913	0.4344	0.0000	4.02E-07
184	0.27	0.107	0.043	0.3028	0.4343	0.0000	4.02E-07

185	0.64	0.312	0.243	0.3115	0.4342	0.0000	4.02E-07
186	0.02	0.000	0.073	0.3057	0.4341	0.0000	4.02E-07
187	0.27	0.096	0.161	0.3070	0.4339	0.0000	4.02E-07
188	0.17	0.027	0.113	0.3104	0.4338	0.0000	4.02E-07
189	0.00	0.000	0.091	0.3013	0.4337	0.0000	4.02E-07
190	0.00	0.000	0.159	0.2854	0.4335	0.0000	4.02E-07
191	0.00	0.000	0.063	0.2790	0.4334	0.0000	4.02E-07
192	0.00	0.000	0.015	0.2775	0.4333	0.0000	4.02E-07
193	0.11	0.000	0.030	0.2856	0.4332	0.0000	4.01E-07
194	0.38	0.192	0.063	0.2985	0.4330	0.0000	4.01E-07
195	0.00	0.000	0.018	0.2967	0.4329	0.0000	4.01E-07
196	0.88	0.692	0.055	0.3096	0.4328	0.0000	4.01E-07
197	0.00	0.000	0.074	0.3022	0.4327	0.0000	4.01E-07
198	0.00	0.000	0.070	0.2952	0.4325	0.0000	4.01E-07
199	0.00	0.000	0.159	0.2793	0.4324	0.0000	4.01E-07
200	0.39	0.153	0.164	0.2864	0.4323	0.0000	4.01E-07
201	0.00	0.000	0.061	0.2803	0.4322	0.0000	4.01E-07
202	0.00	0.000	0.026	0.2777	0.4321	0.0000	4.01E-07
203	0.00	0.000	0.005	0.2772	0.4320	0.0000	4.00E-07
204	0.00	0.000	0.001	0.2770	0.4319	0.0000	4.00E-07
205	0.00	0.000	0.000	0.2770	0.4318	0.0000	4.00E-07
206	0.00	0.000	0.000	0.2770	0.4317	0.0000	4.00E-07
207	0.00	0.000	0.000	0.2770	0.4315	0.0000	4.00E-07
208	0.00	0.000	0.000	0.2770	0.4314	0.0000	4.00E-07
209	0.00	0.000	0.000	0.2770	0.4313	0.0000	4.00E-07
210	0.29	0.126	0.039	0.2894	0.4311	0.0000	4.00E-07
211	0.00	0.000	0.015	0.2878	0.4310	0.0000	4.00E-07
212	0.00	0.000	0.023	0.2855	0.4309	0.0000	3.99E-07
213	0.00	0.000	0.024	0.2831	0.4308	0.0000	3.99E-07
214	0.00	0.000	0.022	0.2809	0.4306	0.0000	3.99E-07
215	0.00	0.000	0.019	0.2790	0.4305	0.0000	3.99E-07
216	0.00	0.000	0.015	0.2775	0.4304	0.0000	3.99E-07

217	0.00	0.000	0.003	0.2771	0.4303	0.0000	3.99E-07
218	0.00	0.000	0.001	0.2770	0.4301	0.0000	3.99E-07
219	0.00	0.000	0.000	0.2770	0.4300	0.0000	3.99E-07
220	0.00	0.000	0.000	0.2770	0.4299	0.0000	3.99E-07
221	0.00	0.000	0.002	0.2770	0.4298	0.0000	3.99E-07
222	0.07	0.000	0.024	0.2816	0.4296	0.0000	3.98E-07
223	0.00	0.000	0.011	0.2805	0.4295	0.0000	3.98E-07
224	0.00	0.000	0.013	0.2792	0.4294	0.0000	3.98E-07
225	0.00	0.000	0.005	0.2786	0.4293	0.0000	3.98E-07
226	0.00	0.000	0.006	0.2781	0.4291	0.0000	3.98E-07
227	0.06	0.000	0.027	0.2815	0.4290	0.0000	3.98E-07
228	0.00	0.000	0.015	0.2800	0.4289	0.0000	3.98E-07
229	1.12	0.940	0.048	0.2930	0.4288	0.0000	3.98E-07
230	0.00	0.000	0.107	0.2822	0.4286	0.0000	3.98E-07
231	0.00	0.000	0.027	0.2796	0.4285	0.0000	3.97E-07
232	0.00	0.000	0.019	0.2777	0.4284	0.0000	3.97E-07
233	0.15	0.000	0.036	0.2893	0.4283	0.0000	3.97E-07
234	0.26	0.085	0.093	0.2975	0.4281	0.0000	3.97E-07
235	0.00	0.000	0.081	0.2895	0.4280	0.0000	3.97E-07
236	0.82	0.523	0.163	0.3032	0.4279	0.0000	3.97E-07
237	0.00	0.000	0.150	0.2882	0.4278	0.0000	3.97E-07
238	0.00	0.000	0.087	0.2795	0.4276	0.0000	3.97E-07
239	0.00	0.000	0.019	0.2776	0.4275	0.0000	3.97E-07
240	0.00	0.000	0.005	0.2772	0.4274	0.0000	3.97E-07
241	0.00	0.000	0.001	0.2770	0.4273	0.0000	3.96E-07
242	0.07	0.000	0.028	0.2809	0.4271	0.0000	3.96E-07
243	0.00	0.000	0.005	0.2804	0.4270	0.0000	3.96E-07
244	0.00	0.000	0.014	0.2790	0.4269	0.0000	3.96E-07
245	0.00	0.000	0.009	0.2782	0.4268	0.0000	3.96E-07
246	0.00	0.000	0.008	0.2774	0.4266	0.0000	3.96E-07
247	0.00	0.000	0.003	0.2771	0.4265	0.0000	3.96E-07
248	0.68	0.473	0.050	0.2929	0.4264	0.0000	3.96E-07

249		0.00	0.000	0.013	0.2916	0.4263	0.0000	3.96E-07
250		0.00	0.000	0.018	0.2898	0.4261	0.0000	3.95E-07
251		0.02	0.000	0.033	0.2885	0.4260	0.0000	3.95E-07
252		0.00	0.000	0.021	0.2863	0.4259	0.0000	3.95E-07
253		0.61	0.421	0.045	0.3006	0.4258	0.0000	3.95E-07
254		0.01	0.000	0.103	0.2912	0.4256	0.0000	3.95E-07
255		0.00	0.000	0.016	0.2896	0.4255	0.0000	3.95E-07
256		0.25	0.089	0.038	0.3017	0.4254	0.0000	3.95E-07
257		3.71	3.512	0.081	0.3131	0.4253	0.0000	3.95E-07
258		0.00	0.000	0.135	0.2996	0.4251	0.0000	3.95E-07
259		0.00	0.000	0.125	0.2871	0.4250	0.0000	3.95E-07
260		0.00	0.000	0.088	0.2783	0.4249	0.0000	3.94E-07
261		0.00	0.000	0.013	0.2773	0.4248	0.0000	3.94E-07
262		0.58	0.334	0.095	0.2924	0.4246	0.0000	3.94E-07
263		0.02	0.000	0.057	0.2892	0.4245	0.0000	3.94E-07
264		0.00	0.000	0.049	0.2843	0.4244	0.0000	3.94E-07
265		0.00	0.000	0.040	0.2803	0.4243	0.0000	3.94E-07
266		0.00	0.000	0.018	0.2784	0.4242	0.0000	3.94E-07
267		0.12	0.000	0.046	0.2857	0.4240	0.0000	3.94E-07
268		0.00	0.000	0.055	0.2802	0.4239	0.0000	3.94E-07
269		0.00	0.000	0.023	0.2779	0.4238	0.0000	3.93E-07
270		0.00	0.000	0.007	0.2772	0.4237	0.0000	3.93E-07
271		0.00	0.000	0.002	0.2771	0.4235	0.0000	3.93E-07
272		0.00	0.000	0.000	0.2770	0.4234	0.0000	3.93E-07
273		0.00	0.000	0.000	0.2770	0.4233	0.0000	3.93E-07
274	*	0.00	0.000	0.000	0.2770	0.4232	0.0000	3.93E-07
275		0.17	0.006	0.035	0.2895	0.4230	0.0000	3.93E-07
276		0.00	0.000	0.011	0.2884	0.4229	0.0000	3.93E-07
277		0.00	0.000	0.017	0.2868	0.4228	0.0000	3.93E-07
278		0.00	0.000	0.017	0.2851	0.4227	0.0000	3.93E-07
279		0.00	0.000	0.015	0.2836	0.4225	0.0000	3.92E-07
280		0.00	0.000	0.014	0.2821	0.4224	0.0000	3.92E-07

281		0.46	0.262	0.043	0.2976	0.4223	0.0000	3.92E-07
282		0.03	0.000	0.029	0.2974	0.4222	0.0000	3.92E-07
283		0.01	0.000	0.022	0.2961	0.4220	0.0000	3.92E-07
284		0.14	0.000	0.036	0.3067	0.4219	0.0000	3.92E-07
285		0.69	0.394	0.196	0.3166	0.4218	0.0000	3.92E-07
286		0.00	0.000	0.100	0.3066	0.4217	0.0000	3.92E-07
287		0.00	0.000	0.084	0.2982	0.4216	0.0000	3.92E-07
288		0.00	0.000	0.107	0.2875	0.4214	0.0000	3.91E-07
289		0.00	0.000	0.045	0.2830	0.4213	0.0000	3.91E-07
290		0.00	0.000	0.038	0.2792	0.4212	0.0000	3.91E-07
291		0.00	0.000	0.020	0.2772	0.4211	0.0000	3.91E-07
292		0.00	0.000	0.002	0.2770	0.4209	0.0000	3.91E-07
293		0.04	0.000	0.023	0.2792	0.4208	0.0000	3.91E-07
294		0.10	0.000	0.026	0.2863	0.4207	0.0000	3.91E-07
295		0.00	0.000	0.010	0.2853	0.4206	0.0000	3.91E-07
296		0.85	0.659	0.046	0.2995	0.4204	0.0000	3.91E-07
297		0.00	0.000	0.030	0.2965	0.4203	0.0000	3.91E-07
298		0.00	0.000	0.054	0.2911	0.4202	0.0000	3.90E-07
299		0.00	0.000	0.040	0.2871	0.4201	0.0000	3.90E-07
300	*	0.05	0.000	0.053	0.2871	0.4200	0.0000	3.90E-07
301		0.04	0.000	0.072	0.2841	0.4198	0.0000	3.90E-07
302		0.98	0.764	0.078	0.2976	0.4197	0.0000	3.90E-07
303		2.94	2.686	0.142	0.3092	0.4196	0.0000	3.90E-07
304		0.00	0.000	0.084	0.3008	0.4195	0.0000	3.90E-07
305		0.00	0.000	0.079	0.2929	0.4193	0.0000	3.90E-07
306		0.00	0.000	0.066	0.2863	0.4192	0.0000	3.90E-07
307		0.00	0.000	0.069	0.2794	0.4191	0.0000	3.89E-07
308		0.00	0.000	0.018	0.2776	0.4190	0.0000	3.89E-07
309		0.00	0.000	0.005	0.2772	0.4189	0.0000	3.89E-07
310		0.00	0.000	0.001	0.2770	0.4187	0.0000	3.89E-07
311		0.00	0.000	0.000	0.2770	0.4186	0.0000	3.89E-07
312		0.16	0.000	0.037	0.2892	0.4185	0.0000	3.89E-07

313		0.00	0.000	0.012	0.2880	0.4184	0.0000	3.89E-07
314		0.00	0.000	0.016	0.2864	0.4182	0.0000	3.89E-07
315		0.00	0.000	0.016	0.2848	0.4181	0.0000	3.89E-07
316		0.00	0.000	0.016	0.2832	0.4180	0.0000	3.89E-07
317		0.00	0.000	0.015	0.2817	0.4179	0.0000	3.88E-07
318		0.00	0.000	0.014	0.2803	0.4178	0.0000	3.88E-07
319		0.00	0.000	0.014	0.2789	0.4176	0.0000	3.88E-07
320		0.28	0.121	0.037	0.2910	0.4175	0.0000	3.88E-07
321		0.55	0.394	0.041	0.3027	0.4174	0.0000	3.88E-07
322		0.00	0.000	0.038	0.2989	0.4173	0.0000	3.88E-07
323		0.00	0.000	0.072	0.2917	0.4171	0.0000	3.88E-07
324		0.14	0.000	0.081	0.2971	0.4170	0.0000	3.88E-07
325		0.35	0.125	0.125	0.3070	0.4169	0.0000	3.88E-07
326		0.33	0.148	0.099	0.3154	0.4168	0.0000	3.88E-07
327		0.06	0.000	0.070	0.3142	0.4167	0.0000	3.87E-07
328		0.00	0.000	0.049	0.3094	0.4165	0.0000	3.87E-07
329		0.00	0.000	0.031	0.3062	0.4164	0.0000	3.87E-07
330	*	0.00	0.000	0.000	0.3062	0.4163	0.0000	3.87E-07
331	*	0.05	0.000	0.038	0.3077	0.4162	0.0000	3.87E-07
332	*	0.00	0.000	0.027	0.3050	0.4160	0.0000	3.87E-07
333		0.00	0.000	0.036	0.3014	0.4159	0.0000	3.87E-07
334	*	0.00	0.000	0.000	0.3014	0.4158	0.0000	3.87E-07
335		0.00	0.000	0.040	0.2976	0.4157	0.0000	3.87E-07
336		0.00	0.000	0.042	0.2934	0.4156	0.0000	3.86E-07
337		0.00	0.000	0.063	0.2871	0.4154	0.0000	3.86E-07
338		0.00	0.000	0.028	0.2843	0.4153	0.0000	3.86E-07
339	*	0.01	0.000	0.008	0.2843	0.4152	0.0000	3.86E-07
340	*	1.08	0.000	0.033	0.2863	0.4151	0.0000	3.86E-07
341		0.00	0.040	0.027	0.2995	0.4150	0.0000	3.86E-07
342		0.00	0.716	0.000	0.3111	0.4148	0.0000	3.86E-07
343		0.00	0.000	0.054	0.3057	0.4147	0.0000	3.86E-07
344		0.22	0.062	0.078	0.3143	0.4146	0.0000	3.86E-07

345		0.49	0.291	0.082	0.3259	0.4145	0.0000	3.86E-07
346		0.00	0.000	0.054	0.3205	0.4143	0.0000	3.85E-07
347	*	0.00	0.000	0.026	0.3179	0.4142	0.0000	3.85E-07
348	*	0.00	0.000	0.024	0.3155	0.4141	0.0000	3.85E-07
349		0.00	0.000	0.041	0.3114	0.4140	0.0000	3.85E-07
350		0.00	0.000	0.040	0.3075	0.4139	0.0000	3.85E-07
351		0.00	0.000	0.031	0.3048	0.4137	0.0000	3.85E-07
352	*	0.27	0.000	0.024	0.3068	0.4136	0.0000	3.85E-07
353	*	0.00	0.000	0.041	0.3088	0.4135	0.0000	3.85E-07
354		0.00	0.001	0.087	0.3169	0.4134	0.0000	3.85E-07
355	*	0.00	0.000	0.027	0.3142	0.4133	0.0000	3.85E-07
356		0.00	0.000	0.034	0.3108	0.4131	0.0000	3.84E-07
357		0.00	0.000	0.029	0.3079	0.4130	0.0000	3.84E-07
358		0.00	0.000	0.044	0.3035	0.4129	0.0000	3.84E-07
359	*	0.00	0.000	0.027	0.3008	0.4128	0.0000	3.84E-07
360	*	0.00	0.000	0.023	0.2985	0.4127	0.0000	3.84E-07
361		0.00	0.000	0.050	0.2935	0.4125	0.0000	3.84E-07
362	*	0.00	0.000	0.024	0.2912	0.4124	0.0000	3.84E-07
363	*	0.00	0.000	0.000	0.2912	0.4123	0.0000	3.84E-07
364	*	0.00	0.000	0.021	0.2890	0.4122	0.0000	3.84E-07
365	*	0.00	0.000	0.000	0.2890	0.4120	0.0000	3.83E-07

* = Frozen (air or soil)

Annual Totals for Year 15			
	inches	cubic feet	percent
Precipitation	37.97	137,843.5	100.00
Runoff	23.126	83,946.4	60.90
Evapotranspiration	15.032	54,566.6	39.59
Recirculation into Layer 1	0.0180	65.3	0.05
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0180	65.3	0.05
Percolation/Leakage through Layer 5	0.000147	0.5335	0.00
Average Head on Top of Layer 4	0.4347	---	---
Change in Water Storage	-0.1846	-670.0	-0.49
Soil Water at Start of Year	1,406.9032	5,107,058.5	3704.97
Soil Water at End of Year	1,406.7186	5,106,388.6	3704.48
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0180	-65.3	-0.05

Daily Output for Year 16

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.000	0.2890	0.4119	0.0000	3.83E-07
2	*		0.00	0.000	0.000	0.2890	0.4118	0.0000	3.83E-07
3	*		0.00	0.000	0.000	0.2891	0.4117	0.0000	3.83E-07
4	*		0.00	0.000	0.000	0.2891	0.4116	0.0000	3.83E-07
5	*	*	0.00	0.000	0.000	0.2891	0.4114	0.0000	3.83E-07
6	*	*	0.00	0.000	0.000	0.2891	0.4113	0.0000	3.83E-07
7	*	*	0.00	0.000	0.000	0.2891	0.4112	0.0000	3.83E-07
8		*	0.04	0.000	0.019	0.2913	0.4111	0.0000	3.83E-07
9		*	0.00	0.000	0.000	0.2913	0.4110	0.0000	3.83E-07
10	*	*	0.00	0.000	0.000	0.2913	0.4108	0.0000	3.82E-07
11	*	*	0.00	0.000	0.000	0.2913	0.4107	0.0000	3.82E-07
12		*	0.00	0.000	0.000	0.2913	0.4106	0.0000	3.82E-07
13	*	*	0.00	0.000	0.000	0.2913	0.4105	0.0000	3.82E-07
14	*	*	0.00	0.000	0.000	0.2913	0.4104	0.0000	3.82E-07
15	*	*	0.00	0.000	0.000	0.2913	0.4102	0.0000	3.82E-07
16	*	*	0.00	0.000	0.000	0.2913	0.4101	0.0000	3.82E-07
17		*	0.00	0.000	0.000	0.2913	0.4100	0.0000	3.82E-07
18		*	0.39	0.342	0.023	0.2938	0.4099	0.0000	3.82E-07
19			0.00	0.000	0.050	0.2888	0.4098	0.0000	3.82E-07
20			0.00	0.000	0.063	0.2825	0.4096	0.0000	3.81E-07
21			0.00	0.000	0.043	0.2782	0.4095	0.0000	3.81E-07
22			0.00	0.000	0.009	0.2773	0.4094	0.0000	3.81E-07
23			0.16	0.000	0.043	0.2888	0.4093	0.0000	3.81E-07
24			1.13	0.877	0.135	0.3010	0.4092	0.0000	3.81E-07

25		0.00	0.000	0.051	0.2959	0.4090	0.0000	3.81E-07
26		0.00	0.000	0.040	0.2919	0.4089	0.0000	3.81E-07
27		0.00	0.000	0.045	0.2874	0.4088	0.0000	3.81E-07
28		0.00	0.000	0.071	0.2803	0.4087	0.0000	3.81E-07
29		0.00	0.000	0.028	0.2775	0.4086	0.0000	3.81E-07
30		0.00	0.000	0.004	0.2771	0.4084	0.0000	3.80E-07
31		0.00	0.000	0.001	0.2770	0.4083	0.0000	3.80E-07
32		0.00	0.000	0.000	0.2770	0.4082	0.0000	3.80E-07
33		0.00	0.000	0.000	0.2770	0.4081	0.0000	3.80E-07
34	*	0.00	0.000	0.000	0.2770	0.4080	0.0000	3.80E-07
35		0.00	0.000	0.000	0.2770	0.4079	0.0000	3.80E-07
36		0.00	0.000	0.000	0.2770	0.4077	0.0000	3.80E-07
37		0.06	0.000	0.023	0.2805	0.4076	0.0000	3.80E-07
38		0.02	0.000	0.016	0.2810	0.4075	0.0000	3.80E-07
39		0.00	0.000	0.009	0.2800	0.4074	0.0000	3.80E-07
40		0.04	0.000	0.028	0.2812	0.4073	0.0000	3.79E-07
41		0.06	0.000	0.029	0.2838	0.4071	0.0000	3.79E-07
42	*	0.30	0.000	0.027	0.2858	0.4070	0.0000	3.79E-07
43		0.00	0.064	0.061	0.2985	0.4069	0.0000	3.79E-07
44		0.00	0.000	0.008	0.2977	0.4068	0.0000	3.79E-07
45		0.02	0.000	0.026	0.2972	0.4067	0.0000	3.79E-07
46		0.27	0.107	0.041	0.3097	0.4065	0.0000	3.79E-07
47		0.02	0.000	0.069	0.3052	0.4064	0.0000	3.79E-07
48		0.02	0.000	0.052	0.3015	0.4063	0.0000	3.79E-07
49		0.00	0.000	0.052	0.2964	0.4062	0.0000	3.79E-07
50		0.09	0.000	0.067	0.2983	0.4061	0.0000	3.78E-07
51		0.00	0.000	0.037	0.2946	0.4059	0.0000	3.78E-07
52		0.00	0.000	0.031	0.2915	0.4058	0.0000	3.78E-07
53		0.00	0.000	0.024	0.2891	0.4057	0.0000	3.78E-07
54		0.09	0.000	0.043	0.2935	0.4056	0.0000	3.78E-07
55	*	0.00	0.000	0.000	0.2935	0.4055	0.0000	3.78E-07
56		0.00	0.000	0.022	0.2913	0.4054	0.0000	3.78E-07

57	0.00	0.000	0.018	0.2895	0.4052	0.0000	3.78E-07
58	0.00	0.000	0.016	0.2879	0.4051	0.0000	3.78E-07
59	0.00	0.000	0.014	0.2865	0.4050	0.0000	3.77E-07
60	0.00	0.000	0.014	0.2851	0.4049	0.0000	3.77E-07
61	0.00	0.000	0.013	0.2838	0.4048	0.0000	3.77E-07
62	0.00	0.000	0.015	0.2826	0.4046	0.0000	3.77E-07
63	0.11	0.000	0.035	0.2903	0.4045	0.0000	3.77E-07
64	0.00	0.000	0.014	0.2889	0.4044	0.0000	3.77E-07
65	0.00	0.000	0.014	0.2875	0.4043	0.0000	3.77E-07
66	0.00	0.000	0.014	0.2861	0.4042	0.0000	3.77E-07
67	0.00	0.000	0.011	0.2850	0.4041	0.0000	3.77E-07
68	0.00	0.000	0.011	0.2840	0.4039	0.0000	3.77E-07
69	0.00	0.000	0.010	0.2830	0.4038	0.0000	3.76E-07
70	0.00	0.000	0.010	0.2820	0.4037	0.0000	3.76E-07
71	0.00	0.000	0.010	0.2810	0.4036	0.0000	3.76E-07
72	0.00	0.000	0.009	0.2801	0.4035	0.0000	3.76E-07
73	0.08	0.000	0.032	0.2850	0.4033	0.0000	3.76E-07
74	0.05	0.000	0.031	0.2868	0.4032	0.0000	3.76E-07
75	0.01	0.000	0.019	0.2858	0.4031	0.0000	3.76E-07
76	0.57	0.398	0.036	0.2994	0.4030	0.0000	3.76E-07
77	0.00	0.000	0.042	0.2951	0.4029	0.0000	3.76E-07
78	0.00	0.000	0.010	0.2942	0.4028	0.0000	3.76E-07
79	0.15	0.000	0.032	0.3058	0.4026	0.0000	3.75E-07
80	0.04	0.000	0.066	0.3035	0.4025	0.0000	3.75E-07
81	0.92	0.674	0.112	0.3163	0.4024	0.0000	3.75E-07
82	0.39	0.190	0.139	0.3221	0.4023	0.0000	3.75E-07
83	0.00	0.000	0.077	0.3144	0.4022	0.0000	3.75E-07
84	0.00	0.000	0.197	0.2948	0.4020	0.0000	3.75E-07
85	0.00	0.000	0.142	0.2806	0.4019	0.0000	3.75E-07
86	0.10	0.000	0.061	0.2842	0.4018	0.0000	3.75E-07
87	0.00	0.000	0.027	0.2816	0.4017	0.0000	3.75E-07
88	0.00	0.000	0.026	0.2790	0.4016	0.0000	3.75E-07

89		0.00	0.000	0.009	0.2781	0.4015	0.0000	3.74E-07
90		0.00	0.000	0.006	0.2775	0.4013	0.0000	3.74E-07
91		0.00	0.000	0.004	0.2771	0.4012	0.0000	3.74E-07
92		0.00	0.000	0.001	0.2770	0.4011	0.0000	3.74E-07
93		0.00	0.000	0.000	0.2770	0.4010	0.0000	3.74E-07
94		0.28	0.119	0.033	0.2896	0.4009	0.0000	3.74E-07
95		1.33	1.169	0.044	0.3012	0.4008	0.0000	3.74E-07
96		0.00	0.000	0.089	0.2923	0.4006	0.0000	3.74E-07
97		0.00	0.000	0.125	0.2799	0.4005	0.0000	3.74E-07
98		0.00	0.000	0.022	0.2776	0.4004	0.0000	3.74E-07
99		0.00	0.000	0.005	0.2772	0.4003	0.0000	3.73E-07
100		0.00	0.000	0.001	0.2770	0.4002	0.0000	3.73E-07
101	*	0.00	0.000	0.000	0.2770	0.4001	0.0000	3.73E-07
102		0.00	0.000	0.000	0.2770	0.3999	0.0000	3.73E-07
103	*	0.00	0.000	0.000	0.2770	0.3998	0.0000	3.73E-07
104		0.00	0.000	0.000	0.2770	0.3997	0.0000	3.73E-07
105	*	0.00	0.000	0.000	0.2770	0.3996	0.0000	3.73E-07
106	*	0.17	0.000	0.112	0.2790	0.3995	0.0000	3.73E-07
107	*	0.00	0.000	0.000	0.2809	0.3994	0.0000	3.73E-07
108		1.01	0.832	0.067	0.2936	0.3992	0.0000	3.73E-07
109		0.06	0.000	0.064	0.2935	0.3991	0.0000	3.72E-07
110	*	1.92	0.000	0.000	0.2955	0.3990	0.0000	3.72E-07
111		0.00	1.768	0.000	0.3082	0.3989	0.0000	3.72E-07
112		0.00	0.000	0.082	0.3000	0.3988	0.0000	3.72E-07
113		0.00	0.000	0.138	0.2862	0.3987	0.0000	3.72E-07
114		0.24	0.085	0.081	0.2938	0.3985	0.0000	3.72E-07
115		0.00	0.000	0.065	0.2873	0.3984	0.0000	3.72E-07
116		0.00	0.000	0.075	0.2798	0.3983	0.0000	3.72E-07
117		0.00	0.000	0.023	0.2774	0.3982	0.0000	3.72E-07
118		0.90	0.583	0.154	0.2934	0.3981	0.0000	3.72E-07
119		0.41	0.140	0.243	0.2961	0.3980	0.0000	3.71E-07
120		0.68	0.362	0.199	0.3076	0.3978	0.0000	3.71E-07

121		0.01	0.000	0.093	0.2989	0.3977	0.0000	3.71E-07
122	*	0.01	0.000	0.071	0.2927	0.3976	0.0000	3.71E-07
123	*	0.21	0.000	0.084	0.2946	0.3975	0.0000	3.71E-07
124		0.93	0.892	0.000	0.3089	0.3974	0.0000	3.71E-07
125		0.05	0.000	0.100	0.3040	0.3973	0.0000	3.71E-07
126		0.26	0.083	0.198	0.3019	0.3971	0.0000	3.71E-07
127		0.54	0.317	0.110	0.3134	0.3970	0.0000	3.71E-07
128		0.59	0.344	0.127	0.3250	0.3969	0.0000	3.71E-07
129		0.18	0.024	0.243	0.3165	0.3968	0.0000	3.70E-07
130		0.00	0.000	0.180	0.2985	0.3967	0.0000	3.70E-07
131		0.00	0.000	0.179	0.2806	0.3966	0.0000	3.70E-07
132		0.00	0.000	0.030	0.2776	0.3964	0.0000	3.70E-07
133		0.11	0.000	0.033	0.2851	0.3965	0.0000	3.70E-07
134		0.00	0.000	0.023	0.2831	0.3963	0.0000	3.70E-07
135		0.00	0.000	0.022	0.2810	0.3962	0.0000	3.70E-07
136		0.00	0.000	0.021	0.2788	0.3961	0.0000	3.70E-07
137		0.43	0.223	0.052	0.2941	0.3960	0.0000	3.70E-07
138		0.79	0.417	0.260	0.3055	0.3959	0.0000	3.70E-07
139		0.00	0.000	0.072	0.2983	0.3958	0.0000	3.70E-07
140		0.00	0.000	0.105	0.2878	0.3957	0.0000	3.70E-07
141		0.00	0.000	0.066	0.2812	0.3955	0.0000	3.69E-07
142		0.03	0.000	0.056	0.2788	0.3954	0.0000	3.69E-07
143		1.10	0.884	0.068	0.2939	0.3953	0.0000	3.69E-07
144		0.08	0.000	0.111	0.2912	0.3952	0.0000	3.69E-07
145		0.00	0.000	0.080	0.2833	0.3951	0.0000	3.69E-07
146		0.00	0.000	0.055	0.2778	0.3950	0.0000	3.69E-07
147		0.00	0.000	0.006	0.2771	0.3948	0.0000	3.69E-07
148		0.01	0.000	0.014	0.2770	0.3947	0.0000	3.69E-07
149		2.13	1.899	0.067	0.2931	0.3946	0.0000	3.69E-07
150		0.09	0.000	0.168	0.2856	0.3945	0.0000	3.69E-07
151		0.02	0.000	0.086	0.2795	0.3944	0.0000	3.68E-07
152		0.04	0.000	0.049	0.2789	0.3943	0.0000	3.68E-07

153	0.00	0.000	0.010	0.2779	0.3942	0.0000	3.68E-07
154	0.00	0.000	0.007	0.2772	0.3940	0.0000	3.68E-07
155	0.00	0.000	0.002	0.2771	0.3939	0.0000	3.68E-07
156	0.00	0.000	0.000	0.2770	0.3938	0.0000	3.68E-07
157	0.00	0.000	0.000	0.2770	0.3937	0.0000	3.68E-07
158	0.00	0.000	0.000	0.2770	0.3936	0.0000	3.68E-07
159	0.00	0.000	0.000	0.2770	0.3935	0.0000	3.68E-07
160	0.00	0.000	0.000	0.2770	0.3933	0.0000	3.68E-07
161	0.00	0.000	0.000	0.2770	0.3932	0.0000	3.67E-07
162	0.00	0.000	0.000	0.2770	0.3931	0.0000	3.67E-07
163	0.00	0.000	0.000	0.2770	0.3930	0.0000	3.67E-07
164	0.00	0.000	0.000	0.2770	0.3929	0.0000	3.67E-07
165	0.00	0.000	0.000	0.2770	0.3928	0.0000	3.67E-07
166	0.13	0.000	0.025	0.2877	0.3927	0.0000	3.67E-07
167	0.43	0.260	0.042	0.3006	0.3925	0.0000	3.67E-07
168	0.01	0.000	0.014	0.2998	0.3924	0.0000	3.67E-07
169	0.06	0.000	0.034	0.3027	0.3923	0.0000	3.67E-07
170	0.01	0.000	0.025	0.3015	0.3922	0.0000	3.67E-07
171	0.11	0.000	0.037	0.3086	0.3921	0.0000	3.66E-07
172	0.18	0.021	0.038	0.3206	0.3920	0.0000	3.66E-07
173	0.00	0.000	0.014	0.3193	0.3919	0.0000	3.66E-07
174	0.76	0.595	0.040	0.3323	0.3917	0.0000	3.66E-07
175	0.00	0.000	0.156	0.3167	0.3916	0.0000	3.66E-07
176	0.00	0.000	0.016	0.3151	0.3915	0.0000	3.66E-07
177	0.00	0.000	0.016	0.3135	0.3914	0.0000	3.66E-07
178	0.69	0.504	0.040	0.3279	0.3913	0.0000	3.66E-07
179	0.00	0.000	0.192	0.3087	0.3912	0.0000	3.66E-07
180	0.13	0.000	0.129	0.3091	0.3911	0.0000	3.66E-07
181	0.00	0.000	0.105	0.2986	0.3909	0.0000	3.66E-07
182	0.00	0.000	0.124	0.2862	0.3908	0.0000	3.65E-07
183	0.36	0.154	0.084	0.2988	0.3907	0.0000	3.65E-07
184	0.19	0.037	0.109	0.3027	0.3906	0.0000	3.65E-07

185	0.23	0.084	0.107	0.3069	0.3905	0.0000	3.65E-07
186	0.34	0.133	0.238	0.3034	0.3904	0.0000	3.65E-07
187	0.00	0.000	0.184	0.2850	0.3903	0.0000	3.65E-07
188	0.00	0.000	0.062	0.2788	0.3901	0.0000	3.65E-07
189	0.79	0.547	0.089	0.2941	0.3900	0.0000	3.65E-07
190	0.20	0.046	0.079	0.3012	0.3899	0.0000	3.65E-07
191	0.42	0.187	0.140	0.3101	0.3898	0.0000	3.65E-07
192	0.07	0.000	0.211	0.2965	0.3897	0.0000	3.64E-07
193	0.00	0.000	0.114	0.2851	0.3896	0.0000	3.64E-07
194	0.00	0.000	0.060	0.2792	0.3895	0.0000	3.64E-07
195	0.72	0.482	0.082	0.2951	0.3893	0.0000	3.64E-07
196	0.12	0.000	0.081	0.2992	0.3892	0.0000	3.64E-07
197	0.86	0.617	0.120	0.3118	0.3891	0.0000	3.64E-07
198	0.04	0.000	0.085	0.3078	0.3890	0.0000	3.64E-07
199	0.00	0.000	0.209	0.2870	0.3889	0.0000	3.64E-07
200	0.00	0.000	0.072	0.2798	0.3888	0.0000	3.64E-07
201	0.00	0.000	0.021	0.2777	0.3887	0.0000	3.64E-07
202	0.00	0.000	0.005	0.2772	0.3885	0.0000	3.63E-07
203	0.00	0.000	0.002	0.2770	0.3884	0.0000	3.63E-07
204	0.00	0.000	0.000	0.2770	0.3883	0.0000	3.63E-07
205	0.00	0.000	0.000	0.2770	0.3882	0.0000	3.63E-07
206	0.00	0.000	0.000	0.2770	0.3881	0.0000	3.63E-07
207	0.00	0.000	0.004	0.2770	0.3880	0.0000	3.63E-07
208	0.24	0.080	0.038	0.2893	0.3879	0.0000	3.63E-07
209	0.20	0.061	0.035	0.3001	0.3878	0.0000	3.63E-07
210	0.04	0.000	0.031	0.3005	0.3876	0.0000	3.63E-07
211	0.20	0.045	0.045	0.3118	0.3875	0.0000	3.63E-07
212	0.00	0.000	0.021	0.3097	0.3874	0.0000	3.62E-07
213	0.00	0.000	0.021	0.3076	0.3873	0.0000	3.62E-07
214	0.12	0.000	0.043	0.3148	0.3872	0.0000	3.62E-07
215	0.00	0.000	0.182	0.2966	0.3871	0.0000	3.62E-07
216	0.68	0.481	0.051	0.3113	0.3870	0.0000	3.62E-07

217	0.14	0.003	0.129	0.3125	0.3868	0.0000	3.62E-07
218	0.72	0.480	0.113	0.3247	0.3867	0.0000	3.62E-07
219	0.00	0.000	0.223	0.3024	0.3866	0.0000	3.62E-07
220	0.00	0.000	0.223	0.2801	0.3865	0.0000	3.62E-07
221	0.02	0.000	0.047	0.2776	0.3864	0.0000	3.62E-07
222	0.01	0.000	0.013	0.2772	0.3863	0.0000	3.62E-07
223	0.00	0.000	0.002	0.2770	0.3862	0.0000	3.61E-07
224	0.08	0.000	0.027	0.2827	0.3861	0.0000	3.61E-07
225	0.07	0.000	0.040	0.2852	0.3859	0.0000	3.61E-07
226	0.08	0.000	0.047	0.2885	0.3858	0.0000	3.61E-07
227	0.01	0.000	0.029	0.2870	0.3857	0.0000	3.61E-07
228	0.00	0.000	0.025	0.2845	0.3856	0.0000	3.61E-07
229	0.30	0.109	0.053	0.2982	0.3855	0.0000	3.61E-07
230	0.00	0.000	0.018	0.2965	0.3854	0.0000	3.61E-07
231	0.00	0.000	0.017	0.2947	0.3853	0.0000	3.61E-07
232	0.00	0.000	0.018	0.2929	0.3852	0.0000	3.61E-07
233	0.00	0.000	0.018	0.2912	0.3850	0.0000	3.60E-07
234	0.00	0.000	0.016	0.2896	0.3849	0.0000	3.60E-07
235	0.04	0.000	0.035	0.2902	0.3848	0.0000	3.60E-07
236	0.00	0.000	0.015	0.2887	0.3847	0.0000	3.60E-07
237	0.52	0.338	0.050	0.3017	0.3846	0.0000	3.60E-07
238	1.44	0.999	0.411	0.3050	0.3845	0.0000	3.60E-07
239	0.00	0.000	0.202	0.2848	0.3844	0.0000	3.60E-07
240	0.00	0.000	0.067	0.2781	0.3843	0.0000	3.60E-07
241	0.00	0.000	0.010	0.2772	0.3841	0.0000	3.60E-07
242	0.00	0.000	0.001	0.2770	0.3840	0.0000	3.60E-07
243	0.00	0.000	0.000	0.2770	0.3839	0.0000	3.60E-07
244	0.00	0.000	0.000	0.2770	0.3838	0.0000	3.59E-07
245	0.34	0.158	0.054	0.2903	0.3837	0.0000	3.59E-07
246	0.00	0.000	0.013	0.2890	0.3836	0.0000	3.59E-07
247	0.00	0.000	0.017	0.2873	0.3835	0.0000	3.59E-07
248	0.00	0.000	0.016	0.2857	0.3834	0.0000	3.59E-07

249	0.00	0.000	0.015	0.2842	0.3832	0.0000	3.59E-07
250	0.09	0.000	0.038	0.2896	0.3831	0.0000	3.59E-07
251	0.03	0.000	0.035	0.2893	0.3830	0.0000	3.59E-07
252	0.11	0.000	0.036	0.2962	0.3829	0.0000	3.59E-07
253	0.00	0.000	0.009	0.2954	0.3828	0.0000	3.59E-07
254	0.00	0.000	0.013	0.2941	0.3827	0.0000	3.58E-07
255	0.12	0.000	0.036	0.3023	0.3826	0.0000	3.58E-07
256	0.50	0.326	0.041	0.3154	0.3825	0.0000	3.58E-07
257	1.78	1.511	0.150	0.3270	0.3824	0.0000	3.58E-07
258	0.00	0.000	0.089	0.3181	0.3822	0.0000	3.58E-07
259	0.00	0.000	0.167	0.3013	0.3821	0.0000	3.58E-07
260	0.00	0.000	0.210	0.2803	0.3820	0.0000	3.58E-07
261	0.00	0.000	0.025	0.2778	0.3819	0.0000	3.58E-07
262	0.00	0.000	0.006	0.2772	0.3818	0.0000	3.58E-07
263	0.00	0.000	0.004	0.2770	0.3817	0.0000	3.58E-07
264	0.10	0.000	0.027	0.2844	0.3816	0.0000	3.58E-07
265	0.00	0.000	0.014	0.2831	0.3815	0.0000	3.57E-07
266	0.00	0.000	0.015	0.2817	0.3814	0.0000	3.57E-07
267	0.00	0.000	0.017	0.2800	0.3813	0.0000	3.57E-07
268	0.00	0.000	0.016	0.2784	0.3811	0.0000	3.57E-07
269	0.00	0.000	0.006	0.2778	0.3810	0.0000	3.57E-07
270	0.00	0.000	0.004	0.2774	0.3809	0.0000	3.57E-07
271	0.00	0.000	0.003	0.2771	0.3808	0.0000	3.57E-07
272	0.12	0.000	0.027	0.2863	0.3807	0.0000	3.57E-07
273	0.38	0.204	0.043	0.2996	0.3806	0.0000	3.57E-07
274	0.10	0.000	0.032	0.3063	0.3805	0.0000	3.57E-07
275	0.00	0.000	0.012	0.3051	0.3804	0.0000	3.56E-07
276	0.00	0.000	0.011	0.3040	0.3803	0.0000	3.56E-07
277	0.00	0.000	0.011	0.3029	0.3801	0.0000	3.56E-07
278	0.00	0.000	0.011	0.3019	0.3800	0.0000	3.56E-07
279	0.03	0.000	0.027	0.3020	0.3799	0.0000	3.56E-07
280	0.00	0.000	0.010	0.3010	0.3798	0.0000	3.56E-07

281	0.00	0.000	0.012	0.2998	0.3797	0.0000	3.56E-07
282	0.00	0.000	0.011	0.2987	0.3796	0.0000	3.56E-07
283	1.08	0.896	0.039	0.3130	0.3795	0.0000	3.56E-07
284	0.00	0.000	0.053	0.3078	0.3794	0.0000	3.56E-07
285	1.20	0.957	0.107	0.3213	0.3793	0.0000	3.56E-07
286	0.16	0.016	0.137	0.3224	0.3792	0.0000	3.55E-07
287	0.00	0.000	0.050	0.3174	0.3791	0.0000	3.55E-07
288	0.00	0.000	0.127	0.3047	0.3790	0.0000	3.55E-07
289	0.00	0.000	0.101	0.2946	0.3788	0.0000	3.55E-07
290	0.02	0.000	0.090	0.2881	0.3787	0.0000	3.55E-07
291	0.80	0.446	0.207	0.3026	0.3786	0.0000	3.55E-07
292	0.00	0.000	0.141	0.2885	0.3785	0.0000	3.55E-07
293	0.02	0.000	0.078	0.2828	0.3784	0.0000	3.55E-07
294	0.00	0.000	0.051	0.2778	0.3783	0.0000	3.55E-07
295	0.00	0.000	0.006	0.2772	0.3782	0.0000	3.55E-07
296	0.00	0.000	0.001	0.2770	0.3781	0.0000	3.54E-07
297	0.44	0.229	0.067	0.2912	0.3780	0.0000	3.54E-07
298	0.06	0.000	0.058	0.2913	0.3778	0.0000	3.54E-07
299	0.00	0.000	0.068	0.2845	0.3777	0.0000	3.54E-07
300	0.00	0.000	0.063	0.2783	0.3776	0.0000	3.54E-07
301	0.00	0.000	0.010	0.2773	0.3775	0.0000	3.54E-07
302	0.00	0.000	0.002	0.2771	0.3774	0.0000	3.54E-07
303	0.00	0.000	0.001	0.2770	0.3773	0.0000	3.54E-07
304	0.81	0.587	0.056	0.2933	0.3772	0.0000	3.54E-07
305	0.00	0.000	0.026	0.2906	0.3771	0.0000	3.54E-07
306	0.08	0.000	0.054	0.2935	0.3770	0.0000	3.54E-07
307	0.00	0.000	0.041	0.2894	0.3769	0.0000	3.53E-07
308	0.00	0.000	0.033	0.2861	0.3767	0.0000	3.53E-07
309	0.00	0.000	0.038	0.2823	0.3766	0.0000	3.53E-07
310	0.00	0.000	0.027	0.2797	0.3765	0.0000	3.53E-07
311	0.00	0.000	0.021	0.2776	0.3764	0.0000	3.53E-07
312	0.00	0.000	0.005	0.2771	0.3763	0.0000	3.53E-07

313		0.00	0.000	0.001	0.2770	0.3762	0.0000	3.53E-07
314		0.00	0.000	0.000	0.2770	0.3761	0.0000	3.53E-07
315		0.00	0.000	0.000	0.2770	0.3760	0.0000	3.53E-07
316		0.00	0.000	0.000	0.2770	0.3759	0.0000	3.53E-07
317		0.00	0.000	0.000	0.2770	0.3758	0.0000	3.53E-07
318		0.15	0.000	0.031	0.2892	0.3757	0.0000	3.52E-07
319		0.00	0.000	0.011	0.2880	0.3755	0.0000	3.52E-07
320		0.00	0.000	0.010	0.2871	0.3754	0.0000	3.52E-07
321		0.00	0.000	0.011	0.2860	0.3753	0.0000	3.52E-07
322		0.00	0.000	0.011	0.2848	0.3752	0.0000	3.52E-07
323		0.35	0.158	0.041	0.2997	0.3751	0.0000	3.52E-07
324		0.00	0.000	0.011	0.2987	0.3750	0.0000	3.52E-07
325		0.00	0.000	0.011	0.2975	0.3749	0.0000	3.52E-07
326		0.00	0.000	0.010	0.2965	0.3748	0.0000	3.52E-07
327		0.00	0.000	0.010	0.2955	0.3747	0.0000	3.52E-07
328		0.00	0.000	0.010	0.2946	0.3746	0.0000	3.51E-07
329		0.00	0.000	0.009	0.2936	0.3744	0.0000	3.51E-07
330		0.00	0.000	0.009	0.2927	0.3743	0.0000	3.51E-07
331	*	0.00	0.000	0.000	0.2927	0.3742	0.0000	3.51E-07
332		0.19	0.037	0.033	0.3048	0.3741	0.0000	3.51E-07
333		0.06	0.000	0.055	0.3056	0.3740	0.0000	3.51E-07
334		0.66	0.471	0.063	0.3181	0.3739	0.0000	3.51E-07
335		0.00	0.000	0.060	0.3121	0.3738	0.0000	3.51E-07
336		0.06	0.000	0.047	0.3131	0.3737	0.0000	3.51E-07
337	*	0.16	0.000	0.030	0.3150	0.3736	0.0000	3.51E-07
338	*	0.02	0.000	0.035	0.3170	0.3735	0.0000	3.51E-07
339	*	0.28	0.000	0.027	0.3190	0.3733	0.0000	3.50E-07
340		0.08	0.236	0.030	0.3317	0.3732	0.0000	3.50E-07
341		0.00	0.000	0.028	0.3289	0.3732	0.0000	3.50E-07
342		0.00	0.000	0.034	0.3255	0.3732	0.0000	3.50E-07
343	*	0.00	0.000	0.018	0.3237	0.3731	0.0000	3.50E-07
344		0.00	0.000	0.037	0.3200	0.3729	0.0000	3.50E-07

345		0.11	0.000	0.070	0.3243	0.3728	0.0000	3.50E-07
346		0.00	0.000	0.058	0.3185	0.3727	0.0000	3.50E-07
347	*	0.00	0.000	0.024	0.3161	0.3726	0.0000	3.50E-07
348	*	0.00	0.000	0.000	0.3161	0.3725	0.0000	3.50E-07
349		0.00	0.000	0.040	0.3122	0.3724	0.0000	3.50E-07
350		0.00	0.000	0.058	0.3063	0.3723	0.0000	3.50E-07
351		0.01	0.000	0.132	0.2941	0.3722	0.0000	3.49E-07
352		0.42	0.204	0.085	0.3077	0.3721	0.0000	3.49E-07
353		0.06	0.000	0.130	0.3004	0.3720	0.0000	3.49E-07
354		0.17	0.016	0.077	0.3084	0.3719	0.0000	3.49E-07
355		0.00	0.000	0.055	0.3029	0.3718	0.0000	3.49E-07
356		0.00	0.000	0.071	0.2958	0.3716	0.0000	3.49E-07
357		0.24	0.070	0.085	0.3042	0.3715	0.0000	3.49E-07
358		0.34	0.141	0.106	0.3134	0.3714	0.0000	3.49E-07
359		0.00	0.000	0.034	0.3099	0.3713	0.0000	3.49E-07
360		0.23	0.072	0.071	0.3190	0.3712	0.0000	3.49E-07
361		0.01	0.000	0.035	0.3162	0.3711	0.0000	3.49E-07
362		0.00	0.000	0.048	0.3114	0.3710	0.0000	3.48E-07
363		0.00	0.000	0.035	0.3080	0.3709	0.0000	3.48E-07
364		0.00	0.000	0.027	0.3052	0.3708	0.0000	3.48E-07
365		0.00	0.000	0.036	0.3016	0.3707	0.0000	3.48E-07

* = Frozen (air or soil)

Annual Totals for Year 16			
	inches	cubic feet	percent
Precipitation	43.48	157,837.2	100.00
Runoff	25.791	93,620.2	59.31
Evapotranspiration	17.578	63,807.7	40.43
Recirculation into Layer 1	0.0162	58.9	0.04
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0162	58.9	0.04
Percolation/Leakage through Layer 5	0.000134	0.4854	0.00
Average Head on Top of Layer 4	0.3908	---	---
Change in Water Storage	0.1126	408.8	0.26
Soil Water at Start of Year	1,406.7186	5,106,388.6	3235.23
Soil Water at End of Year	1,406.8312	5,106,797.3	3235.48
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0162	-58.9	-0.04

Daily Output for Year 17

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.061	0.2956	0.3704	0.0000	3.48E-07
2			0.01	0.000	0.044	0.2923	0.3703	0.0000	3.48E-07
3			0.82	0.583	0.077	0.3086	0.3702	0.0000	3.48E-07
4			0.00	0.000	0.055	0.3031	0.3701	0.0000	3.48E-07
5			0.00	0.000	0.038	0.2993	0.3700	0.0000	3.48E-07
6			0.38	0.184	0.058	0.3134	0.3699	0.0000	3.47E-07
7			0.00	0.000	0.049	0.3084	0.3698	0.0000	3.47E-07
8			0.00	0.000	0.025	0.3060	0.3697	0.0000	3.47E-07
9	*		0.00	0.000	0.000	0.3060	0.3696	0.0000	3.47E-07
10	*		0.00	0.000	0.000	0.3060	0.3695	0.0000	3.47E-07
11	*		0.00	0.000	0.000	0.3060	0.3694	0.0000	3.47E-07
12			0.00	0.000	0.038	0.3022	0.3693	0.0000	3.47E-07
13	*		0.00	0.000	0.000	0.3022	0.3692	0.0000	3.47E-07
14	*		0.00	0.000	0.000	0.3022	0.3690	0.0000	3.47E-07
15	*		0.00	0.000	0.000	0.3022	0.3689	0.0000	3.47E-07
16			0.00	0.000	0.038	0.2984	0.3688	0.0000	3.47E-07
17			0.00	0.000	0.042	0.2942	0.3687	0.0000	3.46E-07
18	*		0.00	0.000	0.019	0.2924	0.3686	0.0000	3.46E-07
19			0.00	0.000	0.035	0.2889	0.3685	0.0000	3.46E-07
20			0.00	0.000	0.062	0.2826	0.3684	0.0000	3.46E-07
21			0.00	0.000	0.048	0.2778	0.3683	0.0000	3.46E-07
22			0.00	0.000	0.006	0.2772	0.3682	0.0000	3.46E-07
23			0.00	0.000	0.002	0.2771	0.3681	0.0000	3.46E-07
24			0.00	0.000	0.001	0.2770	0.3680	0.0000	3.46E-07

25		0.00	0.000	0.000	0.2770	0.3679	0.0000	3.46E-07
26	*	0.00	0.000	0.000	0.2770	0.3678	0.0000	3.46E-07
27		0.00	0.000	0.000	0.2770	0.3676	0.0000	3.46E-07
28		0.00	0.000	0.000	0.2770	0.3675	0.0000	3.45E-07
29		0.00	0.000	0.000	0.2770	0.3674	0.0000	3.45E-07
30		0.00	0.000	0.000	0.2770	0.3673	0.0000	3.45E-07
31		0.00	0.000	0.000	0.2770	0.3672	0.0000	3.45E-07
32		0.00	0.000	0.000	0.2770	0.3671	0.0000	3.45E-07
33	*	0.00	0.000	0.000	0.2770	0.3670	0.0000	3.45E-07
34	*	0.00	0.000	0.000	0.2770	0.3669	0.0000	3.45E-07
35		0.01	0.000	0.013	0.2772	0.3668	0.0000	3.45E-07
36		0.24	0.085	0.032	0.2898	0.3667	0.0000	3.45E-07
37	*	0.13	0.000	0.050	0.2917	0.3666	0.0000	3.45E-07
38	*	0.01	0.000	0.021	0.2937	0.3665	0.0000	3.45E-07
39	*	0.00	0.000	0.045	0.2929	0.3664	0.0000	3.44E-07
40	*	0.00	0.000	0.000	0.2929	0.3662	0.0000	3.44E-07
41	*	0.00	0.000	0.012	0.2918	0.3661	0.0000	3.44E-07
42		0.46	0.284	0.041	0.3057	0.3660	0.0000	3.44E-07
43	*	0.00	0.000	0.000	0.3057	0.3659	0.0000	3.44E-07
44	*	0.00	0.000	0.000	0.3057	0.3658	0.0000	3.44E-07
45	*	0.17	0.000	0.055	0.3077	0.3657	0.0000	3.44E-07
46		0.00	0.000	0.086	0.3084	0.3656	0.0000	3.44E-07
47		0.06	0.000	0.064	0.3081	0.3655	0.0000	3.44E-07
48		0.00	0.000	0.083	0.2998	0.3654	0.0000	3.44E-07
49		0.00	0.000	0.064	0.2934	0.3653	0.0000	3.44E-07
50		0.00	0.000	0.036	0.2898	0.3652	0.0000	3.43E-07
51		0.00	0.000	0.030	0.2871	0.3651	0.0000	3.43E-07
52		0.00	0.000	0.029	0.2842	0.3650	0.0000	3.43E-07
53	*	0.00	0.000	0.025	0.2817	0.3649	0.0000	3.43E-07
54		0.00	0.000	0.025	0.2792	0.3648	0.0000	3.43E-07
55		0.00	0.000	0.019	0.2773	0.3647	0.0000	3.43E-07
56		0.00	0.000	0.002	0.2771	0.3646	0.0000	3.43E-07

57		0.05	0.000	0.024	0.2801	0.3644	0.0000	3.43E-07
58		0.00	0.000	0.002	0.2800	0.3643	0.0000	3.43E-07
59		0.06	0.000	0.030	0.2827	0.3642	0.0000	3.43E-07
60		0.00	0.000	0.011	0.2816	0.3641	0.0000	3.43E-07
61		0.00	0.000	0.009	0.2807	0.3640	0.0000	3.42E-07
62	*	0.00	0.000	0.011	0.2796	0.3639	0.0000	3.42E-07
63		0.17	0.020	0.034	0.2909	0.3638	0.0000	3.42E-07
64		0.00	0.000	0.010	0.2902	0.3637	0.0000	3.42E-07
65		0.00	0.000	0.011	0.2891	0.3636	0.0000	3.42E-07
66		0.00	0.000	0.010	0.2881	0.3635	0.0000	3.42E-07
67		0.00	0.000	0.010	0.2870	0.3634	0.0000	3.42E-07
68		0.00	0.000	0.010	0.2861	0.3633	0.0000	3.42E-07
69		0.74	0.551	0.039	0.3012	0.3632	0.0000	3.42E-07
70		0.00	0.000	0.038	0.2974	0.3631	0.0000	3.42E-07
71	*	0.00	0.000	0.000	0.2974	0.3630	0.0000	3.42E-07
72	*	0.00	0.000	0.000	0.2974	0.3629	0.0000	3.41E-07
73		0.29	0.105	0.093	0.3065	0.3628	0.0000	3.41E-07
74		0.00	0.000	0.030	0.3035	0.3627	0.0000	3.41E-07
75		0.00	0.000	0.051	0.2984	0.3626	0.0000	3.41E-07
76		0.12	0.000	0.079	0.3028	0.3624	0.0000	3.41E-07
77	*	0.25	0.000	0.030	0.3048	0.3623	0.0000	3.41E-07
78	*	0.00	0.000	0.032	0.3068	0.3622	0.0000	3.41E-07
79	*	0.08	0.000	0.019	0.3087	0.3621	0.0000	3.41E-07
80		0.00	0.008	0.122	0.3151	0.3620	0.0000	3.41E-07
81		0.00	0.000	0.086	0.3065	0.3619	0.0000	3.41E-07
82		0.00	0.000	0.071	0.2995	0.3618	0.0000	3.41E-07
83		0.00	0.000	0.200	0.2795	0.3617	0.0000	3.40E-07
84		0.00	0.000	0.019	0.2776	0.3616	0.0000	3.40E-07
85		0.00	0.000	0.004	0.2771	0.3615	0.0000	3.40E-07
86		0.00	0.000	0.001	0.2770	0.3614	0.0000	3.40E-07
87		0.00	0.000	0.000	0.2770	0.3613	0.0000	3.40E-07
88		0.00	0.000	0.000	0.2770	0.3612	0.0000	3.40E-07

89		0.00	0.000	0.000	0.2770	0.3611	0.0000	3.40E-07
90		0.00	0.000	0.000	0.2770	0.3610	0.0000	3.40E-07
91		0.00	0.000	0.000	0.2770	0.3609	0.0000	3.40E-07
92	*	0.00	0.000	0.000	0.2770	0.3608	0.0000	3.40E-07
93		0.00	0.000	0.000	0.2770	0.3606	0.0000	3.40E-07
94		0.04	0.000	0.021	0.2786	0.3605	0.0000	3.39E-07
95		0.38	0.189	0.044	0.2933	0.3604	0.0000	3.39E-07
96		0.06	0.000	0.030	0.2963	0.3603	0.0000	3.39E-07
97		0.32	0.155	0.042	0.3088	0.3602	0.0000	3.39E-07
98		0.00	0.000	0.012	0.3076	0.3601	0.0000	3.39E-07
99		0.00	0.000	0.011	0.3065	0.3600	0.0000	3.39E-07
100		0.07	0.000	0.034	0.3103	0.3599	0.0000	3.39E-07
101		0.00	0.000	0.012	0.3090	0.3598	0.0000	3.39E-07
102		0.18	0.020	0.035	0.3213	0.3597	0.0000	3.39E-07
103		0.23	0.088	0.037	0.3318	0.3596	0.0000	3.39E-07
104		0.00	0.000	0.123	0.3195	0.3595	0.0000	3.39E-07
105		0.93	0.750	0.039	0.3336	0.3594	0.0000	3.38E-07
106		0.00	0.000	0.089	0.3247	0.3593	0.0000	3.38E-07
107		0.00	0.000	0.305	0.2942	0.3592	0.0000	3.38E-07
108		0.36	0.143	0.156	0.3005	0.3591	0.0000	3.38E-07
109		0.00	0.000	0.207	0.2798	0.3590	0.0000	3.38E-07
110		1.88	1.637	0.079	0.2959	0.3589	0.0000	3.38E-07
111		0.00	0.000	0.093	0.2867	0.3588	0.0000	3.38E-07
112		0.00	0.000	0.059	0.2808	0.3587	0.0000	3.38E-07
113		0.00	0.000	0.030	0.2778	0.3586	0.0000	3.38E-07
114	*	0.00	0.000	0.007	0.2771	0.3584	0.0000	3.38E-07
115		0.00	0.000	0.001	0.2770	0.3583	0.0000	3.38E-07
116		0.00	0.000	0.000	0.2770	0.3582	0.0000	3.37E-07
117		0.00	0.000	0.000	0.2770	0.3581	0.0000	3.37E-07
118		0.00	0.000	0.000	0.2770	0.3580	0.0000	3.37E-07
119		1.73	1.507	0.056	0.2933	0.3579	0.0000	3.37E-07
120		1.25	1.046	0.090	0.3049	0.3578	0.0000	3.37E-07

121	0.00	0.000	0.033	0.3016	0.3577	0.0000	3.37E-07
122	0.00	0.000	0.132	0.2884	0.3576	0.0000	3.37E-07
123	0.78	0.426	0.204	0.3034	0.3575	0.0000	3.37E-07
124	0.06	0.000	0.129	0.2969	0.3574	0.0000	3.37E-07
125	0.00	0.000	0.117	0.2855	0.3573	0.0000	3.37E-07
126	0.00	0.000	0.073	0.2782	0.3572	0.0000	3.37E-07
127	0.00	0.000	0.009	0.2773	0.3571	0.0000	3.36E-07
128	0.00	0.000	0.002	0.2771	0.3570	0.0000	3.36E-07
129	0.00	0.000	0.001	0.2770	0.3569	0.0000	3.36E-07
130	0.47	0.259	0.067	0.2916	0.3568	0.0000	3.36E-07
131	0.07	0.000	0.078	0.2911	0.3567	0.0000	3.36E-07
132	0.91	0.710	0.078	0.3037	0.3566	0.0000	3.36E-07
133	0.66	0.365	0.176	0.3152	0.3565	0.0000	3.36E-07
134	0.04	0.000	0.059	0.3135	0.3564	0.0000	3.36E-07
135	0.48	0.275	0.080	0.3263	0.3563	0.0000	3.36E-07
136	0.00	0.000	0.048	0.3220	0.3562	0.0000	3.36E-07
137	0.00	0.000	0.196	0.3024	0.3560	0.0000	3.36E-07
138	0.00	0.000	0.083	0.2941	0.3559	0.0000	3.35E-07
139	1.29	0.850	0.301	0.3082	0.3558	0.0000	3.35E-07
140	0.01	0.000	0.233	0.2855	0.3557	0.0000	3.35E-07
141	0.00	0.000	0.075	0.2780	0.3556	0.0000	3.35E-07
142	0.00	0.000	0.008	0.2772	0.3555	0.0000	3.35E-07
143	0.00	0.000	0.002	0.2770	0.3554	0.0000	3.35E-07
144	0.00	0.000	0.000	0.2770	0.3553	0.0000	3.35E-07
145	0.00	0.000	0.000	0.2770	0.3552	0.0000	3.35E-07
146	0.00	0.000	0.000	0.2770	0.3551	0.0000	3.35E-07
147	0.00	0.000	0.000	0.2770	0.3550	0.0000	3.35E-07
148	0.00	0.000	0.000	0.2770	0.3549	0.0000	3.35E-07
149	0.00	0.000	0.000	0.2770	0.3548	0.0000	3.35E-07
150	0.00	0.000	0.000	0.2770	0.3547	0.0000	3.34E-07
151	0.01	0.000	0.008	0.2770	0.3546	0.0000	3.34E-07
152	0.01	0.000	0.010	0.2770	0.3545	0.0000	3.34E-07

153	0.01	0.000	0.007	0.2770	0.3544	0.0000	3.34E-07
154	0.00	0.000	0.000	0.2770	0.3543	0.0000	3.34E-07
155	0.00	0.000	0.000	0.2770	0.3542	0.0000	3.34E-07
156	0.13	0.000	0.026	0.2875	0.3541	0.0000	3.34E-07
157	0.00	0.000	0.009	0.2866	0.3540	0.0000	3.34E-07
158	0.00	0.000	0.011	0.2855	0.3539	0.0000	3.34E-07
159	0.00	0.000	0.013	0.2841	0.3538	0.0000	3.34E-07
160	0.55	0.357	0.045	0.2984	0.3537	0.0000	3.34E-07
161	0.23	0.086	0.036	0.3091	0.3536	0.0000	3.33E-07
162	0.00	0.000	0.014	0.3077	0.3535	0.0000	3.33E-07
163	0.00	0.000	0.013	0.3065	0.3534	0.0000	3.33E-07
164	0.00	0.000	0.012	0.3053	0.3533	0.0000	3.33E-07
165	0.24	0.077	0.037	0.3179	0.3531	0.0000	3.33E-07
166	0.01	0.000	0.069	0.3123	0.3530	0.0000	3.33E-07
167	0.02	0.000	0.069	0.3071	0.3529	0.0000	3.33E-07
168	0.05	0.000	0.116	0.3007	0.3528	0.0000	3.33E-07
169	0.00	0.000	0.050	0.2956	0.3527	0.0000	3.33E-07
170	0.00	0.000	0.044	0.2912	0.3526	0.0000	3.33E-07
171	0.00	0.000	0.035	0.2877	0.3525	0.0000	3.33E-07
172	0.00	0.000	0.034	0.2843	0.3524	0.0000	3.32E-07
173	0.00	0.000	0.027	0.2817	0.3523	0.0000	3.32E-07
174	0.00	0.000	0.026	0.2791	0.3522	0.0000	3.32E-07
175	0.00	0.000	0.018	0.2773	0.3521	0.0000	3.32E-07
176	0.00	0.000	0.005	0.2771	0.3520	0.0000	3.32E-07
177	0.09	0.000	0.027	0.2835	0.3519	0.0000	3.32E-07
178	0.21	0.057	0.037	0.2956	0.3518	0.0000	3.32E-07
179	0.28	0.115	0.046	0.3071	0.3517	0.0000	3.32E-07
180	0.29	0.119	0.154	0.3084	0.3516	0.0000	3.32E-07
181	0.00	0.000	0.015	0.3068	0.3515	0.0000	3.32E-07
182	0.06	0.000	0.036	0.3089	0.3514	0.0000	3.32E-07
183	0.00	0.000	0.016	0.3073	0.3513	0.0000	3.31E-07
184	0.00	0.000	0.017	0.3057	0.3512	0.0000	3.31E-07

185	0.00	0.000	0.017	0.3039	0.3511	0.0000	3.31E-07
186	0.00	0.000	0.014	0.3026	0.3510	0.0000	3.31E-07
187	0.00	0.000	0.017	0.3009	0.3509	0.0000	3.31E-07
188	0.00	0.000	0.016	0.2993	0.3508	0.0000	3.31E-07
189	0.00	0.000	0.015	0.2977	0.3507	0.0000	3.31E-07
190	0.00	0.000	0.015	0.2963	0.3506	0.0000	3.31E-07
191	0.03	0.000	0.030	0.2964	0.3505	0.0000	3.31E-07
192	0.00	0.000	0.014	0.2950	0.3504	0.0000	3.31E-07
193	0.03	0.000	0.032	0.2946	0.3503	0.0000	3.31E-07
194	0.29	0.118	0.047	0.3073	0.3502	0.0000	3.31E-07
195	0.54	0.227	0.328	0.3057	0.3501	0.0000	3.30E-07
196	1.16	0.819	0.231	0.3168	0.3500	0.0000	3.30E-07
197	0.00	0.000	0.080	0.3088	0.3499	0.0000	3.30E-07
198	0.00	0.000	0.105	0.2983	0.3498	0.0000	3.30E-07
199	0.00	0.000	0.182	0.2802	0.3497	0.0000	3.30E-07
200	0.00	0.000	0.028	0.2774	0.3496	0.0000	3.30E-07
201	0.00	0.000	0.003	0.2771	0.3494	0.0000	3.30E-07
202	0.04	0.000	0.025	0.2784	0.3493	0.0000	3.30E-07
203	0.41	0.203	0.064	0.2930	0.3492	0.0000	3.30E-07
204	0.02	0.000	0.114	0.2836	0.3491	0.0000	3.30E-07
205	0.13	0.000	0.049	0.2920	0.3490	0.0000	3.30E-07
206	0.01	0.000	0.036	0.2892	0.3489	0.0000	3.29E-07
207	0.18	0.018	0.053	0.2997	0.3488	0.0000	3.29E-07
208	0.04	0.000	0.045	0.2990	0.3487	0.0000	3.29E-07
209	0.00	0.000	0.022	0.2968	0.3486	0.0000	3.29E-07
210	0.00	0.000	0.018	0.2950	0.3485	0.0000	3.29E-07
211	0.00	0.000	0.017	0.2933	0.3484	0.0000	3.29E-07
212	0.00	0.000	0.020	0.2913	0.3483	0.0000	3.29E-07
213	0.00	0.000	0.019	0.2895	0.3482	0.0000	3.29E-07
214	0.00	0.000	0.021	0.2873	0.3481	0.0000	3.29E-07
215	0.32	0.135	0.047	0.3011	0.3480	0.0000	3.29E-07
216	0.09	0.000	0.177	0.2924	0.3479	0.0000	3.29E-07

217	0.19	0.038	0.045	0.3033	0.3478	0.0000	3.28E-07
218	0.00	0.000	0.164	0.2869	0.3477	0.0000	3.28E-07
219	0.00	0.000	0.018	0.2851	0.3476	0.0000	3.28E-07
220	0.00	0.000	0.021	0.2830	0.3475	0.0000	3.28E-07
221	0.00	0.000	0.018	0.2813	0.3474	0.0000	3.28E-07
222	0.00	0.000	0.023	0.2790	0.3473	0.0000	3.28E-07
223	0.00	0.000	0.016	0.2774	0.3472	0.0000	3.28E-07
224	0.00	0.000	0.003	0.2771	0.3471	0.0000	3.28E-07
225	0.00	0.000	0.001	0.2770	0.3470	0.0000	3.28E-07
226	0.00	0.000	0.000	0.2770	0.3469	0.0000	3.28E-07
227	0.09	0.000	0.027	0.2832	0.3468	0.0000	3.28E-07
228	0.00	0.000	0.008	0.2824	0.3467	0.0000	3.28E-07
229	0.00	0.000	0.010	0.2813	0.3466	0.0000	3.27E-07
230	0.00	0.000	0.015	0.2800	0.3465	0.0000	3.27E-07
231	0.01	0.000	0.021	0.2788	0.3464	0.0000	3.27E-07
232	0.24	0.077	0.037	0.2913	0.3463	0.0000	3.27E-07
233	0.00	0.000	0.008	0.2905	0.3462	0.0000	3.27E-07
234	0.29	0.108	0.047	0.3038	0.3461	0.0000	3.27E-07
235	0.00	0.000	0.052	0.2986	0.3460	0.0000	3.27E-07
236	0.00	0.000	0.015	0.2971	0.3459	0.0000	3.27E-07
237	0.00	0.000	0.011	0.2960	0.3458	0.0000	3.27E-07
238	0.16	0.012	0.041	0.3071	0.3457	0.0000	3.27E-07
239	0.00	0.000	0.132	0.2938	0.3456	0.0000	3.27E-07
240	0.00	0.000	0.014	0.2924	0.3455	0.0000	3.26E-07
241	0.00	0.000	0.015	0.2910	0.3454	0.0000	3.26E-07
242	0.00	0.000	0.012	0.2897	0.3453	0.0000	3.26E-07
243	0.00	0.000	0.010	0.2887	0.3452	0.0000	3.26E-07
244	0.00	0.000	0.011	0.2877	0.3451	0.0000	3.26E-07
245	0.00	0.000	0.012	0.2865	0.3450	0.0000	3.26E-07
246	0.00	0.000	0.012	0.2853	0.3449	0.0000	3.26E-07
247	0.00	0.000	0.009	0.2844	0.3448	0.0000	3.26E-07
248	0.00	0.000	0.011	0.2833	0.3447	0.0000	3.26E-07

249		0.17	0.009	0.037	0.2957	0.3446	0.0000	3.26E-07
250		1.78	1.624	0.039	0.3070	0.3445	0.0000	3.26E-07
251		0.06	0.000	0.111	0.3018	0.3444	0.0000	3.26E-07
252		0.00	0.000	0.109	0.2909	0.3443	0.0000	3.25E-07
253		0.00	0.000	0.040	0.2869	0.3442	0.0000	3.25E-07
254		0.24	0.076	0.131	0.2904	0.3441	0.0000	3.25E-07
255		0.09	0.000	0.105	0.2890	0.3440	0.0000	3.25E-07
256		0.06	0.000	0.095	0.2856	0.3439	0.0000	3.25E-07
257		0.27	0.089	0.109	0.2931	0.3438	0.0000	3.25E-07
258		0.00	0.000	0.105	0.2826	0.3437	0.0000	3.25E-07
259		0.00	0.000	0.041	0.2785	0.3436	0.0000	3.25E-07
260		0.00	0.000	0.011	0.2774	0.3435	0.0000	3.25E-07
261		0.06	0.000	0.030	0.2800	0.3434	0.0000	3.25E-07
262		0.12	0.000	0.030	0.2886	0.3433	0.0000	3.25E-07
263		0.13	0.000	0.041	0.2975	0.3432	0.0000	3.24E-07
264		0.00	0.000	0.013	0.2962	0.3431	0.0000	3.24E-07
265		0.00	0.000	0.019	0.2943	0.3430	0.0000	3.24E-07
266		0.00	0.000	0.017	0.2926	0.3429	0.0000	3.24E-07
267		0.44	0.252	0.050	0.3066	0.3428	0.0000	3.24E-07
268		1.59	1.385	0.089	0.3182	0.3427	0.0000	3.24E-07
269		1.50	1.308	0.072	0.3298	0.3426	0.0000	3.24E-07
270		0.69	0.504	0.073	0.3413	0.3425	0.0000	3.24E-07
271		0.10	0.007	0.152	0.3356	0.3424	0.0000	3.24E-07
272		1.83	1.588	0.121	0.3476	0.3423	0.0000	3.24E-07
273		0.77	0.602	0.159	0.3487	0.3422	0.0000	3.24E-07
274		0.17	0.040	0.087	0.3530	0.3421	0.0000	3.24E-07
275		0.01	0.000	0.061	0.3481	0.3420	0.0000	3.23E-07
276		0.00	0.000	0.074	0.3408	0.3419	0.0000	3.23E-07
277	*	0.00	0.000	0.054	0.3354	0.3418	0.0000	3.23E-07
278		0.00	0.000	0.104	0.3249	0.3417	0.0000	3.23E-07
279		0.00	0.000	0.149	0.3100	0.3416	0.0000	3.23E-07
280		0.00	0.000	0.141	0.2959	0.3415	0.0000	3.23E-07

281	0.13	0.000	0.153	0.2935	0.3414	0.0000	3.23E-07
282	0.01	0.000	0.062	0.2885	0.3413	0.0000	3.23E-07
283	0.03	0.000	0.058	0.2853	0.3412	0.0000	3.23E-07
284	0.39	0.198	0.062	0.2986	0.3411	0.0000	3.23E-07
285	0.10	0.000	0.084	0.2997	0.3413	0.0000	3.23E-07
286	0.24	0.076	0.055	0.3105	0.3416	0.0000	3.23E-07
287	0.00	0.000	0.028	0.3077	0.3415	0.0000	3.23E-07
288	0.00	0.000	0.045	0.3032	0.3414	0.0000	3.23E-07
289	0.00	0.000	0.070	0.2962	0.3413	0.0000	3.23E-07
290	0.00	0.000	0.059	0.2903	0.3412	0.0000	3.23E-07
291	0.00	0.000	0.059	0.2844	0.3411	0.0000	3.23E-07
292	0.01	0.000	0.047	0.2804	0.3410	0.0000	3.23E-07
293	0.00	0.000	0.031	0.2773	0.3409	0.0000	3.23E-07
294	0.00	0.000	0.003	0.2771	0.3408	0.0000	3.22E-07
295	0.00	0.000	0.001	0.2770	0.3407	0.0000	3.22E-07
296	0.00	0.000	0.000	0.2770	0.3406	0.0000	3.22E-07
297	0.00	0.000	0.000	0.2770	0.3405	0.0000	3.22E-07
298	0.00	0.000	0.000	0.2770	0.3404	0.0000	3.22E-07
299	0.00	0.000	0.000	0.2770	0.3403	0.0000	3.22E-07
300	0.00	0.000	0.000	0.2770	0.3402	0.0000	3.22E-07
301	0.00	0.000	0.000	0.2770	0.3401	0.0000	3.22E-07
302	0.00	0.000	0.000	0.2770	0.3400	0.0000	3.22E-07
303	0.00	0.000	0.000	0.2770	0.3399	0.0000	3.22E-07
304	0.06	0.000	0.026	0.2805	0.3398	0.0000	3.22E-07
305	0.04	0.000	0.023	0.2826	0.3397	0.0000	3.21E-07
306	0.09	0.000	0.033	0.2883	0.3396	0.0000	3.21E-07
307	0.16	0.016	0.035	0.2997	0.3395	0.0000	3.21E-07
308	0.07	0.000	0.032	0.3036	0.3394	0.0000	3.21E-07
309	0.00	0.000	0.011	0.3026	0.3393	0.0000	3.21E-07
310	0.00	0.000	0.010	0.3016	0.3392	0.0000	3.21E-07
311	0.00	0.000	0.010	0.3006	0.3391	0.0000	3.21E-07
312	0.00	0.000	0.010	0.2996	0.3390	0.0000	3.21E-07

313		0.00	0.000	0.010	0.2986	0.3389	0.0000	3.21E-07
314		0.00	0.000	0.009	0.2977	0.3388	0.0000	3.21E-07
315		0.00	0.000	0.009	0.2968	0.3387	0.0000	3.21E-07
316		0.22	0.060	0.036	0.3096	0.3386	0.0000	3.21E-07
317		0.00	0.000	0.011	0.3085	0.3385	0.0000	3.20E-07
318		0.00	0.000	0.010	0.3075	0.3384	0.0000	3.20E-07
319		0.00	0.000	0.009	0.3066	0.3383	0.0000	3.20E-07
320		0.00	0.000	0.008	0.3058	0.3382	0.0000	3.20E-07
321		0.00	0.000	0.008	0.3050	0.3381	0.0000	3.20E-07
322		0.04	0.000	0.029	0.3066	0.3380	0.0000	3.20E-07
323		0.00	0.000	0.009	0.3056	0.3379	0.0000	3.20E-07
324		0.10	0.000	0.035	0.3124	0.3378	0.0000	3.20E-07
325		0.00	0.000	0.009	0.3115	0.3377	0.0000	3.20E-07
326		0.00	0.000	0.010	0.3105	0.3376	0.0000	3.20E-07
327		0.00	0.000	0.008	0.3097	0.3375	0.0000	3.20E-07
328		0.00	0.000	0.007	0.3090	0.3374	0.0000	3.20E-07
329		0.00	0.000	0.008	0.3083	0.3373	0.0000	3.19E-07
330	*	0.00	0.000	0.000	0.3083	0.3372	0.0000	3.19E-07
331		0.00	0.000	0.009	0.3074	0.3371	0.0000	3.19E-07
332		0.00	0.000	0.008	0.3066	0.3370	0.0000	3.19E-07
333		0.00	0.000	0.008	0.3057	0.3369	0.0000	3.19E-07
334		0.00	0.000	0.008	0.3049	0.3368	0.0000	3.19E-07
335		0.00	0.000	0.008	0.3041	0.3367	0.0000	3.19E-07
336		0.00	0.000	0.008	0.3033	0.3366	0.0000	3.19E-07
337		0.00	0.000	0.008	0.3025	0.3365	0.0000	3.19E-07
338		0.00	0.000	0.008	0.3017	0.3365	0.0000	3.19E-07
339		0.00	0.000	0.008	0.3010	0.3364	0.0000	3.19E-07
340		0.00	0.000	0.008	0.3002	0.3363	0.0000	3.19E-07
341		0.00	0.000	0.008	0.2995	0.3362	0.0000	3.18E-07
342		0.00	0.000	0.008	0.2987	0.3361	0.0000	3.18E-07
343	*	0.00	0.000	0.000	0.2987	0.3360	0.0000	3.18E-07
344	*	0.31	0.000	0.018	0.3007	0.3359	0.0000	3.18E-07

345	*	0.03	0.000	0.000	0.3026	0.3358	0.0000	3.18E-07
346	*	0.05	0.000	0.000	0.3046	0.3357	0.0000	3.18E-07
347	*	0.06	0.000	0.016	0.3066	0.3356	0.0000	3.18E-07
348	*	0.07	0.000	0.009	0.3086	0.3355	0.0000	3.18E-07
349	*	0.00	0.000	0.006	0.3105	0.3354	0.0000	3.18E-07
350	*	0.00	0.000	0.005	0.3125	0.3353	0.0000	3.18E-07
351	*	0.00	0.000	0.000	0.3145	0.3352	0.0000	3.18E-07
352		0.08	0.257	0.012	0.3272	0.3351	0.0000	3.17E-07
353		0.08	0.000	0.059	0.3288	0.3350	0.0000	3.17E-07
354		0.00	0.000	0.032	0.3256	0.3349	0.0000	3.17E-07
355		0.00	0.000	0.023	0.3233	0.3348	0.0000	3.17E-07
356	*	0.03	0.000	0.022	0.3244	0.3347	0.0000	3.17E-07
357	*	0.04	0.000	0.040	0.3242	0.3346	0.0000	3.17E-07
358		0.00	0.000	0.037	0.3205	0.3345	0.0000	3.17E-07
359		0.00	0.000	0.031	0.3175	0.3345	0.0000	3.17E-07
360		0.00	0.000	0.036	0.3138	0.3344	0.0000	3.17E-07
361	*	0.00	0.000	0.020	0.3118	0.3343	0.0000	3.17E-07
362		0.00	0.000	0.036	0.3082	0.3342	0.0000	3.17E-07
363		0.00	0.000	0.032	0.3050	0.3341	0.0000	3.17E-07
364		0.00	0.000	0.028	0.3022	0.3340	0.0000	3.17E-07
365		0.00	0.000	0.024	0.2998	0.3339	0.0000	3.16E-07

* = Frozen (air or soil)

Annual Totals for Year 17			
	inches	cubic feet	percent
Precipitation	35.29	128,090.7	100.00
Runoff	20.899	75,862.2	59.23
Evapotranspiration	14.418	52,337.2	40.86
Recirculation into Layer 1	0.0146	52.8	0.04
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0146	52.8	0.04
Percolation/Leakage through Layer 5	0.000121	0.4396	0.00
Average Head on Top of Layer 4	0.3516	---	---
Change in Water Storage	-0.0301	-109.2	-0.09
Soil Water at Start of Year	1,406.8312	5,106,797.3	3986.86
Soil Water at End of Year	1,406.8011	5,106,688.2	3986.78
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0146	-52.8	-0.04

Daily Output for Year 18

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.023	0.2975	0.3338	0.0000	3.16E-07
2			0.08	0.000	0.046	0.3005	0.3337	0.0000	3.16E-07
3	*		0.38	0.000	0.024	0.3025	0.3336	0.0000	3.16E-07
4	*	*	0.00	0.000	0.011	0.3025	0.3335	0.0000	3.16E-07
5	*	*	0.00	0.000	0.016	0.3025	0.3334	0.0000	3.16E-07
6	*	*	0.00	0.000	0.008	0.3025	0.3333	0.0000	3.16E-07
7	*	*	0.00	0.000	0.005	0.3025	0.3332	0.0000	3.16E-07
8	*	*	0.00	0.000	0.010	0.3025	0.3331	0.0000	3.16E-07
9	*	*	0.00	0.000	0.000	0.3025	0.3330	0.0000	3.16E-07
10	*	*	0.00	0.000	0.018	0.3025	0.3329	0.0000	3.16E-07
11		*	0.00	0.219	0.040	0.3037	0.3328	0.0000	3.16E-07
12		*	0.01	0.000	0.007	0.3038	0.3327	0.0000	3.15E-07
13			0.00	0.000	0.100	0.2938	0.3326	0.0000	3.15E-07
14			0.00	0.000	0.020	0.2918	0.3325	0.0000	3.15E-07
15			0.00	0.000	0.019	0.2899	0.3324	0.0000	3.15E-07
16			0.00	0.000	0.018	0.2880	0.3324	0.0000	3.15E-07
17			0.00	0.000	0.017	0.2864	0.3323	0.0000	3.15E-07
18	*		0.00	0.000	0.018	0.2846	0.3322	0.0000	3.15E-07
19			0.00	0.000	0.017	0.2829	0.3321	0.0000	3.15E-07
20			0.28	0.120	0.043	0.2947	0.3322	0.0000	3.15E-07
21			0.15	0.007	0.041	0.3049	0.3322	0.0000	3.15E-07
22	*		0.00	0.000	0.025	0.3025	0.3321	0.0000	3.15E-07
23	*		0.00	0.000	0.022	0.3002	0.3320	0.0000	3.15E-07
24	*		0.06	0.000	0.044	0.3020	0.3319	0.0000	3.15E-07

25	*		0.06	0.000	0.042	0.3040	0.3318	0.0000	3.15E-07
26	*		0.15	0.000	0.018	0.3060	0.3317	0.0000	3.15E-07
27	*	*	0.01	0.000	0.031	0.3060	0.3316	0.0000	3.14E-07
28	*	*	0.00	0.000	0.000	0.3060	0.3315	0.0000	3.14E-07
29		*	0.00	0.001	0.084	0.3066	0.3314	0.0000	3.14E-07
30	*	*	0.00	0.000	0.000	0.3067	0.3313	0.0000	3.14E-07
31		*	0.47	0.438	0.026	0.3071	0.3312	0.0000	3.14E-07
32		*	0.19	0.160	0.026	0.3071	0.3311	0.0000	3.14E-07
33			0.07	0.000	0.092	0.3052	0.3310	0.0000	3.14E-07
34			0.00	0.000	0.052	0.2999	0.3309	0.0000	3.14E-07
35			0.00	0.000	0.044	0.2955	0.3311	0.0000	3.14E-07
36			0.09	0.000	0.063	0.2977	0.3310	0.0000	3.14E-07
37			0.00	0.000	0.037	0.2941	0.3309	0.0000	3.14E-07
38			0.00	0.000	0.040	0.2901	0.3308	0.0000	3.14E-07
39	*		0.00	0.000	0.000	0.2901	0.3307	0.0000	3.14E-07
40	*		0.00	0.000	0.000	0.2901	0.3306	0.0000	3.14E-07
41	*		0.00	0.000	0.000	0.2901	0.3305	0.0000	3.14E-07
42	*		0.05	0.000	0.046	0.2901	0.3304	0.0000	3.13E-07
43	*		0.00	0.000	0.031	0.2870	0.3303	0.0000	3.13E-07
44			0.00	0.000	0.052	0.2817	0.3302	0.0000	3.13E-07
45			0.00	0.000	0.041	0.2776	0.3301	0.0000	3.13E-07
46			0.00	0.000	0.005	0.2772	0.3300	0.0000	3.13E-07
47			0.00	0.000	0.002	0.2770	0.3299	0.0000	3.13E-07
48			0.22	0.055	0.049	0.2886	0.3298	0.0000	3.13E-07
49			0.00	0.000	0.066	0.2820	0.3297	0.0000	3.13E-07
50			0.00	0.000	0.026	0.2794	0.3296	0.0000	3.13E-07
51			0.03	0.000	0.043	0.2784	0.3295	0.0000	3.13E-07
52			0.00	0.000	0.005	0.2780	0.3294	0.0000	3.13E-07
53			0.00	0.000	0.006	0.2774	0.3293	0.0000	3.13E-07
54			0.00	0.000	0.004	0.2771	0.3292	0.0000	3.12E-07
55			0.21	0.049	0.036	0.2896	0.3292	0.0000	3.12E-07
56			0.00	0.000	0.009	0.2887	0.3291	0.0000	3.12E-07

57		0.00	0.000	0.014	0.2872	0.3290	0.0000	3.12E-07
58		0.00	0.000	0.013	0.2859	0.3289	0.0000	3.12E-07
59		0.00	0.000	0.013	0.2846	0.3288	0.0000	3.12E-07
60		0.00	0.000	0.012	0.2834	0.3287	0.0000	3.12E-07
61		0.00	0.000	0.012	0.2822	0.3286	0.0000	3.12E-07
62		0.00	0.000	0.011	0.2811	0.3285	0.0000	3.12E-07
63		0.00	0.000	0.011	0.2799	0.3284	0.0000	3.12E-07
64		0.00	0.000	0.011	0.2789	0.3283	0.0000	3.12E-07
65	*	0.00	0.000	0.010	0.2779	0.3282	0.0000	3.12E-07
66		0.00	0.000	0.008	0.2771	0.3281	0.0000	3.11E-07
67		0.00	0.000	0.001	0.2770	0.3280	0.0000	3.11E-07
68		0.08	0.000	0.026	0.2828	0.3279	0.0000	3.11E-07
69		0.27	0.098	0.040	0.2964	0.3278	0.0000	3.11E-07
70		0.08	0.000	0.031	0.3012	0.3277	0.0000	3.11E-07
71		0.01	0.000	0.017	0.3005	0.3276	0.0000	3.11E-07
72		0.00	0.000	0.012	0.2996	0.3275	0.0000	3.11E-07
73		0.51	0.335	0.039	0.3136	0.3274	0.0000	3.11E-07
74		0.00	0.000	0.038	0.3098	0.3273	0.0000	3.11E-07
75		0.00	0.000	0.049	0.3049	0.3272	0.0000	3.11E-07
76	*	0.00	0.000	0.026	0.3024	0.3271	0.0000	3.11E-07
77		0.00	0.000	0.095	0.2929	0.3271	0.0000	3.11E-07
78		0.08	0.000	0.088	0.2925	0.3270	0.0000	3.10E-07
79		0.07	0.000	0.073	0.2918	0.3269	0.0000	3.10E-07
80		0.07	0.000	0.062	0.2926	0.3268	0.0000	3.10E-07
81		0.67	0.472	0.061	0.3065	0.3267	0.0000	3.10E-07
82		0.00	0.000	0.079	0.2986	0.3266	0.0000	3.10E-07
83	*	0.00	0.000	0.030	0.2956	0.3265	0.0000	3.10E-07
84	*	0.00	0.000	0.000	0.2956	0.3264	0.0000	3.10E-07
85		0.00	0.000	0.080	0.2875	0.3263	0.0000	3.10E-07
86		0.00	0.000	0.070	0.2805	0.3262	0.0000	3.10E-07
87		0.00	0.000	0.029	0.2776	0.3261	0.0000	3.10E-07
88		0.00	0.000	0.005	0.2772	0.3260	0.0000	3.10E-07

89		0.00	0.000	0.001	0.2770	0.3259	0.0000	3.10E-07
90		0.00	0.000	0.000	0.2770	0.3258	0.0000	3.09E-07
91		0.68	0.461	0.057	0.2933	0.3257	0.0000	3.09E-07
92		0.02	0.000	0.027	0.2921	0.3256	0.0000	3.09E-07
93	*	0.55	0.000	0.028	0.2941	0.3255	0.0000	3.09E-07
94		0.04	0.388	0.025	0.3067	0.3254	0.0000	3.09E-07
95		0.34	0.161	0.078	0.3169	0.3253	0.0000	3.09E-07
96		0.00	0.000	0.053	0.3117	0.3252	0.0000	3.09E-07
97		0.52	0.268	0.118	0.3252	0.3251	0.0000	3.09E-07
98		0.00	0.000	0.096	0.3156	0.3250	0.0000	3.09E-07
99		0.18	0.025	0.078	0.3238	0.3250	0.0000	3.09E-07
100		0.02	0.000	0.085	0.3174	0.3249	0.0000	3.09E-07
101		0.10	0.000	0.102	0.3168	0.3248	0.0000	3.09E-07
102		0.00	0.000	0.133	0.3035	0.3247	0.0000	3.08E-07
103		0.00	0.000	0.124	0.2911	0.3246	0.0000	3.08E-07
104		0.46	0.187	0.163	0.3026	0.3245	0.0000	3.08E-07
105		0.12	0.000	0.069	0.3080	0.3244	0.0000	3.08E-07
106	*	0.41	0.000	0.047	0.3100	0.3243	0.0000	3.08E-07
107		0.00	0.115	0.101	0.3227	0.3242	0.0000	3.08E-07
108		0.00	0.000	0.052	0.3176	0.3241	0.0000	3.08E-07
109		1.16	0.936	0.090	0.3309	0.3240	0.0000	3.08E-07
110		0.00	0.000	0.056	0.3254	0.3239	0.0000	3.08E-07
111		0.08	0.000	0.113	0.3220	0.3238	0.0000	3.08E-07
112		0.01	0.000	0.052	0.3182	0.3237	0.0000	3.08E-07
113	*	0.00	0.000	0.080	0.3106	0.3236	0.0000	3.08E-07
114		1.01	0.742	0.122	0.3251	0.3235	0.0000	3.07E-07
115		0.00	0.000	0.084	0.3168	0.3234	0.0000	3.07E-07
116		0.00	0.000	0.103	0.3064	0.3233	0.0000	3.07E-07
117		0.13	0.000	0.162	0.3031	0.3232	0.0000	3.07E-07
118		2.19	1.855	0.201	0.3161	0.3232	0.0000	3.07E-07
119		0.00	0.000	0.075	0.3086	0.3231	0.0000	3.07E-07
120		0.00	0.000	0.121	0.2965	0.3230	0.0000	3.07E-07

121	0.11	0.000	0.119	0.2952	0.3229	0.0000	3.07E-07
122	0.31	0.094	0.202	0.2966	0.3228	0.0000	3.07E-07
123	0.00	0.000	0.123	0.2843	0.3227	0.0000	3.07E-07
124	0.00	0.000	0.054	0.2789	0.3226	0.0000	3.07E-07
125	0.00	0.000	0.015	0.2775	0.3225	0.0000	3.07E-07
126	0.21	0.045	0.054	0.2886	0.3224	0.0000	3.06E-07
127	0.01	0.000	0.029	0.2870	0.3223	0.0000	3.06E-07
128	0.40	0.192	0.063	0.3014	0.3222	0.0000	3.06E-07
129	0.01	0.000	0.092	0.2930	0.3221	0.0000	3.06E-07
130	1.04	0.825	0.060	0.3088	0.3220	0.0000	3.06E-07
131	0.28	0.120	0.098	0.3146	0.3219	0.0000	3.06E-07
132	0.00	0.000	0.182	0.2965	0.3218	0.0000	3.06E-07
133	0.00	0.000	0.098	0.2867	0.3217	0.0000	3.06E-07
134	0.00	0.000	0.086	0.2780	0.3216	0.0000	3.06E-07
135	0.00	0.000	0.008	0.2772	0.3215	0.0000	3.06E-07
136	0.00	0.000	0.002	0.2770	0.3215	0.0000	3.06E-07
137	0.00	0.000	0.000	0.2770	0.3214	0.0000	3.06E-07
138	0.00	0.000	0.000	0.2770	0.3213	0.0000	3.06E-07
139	0.44	0.238	0.059	0.2913	0.3212	0.0000	3.05E-07
140	0.00	0.000	0.013	0.2901	0.3211	0.0000	3.05E-07
141	0.00	0.000	0.019	0.2882	0.3210	0.0000	3.05E-07
142	0.00	0.000	0.018	0.2864	0.3209	0.0000	3.05E-07
143	0.54	0.337	0.051	0.3012	0.3208	0.0000	3.05E-07
144	0.01	0.000	0.064	0.2959	0.3207	0.0000	3.05E-07
145	0.07	0.000	0.089	0.2936	0.3206	0.0000	3.05E-07
146	0.00	0.000	0.118	0.2818	0.3205	0.0000	3.05E-07
147	0.00	0.000	0.037	0.2781	0.3205	0.0000	3.05E-07
148	0.40	0.185	0.082	0.2913	0.3205	0.0000	3.05E-07
149	0.24	0.087	0.057	0.3006	0.3204	0.0000	3.05E-07
150	0.00	0.000	0.131	0.2875	0.3203	0.0000	3.05E-07
151	0.00	0.000	0.026	0.2849	0.3202	0.0000	3.05E-07
152	0.00	0.000	0.027	0.2822	0.3201	0.0000	3.05E-07

153	0.17	0.011	0.054	0.2931	0.3200	0.0000	3.04E-07
154	0.00	0.000	0.027	0.2904	0.3199	0.0000	3.04E-07
155	0.00	0.000	0.024	0.2880	0.3198	0.0000	3.04E-07
156	0.00	0.000	0.024	0.2856	0.3197	0.0000	3.04E-07
157	0.00	0.000	0.018	0.2838	0.3196	0.0000	3.04E-07
158	0.00	0.000	0.016	0.2822	0.3196	0.0000	3.04E-07
159	0.00	0.000	0.017	0.2805	0.3195	0.0000	3.04E-07
160	0.00	0.000	0.014	0.2790	0.3194	0.0000	3.04E-07
161	0.00	0.000	0.013	0.2777	0.3193	0.0000	3.04E-07
162	0.00	0.000	0.005	0.2772	0.3192	0.0000	3.04E-07
163	0.00	0.000	0.001	0.2770	0.3191	0.0000	3.04E-07
164	0.26	0.099	0.036	0.2897	0.3190	0.0000	3.04E-07
165	0.05	0.000	0.030	0.2915	0.3189	0.0000	3.03E-07
166	0.32	0.151	0.044	0.3040	0.3188	0.0000	3.03E-07
167	0.00	0.000	0.119	0.2922	0.3187	0.0000	3.03E-07
168	0.00	0.000	0.014	0.2907	0.3186	0.0000	3.03E-07
169	0.00	0.000	0.013	0.2894	0.3185	0.0000	3.03E-07
170	0.05	0.000	0.038	0.2910	0.3184	0.0000	3.03E-07
171	0.19	0.035	0.044	0.3020	0.3183	0.0000	3.03E-07
172	0.03	0.000	0.034	0.3020	0.3183	0.0000	3.03E-07
173	1.33	1.160	0.043	0.3150	0.3182	0.0000	3.03E-07
174	0.39	0.178	0.253	0.3110	0.3181	0.0000	3.03E-07
175	0.05	0.000	0.119	0.3040	0.3180	0.0000	3.03E-07
176	0.00	0.000	0.189	0.2852	0.3179	0.0000	3.03E-07
177	0.00	0.000	0.067	0.2784	0.3178	0.0000	3.02E-07
178	0.02	0.000	0.035	0.2773	0.3177	0.0000	3.02E-07
179	0.00	0.000	0.002	0.2771	0.3176	0.0000	3.02E-07
180	0.00	0.000	0.001	0.2770	0.3175	0.0000	3.02E-07
181	0.00	0.000	0.000	0.2770	0.3174	0.0000	3.02E-07
182	0.00	0.000	0.000	0.2770	0.3173	0.0000	3.02E-07
183	0.00	0.000	0.000	0.2770	0.3172	0.0000	3.02E-07
184	0.00	0.000	0.000	0.2770	0.3171	0.0000	3.02E-07

185	1.74	1.529	0.052	0.2932	0.3170	0.0000	3.02E-07
186	0.00	0.000	0.055	0.2876	0.3170	0.0000	3.02E-07
187	0.00	0.000	0.022	0.2854	0.3169	0.0000	3.02E-07
188	0.00	0.000	0.020	0.2834	0.3168	0.0000	3.02E-07
189	0.00	0.000	0.017	0.2817	0.3167	0.0000	3.02E-07
190	0.03	0.000	0.034	0.2810	0.3166	0.0000	3.01E-07
191	0.00	0.000	0.019	0.2791	0.3165	0.0000	3.01E-07
192	0.00	0.000	0.015	0.2776	0.3164	0.0000	3.01E-07
193	0.00	0.000	0.005	0.2771	0.3163	0.0000	3.01E-07
194	0.00	0.000	0.001	0.2770	0.3162	0.0000	3.01E-07
195	0.00	0.000	0.000	0.2770	0.3161	0.0000	3.01E-07
196	0.00	0.000	0.000	0.2770	0.3160	0.0000	3.01E-07
197	0.03	0.000	0.021	0.2781	0.3159	0.0000	3.01E-07
198	0.26	0.096	0.035	0.2910	0.3158	0.0000	3.01E-07
199	0.00	0.000	0.011	0.2900	0.3157	0.0000	3.01E-07
200	0.06	0.000	0.039	0.2925	0.3157	0.0000	3.01E-07
201	0.00	0.000	0.019	0.2909	0.3156	0.0000	3.01E-07
202	0.41	0.232	0.045	0.3044	0.3155	0.0000	3.00E-07
203	0.90	0.679	0.111	0.3157	0.3154	0.0000	3.00E-07
204	0.00	0.000	0.094	0.3063	0.3153	0.0000	3.00E-07
205	0.00	0.000	0.070	0.2993	0.3152	0.0000	3.00E-07
206	0.08	0.000	0.227	0.2849	0.3151	0.0000	3.00E-07
207	0.00	0.000	0.051	0.2799	0.3150	0.0000	3.00E-07
208	0.33	0.125	0.132	0.2876	0.3149	0.0000	3.00E-07
209	0.00	0.000	0.080	0.2796	0.3148	0.0000	3.00E-07
210	0.00	0.000	0.018	0.2778	0.3147	0.0000	3.00E-07
211	0.00	0.000	0.006	0.2772	0.3146	0.0000	3.00E-07
212	0.00	0.000	0.006	0.2770	0.3146	0.0000	3.00E-07
213	0.00	0.000	0.000	0.2770	0.3145	0.0000	3.00E-07
214	0.00	0.000	0.000	0.2770	0.3144	0.0000	3.00E-07
215	0.00	0.000	0.000	0.2770	0.3143	0.0000	2.99E-07
216	0.00	0.000	0.000	0.2770	0.3142	0.0000	2.99E-07

217	0.13	0.000	0.029	0.2874	0.3141	0.0000	2.99E-07
218	0.11	0.000	0.038	0.2949	0.3140	0.0000	2.99E-07
219	0.02	0.000	0.029	0.2944	0.3139	0.0000	2.99E-07
220	0.00	0.000	0.018	0.2927	0.3138	0.0000	2.99E-07
221	0.00	0.000	0.019	0.2908	0.3137	0.0000	2.99E-07
222	0.03	0.000	0.033	0.2905	0.3136	0.0000	2.99E-07
223	0.19	0.028	0.045	0.3020	0.3135	0.0000	2.99E-07
224	0.00	0.000	0.016	0.3004	0.3135	0.0000	2.99E-07
225	0.00	0.000	0.018	0.2986	0.3134	0.0000	2.99E-07
226	0.00	0.000	0.014	0.2972	0.3133	0.0000	2.99E-07
227	0.00	0.000	0.018	0.2957	0.3132	0.0000	2.98E-07
228	0.00	0.000	0.013	0.2945	0.3131	0.0000	2.98E-07
229	0.00	0.000	0.015	0.2930	0.3130	0.0000	2.98E-07
230	0.00	0.000	0.017	0.2913	0.3129	0.0000	2.98E-07
231	0.00	0.000	0.017	0.2896	0.3128	0.0000	2.98E-07
232	0.00	0.000	0.015	0.2881	0.3127	0.0000	2.98E-07
233	0.00	0.000	0.015	0.2866	0.3126	0.0000	2.98E-07
234	0.00	0.000	0.013	0.2853	0.3125	0.0000	2.98E-07
235	0.00	0.000	0.013	0.2842	0.3124	0.0000	2.98E-07
236	0.00	0.000	0.011	0.2830	0.3124	0.0000	2.98E-07
237	0.04	0.000	0.037	0.2836	0.3123	0.0000	2.98E-07
238	0.00	0.000	0.018	0.2822	0.3122	0.0000	2.98E-07
239	0.01	0.000	0.024	0.2810	0.3121	0.0000	2.98E-07
240	0.00	0.000	0.015	0.2794	0.3120	0.0000	2.97E-07
241	0.85	0.664	0.041	0.2941	0.3119	0.0000	2.97E-07
242	0.18	0.028	0.083	0.3012	0.3118	0.0000	2.97E-07
243	0.00	0.000	0.023	0.2989	0.3117	0.0000	2.97E-07
244	0.00	0.000	0.081	0.2908	0.3116	0.0000	2.97E-07
245	0.24	0.070	0.061	0.3016	0.3115	0.0000	2.97E-07
246	0.00	0.000	0.109	0.2907	0.3114	0.0000	2.97E-07
247	0.00	0.000	0.065	0.2842	0.3114	0.0000	2.97E-07
248	0.00	0.000	0.055	0.2787	0.3113	0.0000	2.97E-07

249	0.01	0.000	0.024	0.2774	0.3112	0.0000	2.97E-07
250	0.17	0.000	0.048	0.2891	0.3111	0.0000	2.97E-07
251	0.01	0.000	0.026	0.2878	0.3110	0.0000	2.97E-07
252	0.00	0.000	0.022	0.2856	0.3109	0.0000	2.96E-07
253	0.00	0.000	0.020	0.2836	0.3108	0.0000	2.96E-07
254	0.00	0.000	0.019	0.2817	0.3107	0.0000	2.96E-07
255	0.00	0.000	0.018	0.2799	0.3106	0.0000	2.96E-07
256	0.00	0.000	0.016	0.2783	0.3105	0.0000	2.96E-07
257	0.00	0.000	0.011	0.2773	0.3104	0.0000	2.96E-07
258	0.27	0.104	0.039	0.2897	0.3104	0.0000	2.96E-07
259	0.25	0.092	0.048	0.3008	0.3103	0.0000	2.96E-07
260	0.07	0.000	0.061	0.3016	0.3102	0.0000	2.96E-07
261	0.28	0.117	0.049	0.3131	0.3101	0.0000	2.96E-07
262	0.12	0.002	0.140	0.3112	0.3100	0.0000	2.96E-07
263	0.00	0.000	0.121	0.2991	0.3099	0.0000	2.96E-07
264	0.00	0.000	0.094	0.2897	0.3098	0.0000	2.96E-07
265	0.00	0.000	0.045	0.2852	0.3097	0.0000	2.95E-07
266	0.00	0.000	0.037	0.2815	0.3096	0.0000	2.95E-07
267	0.00	0.000	0.032	0.2782	0.3095	0.0000	2.95E-07
268	0.47	0.264	0.060	0.2930	0.3094	0.0000	2.95E-07
269	0.00	0.000	0.069	0.2861	0.3094	0.0000	2.95E-07
270	0.00	0.000	0.021	0.2840	0.3093	0.0000	2.95E-07
271	0.00	0.000	0.018	0.2823	0.3092	0.0000	2.95E-07
272	0.01	0.000	0.028	0.2807	0.3091	0.0000	2.95E-07
273	0.00	0.000	0.019	0.2788	0.3090	0.0000	2.95E-07
274	0.16	0.000	0.047	0.2900	0.3089	0.0000	2.95E-07
275	0.45	0.284	0.049	0.3021	0.3088	0.0000	2.95E-07
276	0.17	0.016	0.055	0.3115	0.3087	0.0000	2.95E-07
277	0.00	0.000	0.092	0.3024	0.3086	0.0000	2.95E-07
278	0.00	0.000	0.131	0.2892	0.3085	0.0000	2.94E-07
279	0.00	0.000	0.095	0.2798	0.3085	0.0000	2.94E-07
280	0.00	0.000	0.024	0.2773	0.3084	0.0000	2.94E-07

281		0.00	0.000	0.002	0.2771	0.3083	0.0000	2.94E-07
282		0.00	0.000	0.001	0.2770	0.3082	0.0000	2.94E-07
283		0.00	0.000	0.000	0.2770	0.3081	0.0000	2.94E-07
284		0.00	0.000	0.000	0.2770	0.3080	0.0000	2.94E-07
285		0.00	0.000	0.000	0.2770	0.3079	0.0000	2.94E-07
286		0.00	0.000	0.000	0.2770	0.3078	0.0000	2.94E-07
287		0.00	0.000	0.000	0.2770	0.3077	0.0000	2.94E-07
288		0.00	0.000	0.000	0.2770	0.3076	0.0000	2.94E-07
289		0.00	0.000	0.000	0.2770	0.3076	0.0000	2.94E-07
290		0.00	0.000	0.000	0.2770	0.3075	0.0000	2.94E-07
291		0.57	0.361	0.047	0.2932	0.3074	0.0000	2.93E-07
292		0.00	0.000	0.007	0.2924	0.3073	0.0000	2.93E-07
293		0.00	0.000	0.012	0.2913	0.3072	0.0000	2.93E-07
294		0.00	0.000	0.011	0.2902	0.3071	0.0000	2.93E-07
295		0.00	0.000	0.011	0.2891	0.3070	0.0000	2.93E-07
296		0.00	0.000	0.010	0.2881	0.3069	0.0000	2.93E-07
297		0.00	0.000	0.010	0.2870	0.3068	0.0000	2.93E-07
298	*	0.00	0.000	0.000	0.2871	0.3067	0.0000	2.93E-07
299		0.08	0.000	0.036	0.2910	0.3067	0.0000	2.93E-07
300		0.00	0.000	0.011	0.2899	0.3066	0.0000	2.93E-07
301		0.04	0.000	0.032	0.2903	0.3065	0.0000	2.93E-07
302		0.00	0.000	0.012	0.2890	0.3064	0.0000	2.93E-07
303		0.00	0.000	0.007	0.2883	0.3063	0.0000	2.92E-07
304		0.00	0.000	0.008	0.2875	0.3062	0.0000	2.92E-07
305		0.00	0.000	0.008	0.2866	0.3061	0.0000	2.92E-07
306		0.15	0.001	0.037	0.2977	0.3060	0.0000	2.92E-07
307		0.01	0.000	0.016	0.2973	0.3059	0.0000	2.92E-07
308		0.00	0.000	0.009	0.2964	0.3059	0.0000	2.92E-07
309	*	0.00	0.000	0.008	0.2956	0.3058	0.0000	2.92E-07
310		0.00	0.000	0.008	0.2948	0.3057	0.0000	2.92E-07
311		0.00	0.000	0.008	0.2940	0.3056	0.0000	2.92E-07
312		0.00	0.000	0.008	0.2932	0.3055	0.0000	2.92E-07

313		0.00	0.000	0.008	0.2924	0.3054	0.0000	2.92E-07
314	*	0.00	0.000	0.000	0.2924	0.3053	0.0000	2.92E-07
315		0.00	0.000	0.008	0.2917	0.3052	0.0000	2.92E-07
316		0.02	0.000	0.021	0.2914	0.3051	0.0000	2.91E-07
317		0.00	0.000	0.007	0.2907	0.3050	0.0000	2.91E-07
318		0.00	0.000	0.007	0.2899	0.3050	0.0000	2.91E-07
319		0.00	0.000	0.007	0.2892	0.3049	0.0000	2.91E-07
320		0.00	0.000	0.007	0.2885	0.3048	0.0000	2.91E-07
321		0.00	0.000	0.007	0.2878	0.3047	0.0000	2.91E-07
322		0.00	0.000	0.007	0.2872	0.3046	0.0000	2.91E-07
323		0.00	0.000	0.007	0.2865	0.3045	0.0000	2.91E-07
324	*	0.00	0.000	0.000	0.2865	0.3044	0.0000	2.91E-07
325	*	0.00	0.000	0.007	0.2858	0.3043	0.0000	2.91E-07
326		0.00	0.000	0.007	0.2852	0.3042	0.0000	2.91E-07
327		0.00	0.000	0.006	0.2845	0.3042	0.0000	2.91E-07
328		0.00	0.000	0.006	0.2839	0.3041	0.0000	2.91E-07
329		0.00	0.000	0.006	0.2833	0.3040	0.0000	2.90E-07
330	*	0.00	0.000	0.006	0.2826	0.3039	0.0000	2.90E-07
331		0.00	0.000	0.006	0.2820	0.3038	0.0000	2.90E-07
332		0.00	0.000	0.008	0.2813	0.3037	0.0000	2.90E-07
333		0.00	0.000	0.007	0.2805	0.3036	0.0000	2.90E-07
334	*	0.33	0.000	0.032	0.2825	0.3035	0.0000	2.90E-07
335		0.00	0.097	0.035	0.2968	0.3034	0.0000	2.90E-07
336	*	0.01	0.000	0.010	0.2968	0.3034	0.0000	2.90E-07
337		0.64	0.465	0.036	0.3108	0.3033	0.0000	2.90E-07
338		0.00	0.000	0.057	0.3051	0.3032	0.0000	2.90E-07
339		0.00	0.000	0.051	0.2999	0.3031	0.0000	2.90E-07
340		0.00	0.000	0.056	0.2943	0.3030	0.0000	2.90E-07
341		0.00	0.000	0.035	0.2908	0.3029	0.0000	2.90E-07
342	*	0.00	0.000	0.015	0.2893	0.3028	0.0000	2.89E-07
343	*	0.00	0.000	0.012	0.2881	0.3027	0.0000	2.89E-07
344	*	0.00	0.000	0.016	0.2866	0.3027	0.0000	2.89E-07

345		0.21	0.043	0.050	0.2979	0.3026	0.0000	2.89E-07
346	*	0.27	0.000	0.027	0.2999	0.3025	0.0000	2.89E-07
347		0.00	0.029	0.065	0.3126	0.3024	0.0000	2.89E-07
348		0.00	0.000	0.041	0.3085	0.3023	0.0000	2.89E-07
349		0.00	0.000	0.035	0.3050	0.3022	0.0000	2.89E-07
350	*	0.00	0.000	0.000	0.3050	0.3021	0.0000	2.89E-07
351	*	0.00	0.000	0.000	0.3050	0.3020	0.0000	2.89E-07
352	*	0.39	0.000	0.034	0.3070	0.3020	0.0000	2.89E-07
353		0.00	0.180	0.025	0.3198	0.3019	0.0000	2.89E-07
354	*	0.00	0.000	0.000	0.3198	0.3018	0.0000	2.89E-07
355		0.00	0.000	0.031	0.3167	0.3017	0.0000	2.88E-07
356		0.00	0.000	0.043	0.3124	0.3016	0.0000	2.88E-07
357		0.00	0.000	0.027	0.3097	0.3015	0.0000	2.88E-07
358	*	0.00	0.000	0.000	0.3097	0.3014	0.0000	2.88E-07
359		0.00	0.000	0.023	0.3074	0.3013	0.0000	2.88E-07
360	*	0.00	0.000	0.018	0.3056	0.3013	0.0000	2.88E-07
361		0.00	0.000	0.034	0.3022	0.3012	0.0000	2.88E-07
362		0.00	0.000	0.028	0.2994	0.3011	0.0000	2.88E-07
363		0.00	0.000	0.023	0.2971	0.3010	0.0000	2.88E-07
364		0.00	0.000	0.033	0.2937	0.3009	0.0000	2.88E-07
365		0.00	0.000	0.023	0.2914	0.3008	0.0000	2.88E-07

* = Frozen (air or soil)

Annual Totals for Year 18			
	inches	cubic feet	percent
Precipitation	30.15	109,433.6	100.00
Runoff	16.354	59,366.3	54.25
Evapotranspiration	13.887	50,410.9	46.07
Recirculation into Layer 1	0.0131	47.7	0.04
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0131	47.7	0.04
Percolation/Leakage through Layer 5	0.000110	0.4002	0.00
Average Head on Top of Layer 4	0.3173	---	---
Change in Water Storage	-0.0947	-343.9	-0.31
Soil Water at Start of Year	1,406.8011	5,106,688.2	4666.47
Soil Water at End of Year	1,406.7064	5,106,344.2	4666.16
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0131	-47.7	-0.04

Daily Output for Year 19

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.032	0.2883	0.3007	0.0000	2.88E-07
2			0.04	0.000	0.048	0.2871	0.3006	0.0000	2.88E-07
3	*		0.10	0.000	0.037	0.2891	0.3005	0.0000	2.87E-07
4			0.14	0.001	0.057	0.3016	0.3005	0.0000	2.87E-07
5			0.00	0.000	0.048	0.2969	0.3004	0.0000	2.87E-07
6			0.00	0.000	0.096	0.2873	0.3003	0.0000	2.87E-07
7			0.00	0.000	0.058	0.2815	0.3002	0.0000	2.87E-07
8			0.00	0.000	0.029	0.2785	0.3001	0.0000	2.87E-07
9			0.00	0.000	0.012	0.2774	0.3000	0.0000	2.87E-07
10			0.00	0.000	0.007	0.2771	0.2999	0.0000	2.87E-07
11			0.03	0.000	0.022	0.2781	0.2998	0.0000	2.87E-07
12			0.00	0.000	0.002	0.2779	0.2998	0.0000	2.87E-07
13			0.00	0.000	0.005	0.2774	0.2997	0.0000	2.87E-07
14			0.12	0.000	0.031	0.2859	0.2996	0.0000	2.87E-07
15			0.06	0.000	0.034	0.2885	0.2995	0.0000	2.87E-07
16			0.02	0.000	0.026	0.2878	0.2994	0.0000	2.86E-07
17			0.01	0.000	0.020	0.2865	0.2993	0.0000	2.86E-07
18			0.17	0.015	0.039	0.2985	0.2992	0.0000	2.86E-07
19			0.00	0.000	0.008	0.2976	0.2991	0.0000	2.86E-07
20			0.00	0.000	0.012	0.2964	0.2991	0.0000	2.86E-07
21			0.00	0.000	0.012	0.2953	0.2990	0.0000	2.86E-07
22			0.00	0.000	0.011	0.2942	0.2989	0.0000	2.86E-07
23			0.00	0.000	0.011	0.2931	0.2988	0.0000	2.86E-07
24			0.00	0.000	0.010	0.2921	0.2987	0.0000	2.86E-07

25		0.00	0.000	0.010	0.2911	0.2986	0.0000	2.86E-07
26		0.00	0.000	0.010	0.2901	0.2985	0.0000	2.86E-07
27		0.00	0.000	0.010	0.2891	0.2984	0.0000	2.86E-07
28		0.00	0.000	0.009	0.2882	0.2984	0.0000	2.86E-07
29		0.00	0.000	0.009	0.2872	0.2983	0.0000	2.85E-07
30		0.00	0.000	0.009	0.2863	0.2982	0.0000	2.85E-07
31	*	0.28	0.000	0.026	0.2883	0.2981	0.0000	2.85E-07
32	*	0.08	0.000	0.014	0.2903	0.2980	0.0000	2.85E-07
33	*	0.00	0.000	0.019	0.2923	0.2979	0.0000	2.85E-07
34	*	0.00	0.000	0.037	0.2942	0.2978	0.0000	2.85E-07
35		0.00	0.002	0.066	0.3063	0.2978	0.0000	2.85E-07
36		0.01	0.000	0.019	0.3057	0.2977	0.0000	2.85E-07
37		0.00	0.000	0.009	0.3048	0.2976	0.0000	2.85E-07
38		0.00	0.000	0.008	0.3040	0.2975	0.0000	2.85E-07
39		0.00	0.000	0.008	0.3031	0.2974	0.0000	2.85E-07
40	*	0.00	0.000	0.008	0.3023	0.2973	0.0000	2.85E-07
41		0.27	0.103	0.039	0.3156	0.2973	0.0000	2.85E-07
42	*	0.54	0.000	0.024	0.3176	0.2972	0.0000	2.85E-07
43		0.04	0.397	0.008	0.3302	0.2971	0.0000	2.84E-07
44		0.00	0.000	0.079	0.3224	0.2970	0.0000	2.84E-07
45		0.00	0.000	0.035	0.3189	0.2969	0.0000	2.84E-07
46		0.00	0.000	0.041	0.3148	0.2968	0.0000	2.84E-07
47		0.00	0.000	0.050	0.3098	0.2967	0.0000	2.84E-07
48	*	0.50	0.000	0.027	0.3118	0.2966	0.0000	2.84E-07
49		0.00	0.302	0.024	0.3249	0.2966	0.0000	2.84E-07
50		0.31	0.141	0.087	0.3329	0.2965	0.0000	2.84E-07
51		0.09	0.000	0.086	0.3328	0.2964	0.0000	2.84E-07
52		0.01	0.000	0.110	0.3224	0.2963	0.0000	2.84E-07
53		0.00	0.000	0.079	0.3145	0.2962	0.0000	2.84E-07
54		0.00	0.000	0.086	0.3059	0.2961	0.0000	2.84E-07
55		0.61	0.384	0.070	0.3217	0.2960	0.0000	2.84E-07
56	*	0.00	0.000	0.000	0.3217	0.2960	0.0000	2.83E-07

57	*	0.00	0.000	0.000	0.3217	0.2959	0.0000	2.83E-07
58		0.00	0.000	0.050	0.3168	0.2958	0.0000	2.83E-07
59	*	0.00	0.000	0.000	0.3168	0.2957	0.0000	2.83E-07
60	*	0.00	0.000	0.000	0.3168	0.2956	0.0000	2.83E-07
61		0.10	0.000	0.106	0.3163	0.2955	0.0000	2.83E-07
62		0.00	0.000	0.038	0.3125	0.2954	0.0000	2.83E-07
63		0.00	0.000	0.058	0.3067	0.2953	0.0000	2.83E-07
64		0.66	0.317	0.199	0.3212	0.2953	0.0000	2.83E-07
65		0.00	0.000	0.112	0.3100	0.2952	0.0000	2.83E-07
66		0.01	0.000	0.037	0.3071	0.2951	0.0000	2.83E-07
67	*	0.12	0.000	0.055	0.3091	0.2950	0.0000	2.83E-07
68	*	0.05	0.000	0.058	0.3110	0.2949	0.0000	2.83E-07
69	*	0.00	0.000	0.009	0.3111	0.2948	0.0000	2.82E-07
70	*	0.25	0.000	0.010	0.3130	0.2947	0.0000	2.82E-07
71		0.29	0.337	0.048	0.3258	0.2947	0.0000	2.82E-07
72	*	0.22	0.000	0.029	0.3277	0.2946	0.0000	2.82E-07
73		0.40	0.358	0.084	0.3404	0.2945	0.0000	2.82E-07
74		0.72	0.540	0.098	0.3483	0.2944	0.0000	2.82E-07
75		0.00	0.000	0.081	0.3402	0.2943	0.0000	2.82E-07
76		0.00	0.000	0.057	0.3345	0.2942	0.0000	2.82E-07
77		0.00	0.000	0.073	0.3273	0.2941	0.0000	2.82E-07
78		0.00	0.000	0.097	0.3176	0.2941	0.0000	2.82E-07
79		0.00	0.000	0.210	0.2966	0.2940	0.0000	2.82E-07
80		0.00	0.000	0.113	0.2853	0.2939	0.0000	2.82E-07
81		0.00	0.000	0.047	0.2806	0.2938	0.0000	2.82E-07
82		0.00	0.000	0.031	0.2775	0.2937	0.0000	2.81E-07
83		0.00	0.000	0.005	0.2770	0.2936	0.0000	2.81E-07
84		0.00	0.000	0.000	0.2770	0.2935	0.0000	2.81E-07
85		0.36	0.168	0.055	0.2904	0.2934	0.0000	2.81E-07
86		0.00	0.000	0.011	0.2893	0.2934	0.0000	2.81E-07
87		0.00	0.000	0.016	0.2877	0.2933	0.0000	2.81E-07
88		0.00	0.000	0.015	0.2862	0.2932	0.0000	2.81E-07

89		0.00	0.000	0.014	0.2847	0.2931	0.0000	2.81E-07
90	*	0.00	0.000	0.014	0.2834	0.2930	0.0000	2.81E-07
91		0.00	0.000	0.013	0.2821	0.2929	0.0000	2.81E-07
92		0.00	0.000	0.013	0.2808	0.2929	0.0000	2.81E-07
93		0.00	0.000	0.012	0.2796	0.2928	0.0000	2.81E-07
94		0.00	0.000	0.011	0.2785	0.2927	0.0000	2.81E-07
95		2.01	1.799	0.045	0.2948	0.2926	0.0000	2.81E-07
96		0.00	0.000	0.041	0.2908	0.2925	0.0000	2.80E-07
97		0.12	0.000	0.082	0.2946	0.2924	0.0000	2.80E-07
98		0.00	0.000	0.053	0.2893	0.2923	0.0000	2.80E-07
99		0.00	0.000	0.030	0.2862	0.2923	0.0000	2.80E-07
100	*	0.00	0.000	0.047	0.2815	0.2923	0.0000	2.80E-07
101		0.46	0.233	0.089	0.2957	0.2923	0.0000	2.80E-07
102		0.71	0.480	0.116	0.3073	0.2922	0.0000	2.80E-07
103		0.00	0.000	0.140	0.2933	0.2921	0.0000	2.80E-07
104		0.00	0.000	0.137	0.2796	0.2920	0.0000	2.80E-07
105		0.00	0.000	0.020	0.2776	0.2919	0.0000	2.80E-07
106		0.00	0.000	0.007	0.2771	0.2918	0.0000	2.80E-07
107		0.00	0.000	0.001	0.2770	0.2917	0.0000	2.80E-07
108		0.00	0.000	0.000	0.2770	0.2917	0.0000	2.80E-07
109		0.00	0.000	0.000	0.2770	0.2916	0.0000	2.80E-07
110		0.00	0.000	0.000	0.2770	0.2915	0.0000	2.80E-07
111		0.17	0.011	0.040	0.2894	0.2914	0.0000	2.79E-07
112		0.15	0.002	0.038	0.3002	0.2913	0.0000	2.79E-07
113		0.00	0.000	0.010	0.2991	0.2912	0.0000	2.79E-07
114		0.00	0.000	0.016	0.2975	0.2912	0.0000	2.79E-07
115		0.00	0.000	0.015	0.2960	0.2911	0.0000	2.79E-07
116		0.01	0.000	0.022	0.2947	0.2910	0.0000	2.79E-07
117		0.00	0.000	0.014	0.2933	0.2909	0.0000	2.79E-07
118		0.00	0.000	0.014	0.2920	0.2908	0.0000	2.79E-07
119		0.00	0.000	0.013	0.2907	0.2907	0.0000	2.79E-07
120		0.00	0.000	0.013	0.2894	0.2906	0.0000	2.79E-07

121	0.00	0.000	0.013	0.2881	0.2906	0.0000	2.79E-07
122	0.00	0.000	0.015	0.2870	0.2905	0.0000	2.79E-07
123	0.00	0.000	0.012	0.2858	0.2904	0.0000	2.79E-07
124	0.00	0.000	0.014	0.2844	0.2903	0.0000	2.79E-07
125	0.00	0.000	0.014	0.2830	0.2902	0.0000	2.78E-07
126	0.00	0.000	0.014	0.2816	0.2901	0.0000	2.78E-07
127	0.00	0.000	0.014	0.2803	0.2901	0.0000	2.78E-07
128	0.09	0.000	0.040	0.2851	0.2900	0.0000	2.78E-07
129	0.03	0.000	0.032	0.2849	0.2899	0.0000	2.78E-07
130	0.00	0.000	0.012	0.2837	0.2898	0.0000	2.78E-07
131	0.00	0.000	0.007	0.2830	0.2897	0.0000	2.78E-07
132	0.68	0.496	0.042	0.2971	0.2896	0.0000	2.78E-07
133	0.07	0.000	0.100	0.2936	0.2895	0.0000	2.78E-07
134	0.21	0.056	0.038	0.3055	0.2895	0.0000	2.78E-07
135	0.01	0.000	0.104	0.2965	0.2894	0.0000	2.78E-07
136	0.01	0.000	0.019	0.2955	0.2893	0.0000	2.78E-07
137	0.00	0.000	0.010	0.2945	0.2892	0.0000	2.78E-07
138	0.00	0.000	0.011	0.2934	0.2891	0.0000	2.77E-07
139	0.00	0.000	0.010	0.2924	0.2890	0.0000	2.77E-07
140	0.00	0.000	0.009	0.2915	0.2890	0.0000	2.77E-07
141	0.00	0.000	0.010	0.2905	0.2889	0.0000	2.77E-07
142	0.00	0.000	0.011	0.2894	0.2888	0.0000	2.77E-07
143	0.44	0.252	0.044	0.3040	0.2887	0.0000	2.77E-07
144	0.01	0.000	0.139	0.2909	0.2886	0.0000	2.77E-07
145	0.04	0.000	0.160	0.2792	0.2885	0.0000	2.77E-07
146	0.00	0.000	0.018	0.2775	0.2885	0.0000	2.77E-07
147	0.05	0.000	0.032	0.2790	0.2884	0.0000	2.77E-07
148	0.11	0.000	0.033	0.2872	0.2883	0.0000	2.77E-07
149	1.70	1.510	0.066	0.3001	0.2882	0.0000	2.77E-07
150	0.08	0.000	0.054	0.3026	0.2881	0.0000	2.77E-07
151	0.00	0.000	0.127	0.2899	0.2880	0.0000	2.77E-07
152	0.06	0.000	0.154	0.2805	0.2879	0.0000	2.76E-07

153	0.00	0.000	0.024	0.2781	0.2879	0.0000	2.76E-07
154	0.00	0.000	0.008	0.2773	0.2878	0.0000	2.76E-07
155	0.00	0.000	0.002	0.2771	0.2877	0.0000	2.76E-07
156	0.00	0.000	0.001	0.2770	0.2876	0.0000	2.76E-07
157	0.00	0.000	0.000	0.2770	0.2875	0.0000	2.76E-07
158	0.00	0.000	0.005	0.2770	0.2874	0.0000	2.76E-07
159	0.00	0.000	0.000	0.2770	0.2874	0.0000	2.76E-07
160	0.02	0.000	0.018	0.2774	0.2873	0.0000	2.76E-07
161	0.91	0.699	0.054	0.2930	0.2872	0.0000	2.76E-07
162	0.01	0.000	0.019	0.2918	0.2871	0.0000	2.76E-07
163	1.17	0.979	0.052	0.3062	0.2870	0.0000	2.76E-07
164	0.00	0.000	0.158	0.2904	0.2869	0.0000	2.76E-07
165	0.71	0.442	0.124	0.3052	0.2869	0.0000	2.75E-07
166	0.04	0.000	0.081	0.3008	0.2868	0.0000	2.75E-07
167	0.00	0.000	0.089	0.2919	0.2867	0.0000	2.75E-07
168	0.00	0.000	0.099	0.2820	0.2866	0.0000	2.75E-07
169	0.00	0.000	0.043	0.2777	0.2865	0.0000	2.75E-07
170	0.00	0.000	0.005	0.2772	0.2864	0.0000	2.75E-07
171	1.26	1.018	0.088	0.2930	0.2864	0.0000	2.75E-07
172	0.37	0.124	0.192	0.2980	0.2863	0.0000	2.75E-07
173	0.00	0.000	0.060	0.2920	0.2862	0.0000	2.75E-07
174	1.10	0.731	0.238	0.3055	0.2861	0.0000	2.75E-07
175	0.00	0.000	0.120	0.2935	0.2860	0.0000	2.75E-07
176	0.35	0.115	0.153	0.3017	0.2859	0.0000	2.75E-07
177	2.37	2.098	0.163	0.3127	0.2859	0.0000	2.75E-07
178	0.16	0.009	0.233	0.3042	0.2858	0.0000	2.75E-07
179	0.00	0.000	0.153	0.2889	0.2857	0.0000	2.74E-07
180	0.05	0.000	0.093	0.2844	0.2856	0.0000	2.74E-07
181	0.00	0.000	0.058	0.2791	0.2855	0.0000	2.74E-07
182	0.00	0.000	0.015	0.2776	0.2854	0.0000	2.74E-07
183	0.00	0.000	0.005	0.2771	0.2854	0.0000	2.74E-07
184	0.00	0.000	0.001	0.2770	0.2853	0.0000	2.74E-07

185	0.00	0.000	0.000	0.2770	0.2852	0.0000	2.74E-07
186	0.00	0.000	0.000	0.2770	0.2851	0.0000	2.74E-07
187	0.00	0.000	0.000	0.2770	0.2850	0.0000	2.74E-07
188	0.00	0.000	0.002	0.2770	0.2849	0.0000	2.74E-07
189	0.07	0.000	0.030	0.2814	0.2849	0.0000	2.74E-07
190	0.41	0.234	0.059	0.2933	0.2848	0.0000	2.74E-07
191	0.11	0.000	0.041	0.3005	0.2847	0.0000	2.74E-07
192	0.76	0.573	0.052	0.3137	0.2846	0.0000	2.74E-07
193	0.00	0.000	0.067	0.3071	0.2845	0.0000	2.73E-07
194	0.70	0.440	0.112	0.3220	0.2844	0.0000	2.73E-07
195	0.00	0.000	0.089	0.3131	0.2844	0.0000	2.73E-07
196	0.01	0.000	0.098	0.3048	0.2843	0.0000	2.73E-07
197	0.01	0.000	0.064	0.2990	0.2842	0.0000	2.73E-07
198	0.00	0.000	0.128	0.2862	0.2841	0.0000	2.73E-07
199	0.13	0.000	0.118	0.2876	0.2840	0.0000	2.73E-07
200	0.00	0.000	0.041	0.2835	0.2839	0.0000	2.73E-07
201	0.00	0.000	0.044	0.2791	0.2839	0.0000	2.73E-07
202	0.92	0.697	0.072	0.2941	0.2838	0.0000	2.73E-07
203	0.12	0.000	0.139	0.2918	0.2837	0.0000	2.73E-07
204	0.89	0.472	0.301	0.3038	0.2836	0.0000	2.73E-07
205	0.00	0.000	0.108	0.2932	0.2835	0.0000	2.73E-07
206	0.07	0.000	0.171	0.2827	0.2834	0.0000	2.72E-07
207	0.25	0.074	0.123	0.2879	0.2834	0.0000	2.72E-07
208	0.03	0.000	0.053	0.2858	0.2833	0.0000	2.72E-07
209	0.00	0.000	0.040	0.2818	0.2832	0.0000	2.72E-07
210	0.27	0.100	0.064	0.2928	0.2831	0.0000	2.72E-07
211	0.01	0.000	0.109	0.2828	0.2830	0.0000	2.72E-07
212	0.00	0.000	0.027	0.2802	0.2829	0.0000	2.72E-07
213	0.89	0.673	0.074	0.2950	0.2829	0.0000	2.72E-07
214	0.00	0.000	0.070	0.2880	0.2828	0.0000	2.72E-07
215	0.00	0.000	0.077	0.2803	0.2827	0.0000	2.72E-07
216	0.00	0.000	0.025	0.2778	0.2826	0.0000	2.72E-07

217	0.00	0.000	0.007	0.2771	0.2825	0.0000	2.72E-07
218	0.00	0.000	0.001	0.2770	0.2824	0.0000	2.72E-07
219	0.00	0.000	0.000	0.2770	0.2824	0.0000	2.72E-07
220	0.00	0.000	0.000	0.2770	0.2823	0.0000	2.71E-07
221	0.00	0.000	0.004	0.2770	0.2822	0.0000	2.71E-07
222	0.00	0.000	0.000	0.2770	0.2821	0.0000	2.71E-07
223	0.00	0.000	0.000	0.2770	0.2820	0.0000	2.71E-07
224	0.00	0.000	0.000	0.2770	0.2820	0.0000	2.71E-07
225	0.00	0.000	0.000	0.2770	0.2819	0.0000	2.71E-07
226	0.00	0.000	0.000	0.2770	0.2818	0.0000	2.71E-07
227	0.00	0.000	0.000	0.2770	0.2817	0.0000	2.71E-07
228	0.00	0.000	0.000	0.2770	0.2816	0.0000	2.71E-07
229	0.00	0.000	0.000	0.2770	0.2815	0.0000	2.71E-07
230	0.00	0.000	0.000	0.2770	0.2815	0.0000	2.71E-07
231	0.02	0.000	0.018	0.2773	0.2814	0.0000	2.71E-07
232	0.02	0.000	0.016	0.2775	0.2813	0.0000	2.71E-07
233	0.15	0.000	0.038	0.2891	0.2812	0.0000	2.71E-07
234	0.04	0.000	0.037	0.2891	0.2811	0.0000	2.70E-07
235	0.00	0.000	0.016	0.2875	0.2811	0.0000	2.70E-07
236	0.00	0.000	0.019	0.2856	0.2810	0.0000	2.70E-07
237	0.00	0.000	0.021	0.2835	0.2809	0.0000	2.70E-07
238	0.00	0.000	0.017	0.2818	0.2808	0.0000	2.70E-07
239	0.00	0.000	0.020	0.2798	0.2807	0.0000	2.70E-07
240	0.00	0.000	0.019	0.2779	0.2806	0.0000	2.70E-07
241	0.08	0.000	0.037	0.2818	0.2806	0.0000	2.70E-07
242	0.00	0.000	0.014	0.2804	0.2805	0.0000	2.70E-07
243	0.00	0.000	0.013	0.2792	0.2804	0.0000	2.70E-07
244	0.01	0.000	0.011	0.2787	0.2803	0.0000	2.70E-07
245	0.53	0.337	0.047	0.2932	0.2802	0.0000	2.70E-07
246	1.17	1.008	0.048	0.3044	0.2802	0.0000	2.70E-07
247	0.65	0.385	0.154	0.3153	0.2801	0.0000	2.70E-07
248	0.00	0.000	0.067	0.3086	0.2800	0.0000	2.69E-07

249	0.00	0.000	0.058	0.3028	0.2799	0.0000	2.69E-07
250	0.00	0.000	0.097	0.2931	0.2798	0.0000	2.69E-07
251	0.00	0.000	0.142	0.2789	0.2797	0.0000	2.69E-07
252	0.00	0.000	0.016	0.2773	0.2797	0.0000	2.69E-07
253	0.00	0.000	0.002	0.2771	0.2796	0.0000	2.69E-07
254	0.00	0.000	0.001	0.2770	0.2795	0.0000	2.69E-07
255	0.82	0.591	0.069	0.2930	0.2794	0.0000	2.69E-07
256	0.00	0.000	0.109	0.2821	0.2793	0.0000	2.69E-07
257	0.00	0.000	0.028	0.2793	0.2793	0.0000	2.69E-07
258	0.00	0.000	0.019	0.2774	0.2792	0.0000	2.69E-07
259	0.00	0.000	0.003	0.2771	0.2791	0.0000	2.69E-07
260	0.00	0.000	0.001	0.2770	0.2790	0.0000	2.69E-07
261	0.00	0.000	0.000	0.2770	0.2789	0.0000	2.69E-07
262	0.00	0.000	0.000	0.2770	0.2788	0.0000	2.68E-07
263	0.03	0.000	0.022	0.2780	0.2788	0.0000	2.68E-07
264	0.02	0.000	0.015	0.2782	0.2787	0.0000	2.68E-07
265	0.71	0.511	0.050	0.2932	0.2786	0.0000	2.68E-07
266	0.00	0.000	0.041	0.2892	0.2785	0.0000	2.68E-07
267	0.00	0.000	0.030	0.2862	0.2784	0.0000	2.68E-07
268	0.03	0.000	0.058	0.2832	0.2784	0.0000	2.68E-07
269	0.00	0.000	0.054	0.2778	0.2783	0.0000	2.68E-07
270	0.00	0.000	0.007	0.2772	0.2782	0.0000	2.68E-07
271	0.10	0.000	0.035	0.2833	0.2781	0.0000	2.68E-07
272	1.14	0.946	0.067	0.2963	0.2780	0.0000	2.68E-07
273	0.01	0.000	0.040	0.2936	0.2780	0.0000	2.68E-07
274	0.04	0.000	0.078	0.2897	0.2779	0.0000	2.68E-07
275	0.06	0.000	0.139	0.2821	0.2778	0.0000	2.68E-07
276	0.99	0.763	0.097	0.2951	0.2777	0.0000	2.67E-07
277	0.31	0.102	0.160	0.2997	0.2776	0.0000	2.67E-07
278	0.00	0.000	0.056	0.2941	0.2775	0.0000	2.67E-07
279	0.00	0.000	0.088	0.2853	0.2775	0.0000	2.67E-07
280	0.00	0.000	0.065	0.2788	0.2774	0.0000	2.67E-07

281		0.00	0.000	0.014	0.2775	0.2773	0.0000	2.67E-07
282		0.13	0.000	0.038	0.2871	0.2772	0.0000	2.67E-07
283		1.96	1.757	0.072	0.3003	0.2771	0.0000	2.67E-07
284		0.23	0.073	0.098	0.3065	0.2771	0.0000	2.67E-07
285		0.00	0.000	0.088	0.2977	0.2770	0.0000	2.67E-07
286		0.00	0.000	0.078	0.2899	0.2769	0.0000	2.67E-07
287		0.00	0.000	0.088	0.2810	0.2768	0.0000	2.67E-07
288		0.00	0.000	0.035	0.2775	0.2767	0.0000	2.67E-07
289		0.00	0.000	0.004	0.2771	0.2767	0.0000	2.67E-07
290		0.00	0.000	0.001	0.2770	0.2766	0.0000	2.66E-07
291		0.00	0.000	0.000	0.2770	0.2765	0.0000	2.66E-07
292		0.00	0.000	0.000	0.2770	0.2764	0.0000	2.66E-07
293		0.00	0.000	0.000	0.2770	0.2763	0.0000	2.66E-07
294		0.00	0.000	0.000	0.2770	0.2763	0.0000	2.66E-07
295	*	0.00	0.000	0.000	0.2770	0.2762	0.0000	2.66E-07
296	*	0.00	0.000	0.000	0.2770	0.2761	0.0000	2.66E-07
297		0.00	0.000	0.000	0.2770	0.2760	0.0000	2.66E-07
298	*	0.00	0.000	0.000	0.2770	0.2759	0.0000	2.66E-07
299		0.00	0.000	0.000	0.2770	0.2759	0.0000	2.66E-07
300		0.00	0.000	0.000	0.2770	0.2758	0.0000	2.66E-07
301		0.00	0.000	0.000	0.2770	0.2757	0.0000	2.66E-07
302		0.00	0.000	0.000	0.2770	0.2756	0.0000	2.66E-07
303		0.00	0.000	0.000	0.2770	0.2755	0.0000	2.66E-07
304	*	0.00	0.000	0.000	0.2770	0.2755	0.0000	2.65E-07
305	*	0.00	0.000	0.000	0.2770	0.2754	0.0000	2.65E-07
306		0.02	0.000	0.014	0.2772	0.2753	0.0000	2.65E-07
307		0.02	0.000	0.015	0.2775	0.2752	0.0000	2.65E-07
308	*	0.00	0.000	0.000	0.2775	0.2751	0.0000	2.65E-07
309	*	0.05	0.000	0.016	0.2795	0.2751	0.0000	2.65E-07
310	*	0.00	0.000	0.015	0.2795	0.2750	0.0000	2.65E-07
311	*	0.00	0.000	0.003	0.2792	0.2749	0.0000	2.65E-07
312	*	0.77	0.000	0.017	0.2811	0.2748	0.0000	2.65E-07

313	*		0.03	0.000	0.000	0.2831	0.2747	0.0000	2.65E-07
314	*		0.00	0.000	0.023	0.2851	0.2747	0.0000	2.65E-07
315	*		0.00	0.000	0.015	0.2871	0.2746	0.0000	2.65E-07
316	*		0.00	0.000	0.008	0.2890	0.2745	0.0000	2.65E-07
317	*	*	0.00	0.000	0.015	0.2890	0.2744	0.0000	2.65E-07
318	*	*	0.00	0.000	0.022	0.2890	0.2743	0.0000	2.64E-07
319	*	*	0.00	0.000	0.012	0.2890	0.2743	0.0000	2.64E-07
320	*	*	0.00	0.000	0.016	0.2890	0.2742	0.0000	2.64E-07
321	*	*	0.00	0.000	0.000	0.2890	0.2741	0.0000	2.64E-07
322		*	0.00	0.534	0.000	0.2902	0.2740	0.0000	2.64E-07
323		*	0.01	0.000	0.043	0.2902	0.2739	0.0000	2.64E-07
324			0.02	0.000	0.022	0.2901	0.2739	0.0000	2.64E-07
325			0.00	0.000	0.010	0.2891	0.2738	0.0000	2.64E-07
326			0.00	0.000	0.010	0.2881	0.2737	0.0000	2.64E-07
327			0.00	0.000	0.010	0.2871	0.2736	0.0000	2.64E-07
328			0.00	0.000	0.009	0.2862	0.2735	0.0000	2.64E-07
329			0.00	0.000	0.009	0.2853	0.2735	0.0000	2.64E-07
330			0.29	0.112	0.043	0.2992	0.2734	0.0000	2.64E-07
331			0.00	0.000	0.009	0.2983	0.2733	0.0000	2.64E-07
332			0.00	0.000	0.009	0.2973	0.2732	0.0000	2.64E-07
333			0.00	0.000	0.009	0.2965	0.2731	0.0000	2.63E-07
334			0.00	0.000	0.008	0.2956	0.2731	0.0000	2.63E-07
335			0.00	0.000	0.008	0.2948	0.2730	0.0000	2.63E-07
336			0.12	0.000	0.037	0.3036	0.2729	0.0000	2.63E-07
337	*		0.02	0.000	0.034	0.3017	0.2728	0.0000	2.63E-07
338	*		0.14	0.000	0.029	0.3037	0.2727	0.0000	2.63E-07
339	*		0.00	0.000	0.035	0.3056	0.2727	0.0000	2.63E-07
340	*		0.00	0.000	0.038	0.3057	0.2726	0.0000	2.63E-07
341	*		0.00	0.000	0.000	0.3057	0.2725	0.0000	2.63E-07
342	*		0.00	0.000	0.000	0.3057	0.2724	0.0000	2.63E-07
343			0.00	0.000	0.021	0.3036	0.2723	0.0000	2.63E-07
344	*		0.00	0.000	0.000	0.3036	0.2723	0.0000	2.63E-07

345	*	0.00	0.000	0.008	0.3028	0.2722	0.0000	2.63E-07
346		0.00	0.000	0.008	0.3020	0.2721	0.0000	2.63E-07
347		0.11	0.000	0.036	0.3091	0.2720	0.0000	2.62E-07
348		0.00	0.000	0.036	0.3055	0.2719	0.0000	2.62E-07
349	*	0.00	0.000	0.008	0.3047	0.2719	0.0000	2.62E-07
350	*	0.02	0.000	0.029	0.3039	0.2718	0.0000	2.62E-07
351		0.05	0.000	0.031	0.3054	0.2717	0.0000	2.62E-07
352		0.42	0.249	0.040	0.3181	0.2716	0.0000	2.62E-07
353	*	0.00	0.000	0.000	0.3181	0.2715	0.0000	2.62E-07
354		0.43	0.250	0.053	0.3312	0.2715	0.0000	2.62E-07
355		0.06	0.000	0.068	0.3307	0.2714	0.0000	2.62E-07
356		0.39	0.210	0.054	0.3430	0.2713	0.0000	2.62E-07
357	*	0.00	0.000	0.003	0.3430	0.2712	0.0000	2.62E-07
358	*	0.00	0.000	0.000	0.3430	0.2711	0.0000	2.62E-07
359	*	0.00	0.000	0.000	0.3430	0.2711	0.0000	2.62E-07
360		0.00	0.000	0.029	0.3401	0.2710	0.0000	2.62E-07
361		0.00	0.000	0.027	0.3374	0.2709	0.0000	2.61E-07
362		0.00	0.000	0.033	0.3342	0.2708	0.0000	2.61E-07
363		0.00	0.000	0.036	0.3309	0.2708	0.0000	2.61E-07
364		0.02	0.000	0.043	0.3289	0.2707	0.0000	2.61E-07
365		0.04	0.000	0.052	0.3279	0.2706	0.0000	2.61E-07

* = Frozen (air or soil)

Annual Totals for Year 19			
	inches	cubic feet	percent
Precipitation	40.33	146,385.5	100.00
Runoff	25.211	91,515.1	62.52
Evapotranspiration	14.761	53,582.7	36.60
Recirculation into Layer 1	0.0118	42.9	0.03
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0118	42.9	0.03
Percolation/Leakage through Layer 5	0.000100	0.3634	0.00
Average Head on Top of Layer 4	0.2854	---	---
Change in Water Storage	0.3547	1,287.4	0.88
Soil Water at Start of Year	1,406.7064	5,106,344.2	3488.28
Soil Water at End of Year	1,407.0611	5,107,631.7	3489.16
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0118	-42.9	-0.03

Daily Output for Year 20

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.028	0.3251	0.2705	0.0000	2.61E-07
2	*		0.00	0.000	0.000	0.3251	0.2704	0.0000	2.61E-07
3	*		0.74	0.000	0.013	0.3271	0.2704	0.0000	2.61E-07
4	*		0.00	0.000	0.016	0.3291	0.2703	0.0000	2.61E-07
5	*	*	0.29	0.000	0.018	0.3291	0.2702	0.0000	2.61E-07
6		*	0.04	0.322	0.000	0.3302	0.2701	0.0000	2.61E-07
7		*	0.14	0.795	0.000	0.3302	0.2700	0.0000	2.61E-07
8			0.00	0.000	0.054	0.3248	0.2700	0.0000	2.61E-07
9			0.00	0.000	0.134	0.3113	0.2699	0.0000	2.61E-07
10			0.00	0.000	0.047	0.3066	0.2699	0.0000	2.61E-07
11			0.00	0.000	0.053	0.3013	0.2698	0.0000	2.60E-07
12			0.00	0.000	0.027	0.2986	0.2697	0.0000	2.60E-07
13	*		0.00	0.000	0.000	0.2986	0.2696	0.0000	2.60E-07
14	*		0.00	0.000	0.000	0.2986	0.2695	0.0000	2.60E-07
15	*		0.00	0.000	0.000	0.2986	0.2695	0.0000	2.60E-07
16	*		0.09	0.000	0.021	0.3006	0.2694	0.0000	2.60E-07
17			0.00	0.000	0.058	0.2996	0.2693	0.0000	2.60E-07
18			0.00	0.000	0.034	0.2961	0.2692	0.0000	2.60E-07
19			0.00	0.000	0.039	0.2922	0.2691	0.0000	2.60E-07
20			0.00	0.000	0.050	0.2873	0.2691	0.0000	2.60E-07
21			0.00	0.000	0.044	0.2829	0.2690	0.0000	2.60E-07
22	*		0.00	0.000	0.021	0.2808	0.2689	0.0000	2.60E-07
23			0.00	0.000	0.031	0.2777	0.2688	0.0000	2.60E-07
24			0.00	0.000	0.007	0.2770	0.2688	0.0000	2.60E-07

25		0.00	0.000	0.000	0.2770	0.2687	0.0000	2.60E-07
26		0.00	0.000	0.000	0.2770	0.2686	0.0000	2.59E-07
27		0.00	0.000	0.000	0.2770	0.2685	0.0000	2.59E-07
28	*	0.02	0.000	0.016	0.2770	0.2684	0.0000	2.59E-07
29		0.00	0.000	0.000	0.2770	0.2684	0.0000	2.59E-07
30		0.00	0.000	0.000	0.2770	0.2683	0.0000	2.59E-07
31		0.00	0.000	0.000	0.2770	0.2682	0.0000	2.59E-07
32	*	0.00	0.000	0.000	0.2770	0.2681	0.0000	2.59E-07
33		0.30	0.130	0.042	0.2897	0.2681	0.0000	2.59E-07
34		0.00	0.000	0.008	0.2888	0.2680	0.0000	2.59E-07
35		0.73	0.534	0.049	0.3034	0.2679	0.0000	2.59E-07
36		0.02	0.000	0.088	0.2969	0.2678	0.0000	2.59E-07
37		0.00	0.000	0.040	0.2934	0.2677	0.0000	2.59E-07
38		0.00	0.000	0.044	0.2890	0.2677	0.0000	2.59E-07
39		0.00	0.000	0.029	0.2860	0.2676	0.0000	2.59E-07
40		0.01	0.000	0.046	0.2825	0.2675	0.0000	2.58E-07
41	*	0.08	0.000	0.034	0.2844	0.2674	0.0000	2.58E-07
42	*	0.02	0.000	0.029	0.2858	0.2673	0.0000	2.58E-07
43	*	0.00	0.000	0.000	0.2858	0.2673	0.0000	2.58E-07
44		0.00	0.000	0.037	0.2822	0.2672	0.0000	2.58E-07
45	*	0.00	0.000	0.000	0.2822	0.2671	0.0000	2.58E-07
46	*	0.00	0.000	0.000	0.2822	0.2670	0.0000	2.58E-07
47		0.00	0.000	0.027	0.2796	0.2670	0.0000	2.58E-07
48		0.12	0.000	0.045	0.2876	0.2669	0.0000	2.58E-07
49		0.01	0.000	0.021	0.2860	0.2668	0.0000	2.58E-07
50		0.43	0.231	0.057	0.3000	0.2667	0.0000	2.58E-07
51		0.74	0.525	0.097	0.3116	0.2666	0.0000	2.58E-07
52		0.05	0.000	0.068	0.3099	0.2666	0.0000	2.58E-07
53		0.00	0.000	0.088	0.3015	0.2665	0.0000	2.58E-07
54		0.12	0.000	0.054	0.3086	0.2664	0.0000	2.58E-07
55		0.00	0.000	0.049	0.3037	0.2663	0.0000	2.57E-07
56	*	0.00	0.000	0.000	0.3037	0.2663	0.0000	2.57E-07

57	*	0.00	0.000	0.017	0.3020	0.2662	0.0000	2.57E-07
58		0.48	0.276	0.058	0.3162	0.2661	0.0000	2.57E-07
59	*	0.00	0.000	0.000	0.3162	0.2660	0.0000	2.57E-07
60		0.00	0.000	0.058	0.3104	0.2659	0.0000	2.57E-07
61		0.00	0.000	0.057	0.3048	0.2659	0.0000	2.57E-07
62		0.00	0.000	0.061	0.2986	0.2658	0.0000	2.57E-07
63		0.00	0.000	0.038	0.2948	0.2657	0.0000	2.57E-07
64		0.00	0.000	0.048	0.2900	0.2656	0.0000	2.57E-07
65		0.00	0.000	0.049	0.2851	0.2656	0.0000	2.57E-07
66		0.00	0.000	0.066	0.2785	0.2655	0.0000	2.57E-07
67		0.00	0.000	0.013	0.2772	0.2654	0.0000	2.57E-07
68		0.00	0.000	0.002	0.2770	0.2653	0.0000	2.57E-07
69		0.00	0.000	0.000	0.2770	0.2653	0.0000	2.57E-07
70	*	0.00	0.000	0.000	0.2770	0.2652	0.0000	2.56E-07
71		0.00	0.000	0.000	0.2770	0.2651	0.0000	2.56E-07
72		0.00	0.000	0.000	0.2770	0.2650	0.0000	2.56E-07
73		0.07	0.000	0.029	0.2807	0.2650	0.0000	2.56E-07
74		0.98	0.794	0.057	0.2933	0.2649	0.0000	2.56E-07
75		0.11	0.000	0.114	0.2926	0.2648	0.0000	2.56E-07
76		0.00	0.000	0.032	0.2893	0.2647	0.0000	2.56E-07
77		0.00	0.000	0.025	0.2868	0.2646	0.0000	2.56E-07
78		0.00	0.000	0.025	0.2845	0.2646	0.0000	2.56E-07
79		2.29	2.078	0.063	0.2999	0.2645	0.0000	2.56E-07
80		0.00	0.000	0.039	0.2961	0.2644	0.0000	2.56E-07
81		0.00	0.000	0.061	0.2903	0.2643	0.0000	2.56E-07
82		0.00	0.000	0.025	0.2878	0.2643	0.0000	2.56E-07
83	*	0.00	0.000	0.019	0.2858	0.2642	0.0000	2.56E-07
84	*	0.00	0.000	0.041	0.2817	0.2641	0.0000	2.55E-07
85	*	0.04	0.000	0.027	0.2826	0.2640	0.0000	2.55E-07
86	*	0.00	0.000	0.000	0.2826	0.2640	0.0000	2.55E-07
87		0.00	0.000	0.046	0.2779	0.2639	0.0000	2.55E-07
88		0.08	0.000	0.048	0.2815	0.2638	0.0000	2.55E-07

89		0.00	0.000	0.019	0.2796	0.2637	0.0000	2.55E-07
90		0.00	0.000	0.020	0.2776	0.2636	0.0000	2.55E-07
91		0.00	0.000	0.005	0.2772	0.2636	0.0000	2.55E-07
92		0.00	0.000	0.001	0.2770	0.2635	0.0000	2.55E-07
93		0.00	0.000	0.000	0.2770	0.2634	0.0000	2.55E-07
94	*	0.00	0.000	0.000	0.2770	0.2633	0.0000	2.55E-07
95		0.00	0.000	0.000	0.2770	0.2633	0.0000	2.55E-07
96		0.00	0.000	0.000	0.2770	0.2632	0.0000	2.55E-07
97		0.00	0.000	0.000	0.2770	0.2631	0.0000	2.55E-07
98		0.94	0.723	0.052	0.2933	0.2630	0.0000	2.55E-07
99		0.41	0.203	0.093	0.3049	0.2630	0.0000	2.54E-07
100		0.00	0.000	0.105	0.2944	0.2629	0.0000	2.54E-07
101		0.00	0.000	0.102	0.2842	0.2628	0.0000	2.54E-07
102		0.00	0.000	0.060	0.2782	0.2627	0.0000	2.54E-07
103		0.00	0.000	0.009	0.2773	0.2626	0.0000	2.54E-07
104		0.00	0.000	0.002	0.2771	0.2626	0.0000	2.54E-07
105		0.00	0.000	0.001	0.2770	0.2625	0.0000	2.54E-07
106		0.00	0.000	0.000	0.2770	0.2624	0.0000	2.54E-07
107		0.00	0.000	0.000	0.2770	0.2623	0.0000	2.54E-07
108		0.34	0.149	0.055	0.2904	0.2623	0.0000	2.54E-07
109		0.00	0.000	0.011	0.2894	0.2622	0.0000	2.54E-07
110	*	0.00	0.000	0.000	0.2894	0.2621	0.0000	2.54E-07
111	*	0.23	0.000	0.042	0.2914	0.2620	0.0000	2.54E-07
112	*	0.00	0.000	0.035	0.2933	0.2620	0.0000	2.54E-07
113	*	0.00	0.000	0.088	0.2953	0.2619	0.0000	2.54E-07
114	*	0.08	0.000	0.067	0.2966	0.2618	0.0000	2.53E-07
115	*	0.02	0.000	0.024	0.2966	0.2617	0.0000	2.53E-07
116	*	0.00	0.000	0.015	0.2951	0.2617	0.0000	2.53E-07
117		0.00	0.000	0.014	0.2937	0.2616	0.0000	2.53E-07
118		0.00	0.000	0.014	0.2923	0.2615	0.0000	2.53E-07
119		0.00	0.000	0.013	0.2910	0.2614	0.0000	2.53E-07
120		0.00	0.000	0.013	0.2898	0.2613	0.0000	2.53E-07

121		0.02	0.000	0.029	0.2893	0.2613	0.0000	2.53E-07
122		0.00	0.000	0.012	0.2881	0.2612	0.0000	2.53E-07
123		0.63	0.438	0.046	0.3025	0.2611	0.0000	2.53E-07
124		0.01	0.000	0.049	0.2982	0.2610	0.0000	2.53E-07
125		0.05	0.000	0.109	0.2920	0.2610	0.0000	2.53E-07
126	*	0.42	0.000	0.063	0.2939	0.2609	0.0000	2.53E-07
127		0.85	0.971	0.086	0.3067	0.2608	0.0000	2.53E-07
128		0.00	0.000	0.122	0.2945	0.2607	0.0000	2.52E-07
129		0.00	0.000	0.124	0.2821	0.2607	0.0000	2.52E-07
130		0.00	0.000	0.044	0.2777	0.2606	0.0000	2.52E-07
131		0.00	0.000	0.006	0.2772	0.2605	0.0000	2.52E-07
132		0.05	0.000	0.030	0.2792	0.2604	0.0000	2.52E-07
133		0.02	0.000	0.018	0.2793	0.2604	0.0000	2.52E-07
134		0.01	0.000	0.010	0.2791	0.2603	0.0000	2.52E-07
135		0.06	0.000	0.032	0.2824	0.2602	0.0000	2.52E-07
136		0.00	0.000	0.013	0.2811	0.2601	0.0000	2.52E-07
137		0.00	0.000	0.014	0.2797	0.2600	0.0000	2.52E-07
138		0.00	0.000	0.008	0.2789	0.2600	0.0000	2.52E-07
139		0.00	0.000	0.006	0.2783	0.2599	0.0000	2.52E-07
140		0.00	0.000	0.007	0.2778	0.2598	0.0000	2.52E-07
141		0.33	0.145	0.050	0.2914	0.2597	0.0000	2.52E-07
142		0.05	0.000	0.034	0.2934	0.2597	0.0000	2.52E-07
143		0.16	0.002	0.043	0.3052	0.2596	0.0000	2.51E-07
144		0.20	0.051	0.044	0.3157	0.2595	0.0000	2.51E-07
145		0.06	0.000	0.039	0.3180	0.2594	0.0000	2.51E-07
146		1.54	1.157	0.454	0.3106	0.2594	0.0000	2.51E-07
147		0.00	0.000	0.015	0.3091	0.2593	0.0000	2.51E-07
148		0.00	0.000	0.017	0.3074	0.2592	0.0000	2.51E-07
149		0.00	0.000	0.016	0.3058	0.2591	0.0000	2.51E-07
150		0.00	0.000	0.016	0.3041	0.2591	0.0000	2.51E-07
151		0.00	0.000	0.014	0.3027	0.2590	0.0000	2.51E-07
152		0.00	0.000	0.014	0.3013	0.2589	0.0000	2.51E-07

153	0.00	0.000	0.013	0.3000	0.2588	0.0000	2.51E-07
154	0.00	0.000	0.015	0.2984	0.2588	0.0000	2.51E-07
155	0.00	0.000	0.017	0.2970	0.2587	0.0000	2.51E-07
156	0.01	0.000	0.023	0.2958	0.2586	0.0000	2.51E-07
157	0.75	0.559	0.044	0.3109	0.2585	0.0000	2.51E-07
158	0.06	0.000	0.087	0.3086	0.2585	0.0000	2.50E-07
159	0.48	0.230	0.117	0.3218	0.2584	0.0000	2.50E-07
160	0.01	0.000	0.201	0.3023	0.2583	0.0000	2.50E-07
161	0.00	0.000	0.170	0.2854	0.2582	0.0000	2.50E-07
162	0.00	0.000	0.073	0.2780	0.2582	0.0000	2.50E-07
163	0.00	0.000	0.011	0.2772	0.2581	0.0000	2.50E-07
164	0.00	0.000	0.002	0.2770	0.2580	0.0000	2.50E-07
165	0.00	0.000	0.000	0.2770	0.2579	0.0000	2.50E-07
166	0.00	0.000	0.000	0.2770	0.2579	0.0000	2.50E-07
167	0.00	0.000	0.000	0.2770	0.2578	0.0000	2.50E-07
168	1.07	0.854	0.057	0.2931	0.2577	0.0000	2.50E-07
169	0.00	0.000	0.103	0.2832	0.2576	0.0000	2.50E-07
170	0.02	0.000	0.033	0.2819	0.2576	0.0000	2.50E-07
171	0.13	0.000	0.051	0.2894	0.2575	0.0000	2.50E-07
172	0.00	0.000	0.020	0.2873	0.2574	0.0000	2.50E-07
173	0.00	0.000	0.018	0.2855	0.2573	0.0000	2.49E-07
174	0.00	0.000	0.016	0.2840	0.2573	0.0000	2.49E-07
175	0.00	0.000	0.015	0.2825	0.2572	0.0000	2.49E-07
176	0.14	0.000	0.045	0.2920	0.2571	0.0000	2.49E-07
177	0.20	0.041	0.041	0.3043	0.2570	0.0000	2.49E-07
178	1.47	1.102	0.252	0.3155	0.2570	0.0000	2.49E-07
179	0.00	0.000	0.152	0.3004	0.2569	0.0000	2.49E-07
180	0.00	0.000	0.163	0.2841	0.2568	0.0000	2.49E-07
181	0.00	0.000	0.062	0.2779	0.2567	0.0000	2.49E-07
182	0.00	0.000	0.007	0.2771	0.2567	0.0000	2.49E-07
183	0.00	0.000	0.001	0.2770	0.2566	0.0000	2.49E-07
184	0.00	0.000	0.000	0.2770	0.2565	0.0000	2.49E-07

185	0.00	0.000	0.000	0.2770	0.2564	0.0000	2.49E-07
186	0.00	0.000	0.000	0.2770	0.2564	0.0000	2.49E-07
187	0.00	0.000	0.000	0.2770	0.2563	0.0000	2.49E-07
188	0.15	0.000	0.034	0.2891	0.2562	0.0000	2.48E-07
189	0.13	0.000	0.042	0.2981	0.2561	0.0000	2.48E-07
190	0.00	0.000	0.012	0.2969	0.2561	0.0000	2.48E-07
191	0.51	0.321	0.056	0.3098	0.2560	0.0000	2.48E-07
192	0.00	0.000	0.171	0.2927	0.2559	0.0000	2.48E-07
193	0.00	0.000	0.022	0.2905	0.2558	0.0000	2.48E-07
194	0.00	0.000	0.024	0.2882	0.2558	0.0000	2.48E-07
195	0.00	0.000	0.018	0.2864	0.2557	0.0000	2.48E-07
196	0.00	0.000	0.018	0.2846	0.2556	0.0000	2.48E-07
197	0.00	0.000	0.020	0.2826	0.2555	0.0000	2.48E-07
198	0.00	0.000	0.017	0.2809	0.2555	0.0000	2.48E-07
199	0.00	0.000	0.020	0.2789	0.2554	0.0000	2.48E-07
200	0.00	0.000	0.015	0.2774	0.2553	0.0000	2.48E-07
201	0.00	0.000	0.003	0.2770	0.2552	0.0000	2.48E-07
202	0.04	0.000	0.025	0.2787	0.2552	0.0000	2.48E-07
203	0.01	0.000	0.011	0.2787	0.2551	0.0000	2.48E-07
204	1.03	0.835	0.047	0.2931	0.2550	0.0000	2.47E-07
205	0.00	0.000	0.097	0.2835	0.2549	0.0000	2.47E-07
206	0.00	0.000	0.012	0.2823	0.2549	0.0000	2.47E-07
207	0.00	0.000	0.017	0.2807	0.2548	0.0000	2.47E-07
208	0.00	0.000	0.017	0.2789	0.2547	0.0000	2.47E-07
209	0.03	0.000	0.033	0.2785	0.2546	0.0000	2.47E-07
210	0.00	0.000	0.006	0.2779	0.2546	0.0000	2.47E-07
211	0.00	0.000	0.004	0.2774	0.2549	0.0000	2.47E-07
212	0.00	0.000	0.003	0.2771	0.2552	0.0000	2.48E-07
213	0.28	0.111	0.038	0.2899	0.2551	0.0000	2.48E-07
214	0.04	0.000	0.056	0.2882	0.2550	0.0000	2.47E-07
215	0.00	0.000	0.010	0.2872	0.2550	0.0000	2.47E-07
216	0.00	0.000	0.013	0.2859	0.2549	0.0000	2.47E-07

217	0.02	0.000	0.028	0.2849	0.2548	0.0000	2.47E-07
218	0.00	0.000	0.014	0.2836	0.2547	0.0000	2.47E-07
219	0.00	0.000	0.013	0.2823	0.2547	0.0000	2.47E-07
220	0.00	0.000	0.013	0.2810	0.2546	0.0000	2.47E-07
221	0.00	0.000	0.013	0.2798	0.2545	0.0000	2.47E-07
222	0.00	0.000	0.011	0.2786	0.2544	0.0000	2.47E-07
223	0.00	0.000	0.010	0.2776	0.2544	0.0000	2.47E-07
224	0.05	0.000	0.030	0.2800	0.2543	0.0000	2.47E-07
225	0.19	0.024	0.037	0.2929	0.2542	0.0000	2.47E-07
226	0.01	0.000	0.032	0.2911	0.2541	0.0000	2.47E-07
227	0.00	0.000	0.009	0.2902	0.2541	0.0000	2.47E-07
228	0.00	0.000	0.011	0.2890	0.2540	0.0000	2.47E-07
229	0.05	0.000	0.037	0.2907	0.2539	0.0000	2.46E-07
230	2.12	1.957	0.043	0.3031	0.2538	0.0000	2.46E-07
231	0.04	0.000	0.058	0.3008	0.2538	0.0000	2.46E-07
232	0.00	0.000	0.080	0.2929	0.2537	0.0000	2.46E-07
233	0.00	0.000	0.136	0.2793	0.2536	0.0000	2.46E-07
234	0.00	0.000	0.017	0.2776	0.2535	0.0000	2.46E-07
235	0.00	0.000	0.004	0.2771	0.2535	0.0000	2.46E-07
236	0.00	0.000	0.001	0.2770	0.2534	0.0000	2.46E-07
237	0.00	0.000	0.000	0.2770	0.2533	0.0000	2.46E-07
238	0.00	0.000	0.000	0.2770	0.2533	0.0000	2.46E-07
239	0.00	0.000	0.000	0.2770	0.2532	0.0000	2.46E-07
240	0.00	0.000	0.000	0.2770	0.2531	0.0000	2.46E-07
241	0.00	0.000	0.000	0.2770	0.2530	0.0000	2.46E-07
242	0.00	0.000	0.000	0.2770	0.2530	0.0000	2.46E-07
243	0.05	0.000	0.028	0.2794	0.2529	0.0000	2.46E-07
244	0.00	0.000	0.003	0.2792	0.2528	0.0000	2.45E-07
245	0.00	0.000	0.006	0.2786	0.2527	0.0000	2.45E-07
246	0.00	0.000	0.005	0.2781	0.2527	0.0000	2.45E-07
247	0.12	0.000	0.035	0.2868	0.2526	0.0000	2.45E-07
248	0.06	0.000	0.037	0.2895	0.2525	0.0000	2.45E-07

249		0.00	0.000	0.010	0.2884	0.2524	0.0000	2.45E-07
250		0.00	0.000	0.010	0.2875	0.2524	0.0000	2.45E-07
251		0.00	0.000	0.013	0.2862	0.2523	0.0000	2.45E-07
252		0.00	0.000	0.013	0.2849	0.2522	0.0000	2.45E-07
253		0.00	0.000	0.013	0.2836	0.2521	0.0000	2.45E-07
254		0.00	0.000	0.013	0.2823	0.2521	0.0000	2.45E-07
255		0.00	0.000	0.012	0.2810	0.2520	0.0000	2.45E-07
256		0.00	0.000	0.011	0.2800	0.2519	0.0000	2.45E-07
257		0.01	0.000	0.017	0.2790	0.2519	0.0000	2.45E-07
258		0.00	0.000	0.011	0.2778	0.2518	0.0000	2.45E-07
259		0.00	0.000	0.006	0.2772	0.2517	0.0000	2.45E-07
260		0.00	0.000	0.001	0.2770	0.2516	0.0000	2.44E-07
261		0.13	0.000	0.033	0.2865	0.2516	0.0000	2.44E-07
262		0.00	0.000	0.007	0.2859	0.2515	0.0000	2.44E-07
263		0.00	0.000	0.008	0.2851	0.2514	0.0000	2.44E-07
264		0.00	0.000	0.010	0.2842	0.2513	0.0000	2.44E-07
265		0.00	0.000	0.009	0.2832	0.2513	0.0000	2.44E-07
266		0.00	0.000	0.009	0.2823	0.2512	0.0000	2.44E-07
267		0.63	0.436	0.044	0.2973	0.2511	0.0000	2.44E-07
268		0.23	0.077	0.040	0.3082	0.2510	0.0000	2.44E-07
269		0.00	0.000	0.074	0.3008	0.2510	0.0000	2.44E-07
270		0.38	0.195	0.044	0.3144	0.2509	0.0000	2.44E-07
271		0.00	0.000	0.101	0.3043	0.2508	0.0000	2.44E-07
272		0.00	0.000	0.043	0.3001	0.2508	0.0000	2.44E-07
273		0.00	0.000	0.086	0.2914	0.2507	0.0000	2.44E-07
274		0.01	0.000	0.055	0.2872	0.2506	0.0000	2.44E-07
275		0.00	0.000	0.034	0.2838	0.2505	0.0000	2.43E-07
276		0.57	0.349	0.058	0.2997	0.2505	0.0000	2.43E-07
277	*	0.00	0.000	0.000	0.2997	0.2504	0.0000	2.43E-07
278		0.01	0.000	0.069	0.2933	0.2503	0.0000	2.43E-07
279		0.21	0.046	0.097	0.3000	0.2502	0.0000	2.43E-07
280		0.02	0.000	0.087	0.2937	0.2502	0.0000	2.43E-07

281		0.18	0.024	0.077	0.3019	0.2501	0.0000	2.43E-07
282		0.03	0.000	0.060	0.2991	0.2500	0.0000	2.43E-07
283		0.07	0.000	0.099	0.2964	0.2499	0.0000	2.43E-07
284		0.64	0.443	0.071	0.3092	0.2499	0.0000	2.43E-07
285		0.02	0.000	0.050	0.3061	0.2498	0.0000	2.43E-07
286		0.00	0.000	0.044	0.3018	0.2497	0.0000	2.43E-07
287	*	0.15	0.000	0.043	0.3037	0.2497	0.0000	2.43E-07
288		0.00	0.000	0.053	0.3057	0.2496	0.0000	2.43E-07
289		0.00	0.000	0.076	0.2995	0.2495	0.0000	2.43E-07
290		0.00	0.000	0.058	0.2937	0.2494	0.0000	2.42E-07
291		0.00	0.000	0.030	0.2907	0.2494	0.0000	2.42E-07
292		0.00	0.000	0.031	0.2876	0.2493	0.0000	2.42E-07
293	*	0.00	0.000	0.030	0.2845	0.2492	0.0000	2.42E-07
294		0.00	0.000	0.044	0.2801	0.2491	0.0000	2.42E-07
295		0.00	0.000	0.027	0.2778	0.2491	0.0000	2.42E-07
296		0.00	0.000	0.006	0.2772	0.2490	0.0000	2.42E-07
297		0.00	0.000	0.005	0.2770	0.2489	0.0000	2.42E-07
298		0.00	0.000	0.000	0.2770	0.2489	0.0000	2.42E-07
299		0.00	0.000	0.000	0.2770	0.2488	0.0000	2.42E-07
300	*	0.29	0.000	0.032	0.2790	0.2487	0.0000	2.42E-07
301		0.07	0.119	0.048	0.2933	0.2486	0.0000	2.42E-07
302		0.00	0.000	0.012	0.2921	0.2486	0.0000	2.42E-07
303		0.47	0.271	0.057	0.3063	0.2485	0.0000	2.42E-07
304		0.00	0.000	0.063	0.2999	0.2484	0.0000	2.42E-07
305		0.00	0.000	0.042	0.2958	0.2483	0.0000	2.42E-07
306	*	0.00	0.000	0.018	0.2940	0.2483	0.0000	2.41E-07
307		0.00	0.000	0.028	0.2912	0.2482	0.0000	2.41E-07
308	*	0.06	0.000	0.040	0.2930	0.2481	0.0000	2.41E-07
309	*	0.13	0.000	0.049	0.2949	0.2481	0.0000	2.41E-07
310		0.25	0.171	0.013	0.3077	0.2480	0.0000	2.41E-07
311		0.00	0.000	0.031	0.3045	0.2479	0.0000	2.41E-07
312		0.00	0.000	0.040	0.3005	0.2478	0.0000	2.41E-07

313		0.00	0.000	0.053	0.2952	0.2478	0.0000	2.41E-07
314		0.00	0.000	0.026	0.2926	0.2477	0.0000	2.41E-07
315		0.00	0.000	0.022	0.2904	0.2476	0.0000	2.41E-07
316		0.00	0.000	0.021	0.2883	0.2475	0.0000	2.41E-07
317	*	0.00	0.000	0.011	0.2871	0.2475	0.0000	2.41E-07
318	*	0.00	0.000	0.000	0.2871	0.2474	0.0000	2.41E-07
319	*	0.00	0.000	0.023	0.2849	0.2473	0.0000	2.41E-07
320		0.00	0.000	0.048	0.2800	0.2473	0.0000	2.41E-07
321		0.00	0.000	0.015	0.2785	0.2472	0.0000	2.40E-07
322		0.00	0.000	0.013	0.2772	0.2471	0.0000	2.40E-07
323	*	0.00	0.000	0.000	0.2772	0.2470	0.0000	2.40E-07
324	*	0.00	0.000	0.000	0.2772	0.2470	0.0000	2.40E-07
325		0.00	0.000	0.002	0.2771	0.2469	0.0000	2.40E-07
326		0.00	0.000	0.001	0.2770	0.2468	0.0000	2.40E-07
327		0.00	0.000	0.000	0.2770	0.2467	0.0000	2.40E-07
328		0.00	0.000	0.000	0.2770	0.2467	0.0000	2.40E-07
329		0.00	0.000	0.000	0.2770	0.2466	0.0000	2.40E-07
330		0.18	0.009	0.040	0.2897	0.2465	0.0000	2.40E-07
331		0.05	0.000	0.034	0.2914	0.2465	0.0000	2.40E-07
332		0.00	0.000	0.012	0.2902	0.2464	0.0000	2.40E-07
333		0.20	0.032	0.040	0.3029	0.2463	0.0000	2.40E-07
334		0.00	0.000	0.030	0.2999	0.2462	0.0000	2.40E-07
335		0.03	0.000	0.033	0.2999	0.2462	0.0000	2.40E-07
336		0.01	0.000	0.023	0.2987	0.2461	0.0000	2.40E-07
337		0.00	0.000	0.013	0.2974	0.2460	0.0000	2.39E-07
338		0.00	0.000	0.011	0.2963	0.2460	0.0000	2.39E-07
339	*	0.00	0.000	0.000	0.2963	0.2459	0.0000	2.39E-07
340		0.00	0.000	0.011	0.2952	0.2458	0.0000	2.39E-07
341		0.05	0.000	0.034	0.2963	0.2457	0.0000	2.39E-07
342		0.00	0.000	0.011	0.2952	0.2457	0.0000	2.39E-07
343		0.00	0.000	0.012	0.2940	0.2456	0.0000	2.39E-07
344		0.00	0.000	0.012	0.2929	0.2455	0.0000	2.39E-07

345	*	0.01	0.000	0.007	0.2929	0.2455	0.0000	2.39E-07
346	*	0.00	0.000	0.010	0.2919	0.2454	0.0000	2.39E-07
347		0.00	0.000	0.009	0.2910	0.2453	0.0000	2.39E-07
348		0.32	0.133	0.044	0.3055	0.2452	0.0000	2.39E-07
349		0.29	0.122	0.062	0.3162	0.2452	0.0000	2.39E-07
350		0.15	0.007	0.045	0.3256	0.2451	0.0000	2.39E-07
351	*	0.02	0.000	0.018	0.3256	0.2450	0.0000	2.39E-07
352		0.00	0.000	0.032	0.3224	0.2450	0.0000	2.39E-07
353		0.00	0.000	0.034	0.3190	0.2449	0.0000	2.38E-07
354		0.12	0.000	0.060	0.3253	0.2448	0.0000	2.38E-07
355		0.00	0.000	0.017	0.3236	0.2448	0.0000	2.38E-07
356	*	0.39	0.000	0.023	0.3255	0.2447	0.0000	2.38E-07
357		0.00	0.173	0.042	0.3383	0.2446	0.0000	2.38E-07
358		1.31	1.136	0.061	0.3499	0.2445	0.0000	2.38E-07
359		0.16	0.041	0.057	0.3564	0.2445	0.0000	2.38E-07
360		0.00	0.000	0.037	0.3527	0.2444	0.0000	2.38E-07
361		0.00	0.000	0.029	0.3498	0.2443	0.0000	2.38E-07
362	*	0.00	0.000	0.000	0.3498	0.2443	0.0000	2.38E-07
363	*	0.61	0.000	0.015	0.3518	0.2442	0.0000	2.38E-07
364	*	0.00	0.000	0.020	0.3538	0.2441	0.0000	2.38E-07
365	*	0.00	0.000	0.022	0.3558	0.2440	0.0000	2.38E-07

* = Frozen (air or soil)

Annual Totals for Year 20			
	inches	cubic feet	percent
Precipitation	32.23	116,991.7	100.00
Runoff	19.342	70,210.6	60.01
Evapotranspiration	12.137	44,056.0	37.66
Recirculation into Layer 1	0.0107	38.7	0.03
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0107	38.7	0.03
Percolation/Leakage through Layer 5	0.000091	0.3310	0.00
Average Head on Top of Layer 4	0.2570	---	---
Change in Water Storage	0.7506	2,724.7	2.33
Soil Water at Start of Year	1,407.0611	5,107,631.7	4365.81
Soil Water at End of Year	1,407.3507	5,108,683.1	4366.71
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.4610	1,673.3	1.43
Annual Water Budget Balance	-0.0107	-38.7	-0.03

Daily Output for Year 21

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.07	0.000	0.010	0.3597	0.2439	0.0000	2.38E-07
2			0.20	0.113	0.000	0.3724	0.2438	0.0000	2.38E-07
3	*		0.12	0.000	0.020	0.3744	0.2438	0.0000	2.37E-07
4	*		0.20	0.000	0.025	0.3764	0.2437	0.0000	2.37E-07
5	*		0.13	0.000	0.000	0.3784	0.2436	0.0000	2.37E-07
6	*	*	0.04	0.000	0.017	0.3784	0.2435	0.0000	2.37E-07
7	*	*	0.15	0.000	0.023	0.3784	0.2435	0.0000	2.37E-07
8	*	*	0.02	0.000	0.000	0.3784	0.2434	0.0000	2.37E-07
9		*	0.39	1.359	0.000	0.3795	0.2433	0.0000	2.37E-07
10		*	0.00	0.000	0.000	0.3795	0.2433	0.0000	2.37E-07
11	*	*	0.00	0.000	0.000	0.3795	0.2432	0.0000	2.37E-07
12		*	0.00	0.000	0.000	0.3795	0.2431	0.0000	2.37E-07
13	*	*	0.00	0.000	0.000	0.3795	0.2430	0.0000	2.37E-07
14	*	*	0.00	0.000	0.000	0.3795	0.2430	0.0000	2.37E-07
15	*	*	0.00	0.000	0.000	0.3795	0.2429	0.0000	2.37E-07
16	*	*	0.00	0.000	0.000	0.3795	0.2428	0.0000	2.37E-07
17		*	0.00	0.000	0.000	0.3795	0.2428	0.0000	2.37E-07
18		*	0.00	0.000	0.000	0.3795	0.2427	0.0000	2.36E-07
19			0.00	0.000	0.039	0.3756	0.2426	0.0000	2.36E-07
20			0.00	0.000	0.043	0.3715	0.2425	0.0000	2.36E-07
21	*		0.17	0.000	0.046	0.3735	0.2425	0.0000	2.36E-07
22	*	*	0.18	0.000	0.032	0.3735	0.2424	0.0000	2.36E-07
23		*	0.00	0.097	0.077	0.3823	0.2423	0.0000	2.36E-07
24		*	0.02	0.000	0.014	0.3828	0.2423	0.0000	2.36E-07

25			0.00	0.000	0.031	0.3796	0.2422	0.0000	2.36E-07
26	*		0.00	0.000	0.030	0.3766	0.2421	0.0000	2.36E-07
27			0.00	0.000	0.039	0.3728	0.2420	0.0000	2.36E-07
28			0.00	0.000	0.023	0.3705	0.2420	0.0000	2.36E-07
29	*		0.00	0.000	0.000	0.3705	0.2419	0.0000	2.36E-07
30	*	*	0.23	0.000	0.009	0.3705	0.2418	0.0000	2.36E-07
31	*	*	0.01	0.000	0.013	0.3705	0.2418	0.0000	2.36E-07
32	*	*	0.03	0.000	0.006	0.3705	0.2417	0.0000	2.36E-07
33	*	*	0.00	0.000	0.012	0.3705	0.2416	0.0000	2.36E-07
34		*	0.00	0.150	0.052	0.3734	0.2415	0.0000	2.35E-07
35		*	0.00	0.000	0.000	0.3734	0.2415	0.0000	2.35E-07
36	*	*	0.00	0.000	0.000	0.3734	0.2414	0.0000	2.35E-07
37	*	*	0.00	0.000	0.000	0.3734	0.2413	0.0000	2.35E-07
38	*	*	0.00	0.000	0.000	0.3735	0.2413	0.0000	2.35E-07
39	*	*	0.00	0.000	0.000	0.3735	0.2412	0.0000	2.35E-07
40	*	*	0.00	0.000	0.000	0.3735	0.2411	0.0000	2.35E-07
41		*	0.00	0.000	0.000	0.3735	0.2411	0.0000	2.35E-07
42	*	*	0.00	0.000	0.000	0.3735	0.2410	0.0000	2.35E-07
43	*	*	0.14	0.000	0.047	0.3735	0.2409	0.0000	2.35E-07
44	*	*	0.09	0.000	0.045	0.3735	0.2408	0.0000	2.35E-07
45		*	0.03	0.033	0.042	0.3821	0.2408	0.0000	2.35E-07
46		*	0.00	0.000	0.000	0.3822	0.2407	0.0000	2.35E-07
47			0.00	0.000	0.024	0.3797	0.2406	0.0000	2.35E-07
48	*		0.29	0.000	0.041	0.3817	0.2406	0.0000	2.35E-07
49	*	*	0.02	0.000	0.018	0.3817	0.2405	0.0000	2.35E-07
50	*	*	0.00	0.000	0.035	0.3817	0.2404	0.0000	2.34E-07
51	*	*	0.00	0.000	0.045	0.3817	0.2403	0.0000	2.34E-07
52		*	0.14	0.139	0.054	0.3916	0.2403	0.0000	2.34E-07
53		*	0.00	0.000	0.000	0.3916	0.2402	0.0000	2.34E-07
54			0.00	0.000	0.114	0.3801	0.2401	0.0000	2.34E-07
55			0.00	0.000	0.156	0.3645	0.2401	0.0000	2.34E-07
56			0.00	0.000	0.060	0.3585	0.2400	0.0000	2.34E-07

57		0.00	0.000	0.126	0.3459	0.2399	0.0000	2.34E-07
58		0.00	0.000	0.175	0.3284	0.2399	0.0000	2.34E-07
59		0.00	0.000	0.130	0.3154	0.2398	0.0000	2.34E-07
60		0.05	0.000	0.063	0.3137	0.2397	0.0000	2.34E-07
61		0.00	0.000	0.038	0.3099	0.2396	0.0000	2.34E-07
62		0.00	0.000	0.035	0.3064	0.2396	0.0000	2.34E-07
63		0.00	0.000	0.031	0.3034	0.2395	0.0000	2.34E-07
64		0.00	0.000	0.027	0.3007	0.2394	0.0000	2.34E-07
65		0.00	0.000	0.025	0.2982	0.2394	0.0000	2.34E-07
66		0.00	0.000	0.024	0.2958	0.2393	0.0000	2.33E-07
67	*	0.00	0.000	0.000	0.2958	0.2392	0.0000	2.33E-07
68	*	0.00	0.000	0.000	0.2958	0.2392	0.0000	2.33E-07
69	*	0.00	0.000	0.000	0.2958	0.2391	0.0000	2.33E-07
70		0.33	0.144	0.049	0.3092	0.2390	0.0000	2.33E-07
71		0.08	0.000	0.046	0.3127	0.2389	0.0000	2.33E-07
72		0.00	0.000	0.020	0.3107	0.2389	0.0000	2.33E-07
73		0.01	0.000	0.024	0.3088	0.2388	0.0000	2.33E-07
74		1.10	0.921	0.044	0.3228	0.2387	0.0000	2.33E-07
75		0.51	0.291	0.108	0.3344	0.2387	0.0000	2.33E-07
76		0.02	0.000	0.250	0.3116	0.2386	0.0000	2.33E-07
77		0.37	0.164	0.104	0.3215	0.2385	0.0000	2.33E-07
78		0.00	0.000	0.101	0.3115	0.2385	0.0000	2.33E-07
79		0.00	0.000	0.066	0.3052	0.2384	0.0000	2.33E-07
80		0.00	0.000	0.055	0.2997	0.2419	0.0000	2.36E-07
81		0.20	0.038	0.112	0.3046	0.2428	0.0000	2.37E-07
82		0.00	0.000	0.092	0.2951	0.2459	0.0000	2.39E-07
83		0.00	0.000	0.048	0.2907	0.2499	0.0000	2.43E-07
84		0.73	0.387	0.199	0.3053	0.2498	0.0000	2.43E-07
85		0.00	0.000	0.078	0.2976	0.2497	0.0000	2.43E-07
86		0.00	0.000	0.069	0.2909	0.2496	0.0000	2.43E-07
87	*	0.03	0.000	0.034	0.2909	0.2496	0.0000	2.43E-07
88	*	0.24	0.000	0.021	0.2929	0.2495	0.0000	2.43E-07

89		0.00	0.002	0.127	0.2998	0.2494	0.0000	2.42E-07
90	*	0.00	0.000	0.004	0.2998	0.2494	0.0000	2.42E-07
91		0.00	0.000	0.050	0.2948	0.2493	0.0000	2.42E-07
92		0.00	0.000	0.119	0.2829	0.2492	0.0000	2.42E-07
93		0.00	0.000	0.046	0.2783	0.2491	0.0000	2.42E-07
94		0.21	0.047	0.073	0.2875	0.2491	0.0000	2.42E-07
95		0.83	0.640	0.077	0.2991	0.2490	0.0000	2.42E-07
96		0.00	0.000	0.056	0.2935	0.2489	0.0000	2.42E-07
97		0.00	0.000	0.084	0.2852	0.2488	0.0000	2.42E-07
98	*	0.00	0.000	0.034	0.2817	0.2488	0.0000	2.42E-07
99	*	0.00	0.000	0.000	0.2817	0.2487	0.0000	2.42E-07
100	*	0.00	0.000	0.035	0.2782	0.2486	0.0000	2.42E-07
101		0.00	0.000	0.009	0.2773	0.2486	0.0000	2.42E-07
102	*	0.09	0.000	0.047	0.2793	0.2485	0.0000	2.42E-07
103		0.00	0.000	0.033	0.2779	0.2484	0.0000	2.42E-07
104		0.00	0.000	0.007	0.2773	0.2483	0.0000	2.42E-07
105	*	0.00	0.000	0.002	0.2771	0.2483	0.0000	2.41E-07
106		0.00	0.000	0.000	0.2770	0.2482	0.0000	2.41E-07
107		0.89	0.678	0.054	0.2933	0.2481	0.0000	2.41E-07
108		0.82	0.482	0.222	0.3048	0.2480	0.0000	2.41E-07
109		0.28	0.115	0.129	0.3088	0.2480	0.0000	2.41E-07
110		0.00	0.000	0.132	0.2956	0.2479	0.0000	2.41E-07
111		0.00	0.000	0.156	0.2799	0.2478	0.0000	2.41E-07
112		0.00	0.000	0.022	0.2777	0.2478	0.0000	2.41E-07
113		0.00	0.000	0.006	0.2772	0.2477	0.0000	2.41E-07
114		0.63	0.398	0.065	0.2933	0.2476	0.0000	2.41E-07
115		0.18	0.029	0.077	0.3006	0.2475	0.0000	2.41E-07
116		0.00	0.000	0.040	0.2966	0.2475	0.0000	2.41E-07
117		0.06	0.000	0.165	0.2862	0.2474	0.0000	2.41E-07
118		0.35	0.115	0.154	0.2944	0.2473	0.0000	2.41E-07
119		0.57	0.381	0.078	0.3059	0.2473	0.0000	2.41E-07
120		0.00	0.000	0.197	0.2862	0.2472	0.0000	2.40E-07

121	0.00	0.000	0.034	0.2828	0.2471	0.0000	2.40E-07
122	0.00	0.000	0.030	0.2798	0.2470	0.0000	2.40E-07
123	0.00	0.000	0.024	0.2774	0.2470	0.0000	2.40E-07
124	0.00	0.000	0.003	0.2771	0.2469	0.0000	2.40E-07
125	0.00	0.000	0.001	0.2770	0.2468	0.0000	2.40E-07
126	0.00	0.000	0.000	0.2770	0.2467	0.0000	2.40E-07
127	0.00	0.000	0.000	0.2770	0.2467	0.0000	2.40E-07
128	0.00	0.000	0.000	0.2770	0.2466	0.0000	2.40E-07
129	0.00	0.000	0.000	0.2770	0.2465	0.0000	2.40E-07
130	0.00	0.000	0.000	0.2770	0.2465	0.0000	2.40E-07
131	0.00	0.000	0.000	0.2770	0.2464	0.0000	2.40E-07
132	0.10	0.000	0.024	0.2843	0.2463	0.0000	2.40E-07
133	0.00	0.000	0.008	0.2835	0.2462	0.0000	2.40E-07
134	0.00	0.000	0.008	0.2828	0.2462	0.0000	2.40E-07
135	0.00	0.000	0.010	0.2817	0.2461	0.0000	2.40E-07
136	0.00	0.000	0.011	0.2806	0.2460	0.0000	2.39E-07
137	0.07	0.000	0.034	0.2847	0.2460	0.0000	2.39E-07
138	0.29	0.122	0.039	0.2971	0.2459	0.0000	2.39E-07
139	0.00	0.000	0.014	0.2962	0.2458	0.0000	2.39E-07
140	0.83	0.643	0.038	0.3107	0.2457	0.0000	2.39E-07
141	0.02	0.000	0.057	0.3073	0.2457	0.0000	2.39E-07
142	0.00	0.000	0.075	0.2998	0.2456	0.0000	2.39E-07
143	0.00	0.000	0.136	0.2861	0.2455	0.0000	2.39E-07
144	0.00	0.000	0.077	0.2784	0.2455	0.0000	2.39E-07
145	0.00	0.000	0.011	0.2774	0.2454	0.0000	2.39E-07
146	0.50	0.289	0.066	0.2922	0.2453	0.0000	2.39E-07
147	0.27	0.082	0.145	0.2964	0.2452	0.0000	2.39E-07
148	0.00	0.000	0.072	0.2892	0.2452	0.0000	2.39E-07
149	0.19	0.034	0.100	0.2950	0.2451	0.0000	2.39E-07
150	0.14	0.000	0.058	0.3031	0.2450	0.0000	2.39E-07
151	0.57	0.319	0.128	0.3151	0.2450	0.0000	2.39E-07
152	0.00	0.000	0.153	0.2997	0.2449	0.0000	2.38E-07

153	0.00	0.000	0.106	0.2892	0.2448	0.0000	2.38E-07
154	0.00	0.000	0.046	0.2846	0.2447	0.0000	2.38E-07
155	0.94	0.711	0.066	0.3005	0.2447	0.0000	2.38E-07
156	0.00	0.000	0.168	0.2837	0.2446	0.0000	2.38E-07
157	0.00	0.000	0.035	0.2804	0.2445	0.0000	2.38E-07
158	0.00	0.000	0.027	0.2777	0.2445	0.0000	2.38E-07
159	0.00	0.000	0.005	0.2772	0.2444	0.0000	2.38E-07
160	0.00	0.000	0.001	0.2770	0.2443	0.0000	2.38E-07
161	0.00	0.000	0.000	0.2770	0.2442	0.0000	2.38E-07
162	0.01	0.000	0.009	0.2770	0.2442	0.0000	2.38E-07
163	0.15	0.000	0.031	0.2892	0.2441	0.0000	2.38E-07
164	0.43	0.260	0.045	0.3013	0.2440	0.0000	2.38E-07
165	0.00	0.000	0.114	0.2899	0.2440	0.0000	2.38E-07
166	0.00	0.000	0.017	0.2882	0.2439	0.0000	2.38E-07
167	0.54	0.341	0.044	0.3034	0.2438	0.0000	2.38E-07
168	0.00	0.000	0.069	0.2968	0.2437	0.0000	2.37E-07
169	0.05	0.000	0.205	0.2811	0.2437	0.0000	2.37E-07
170	0.08	0.000	0.054	0.2838	0.2436	0.0000	2.37E-07
171	0.12	0.000	0.051	0.2907	0.2435	0.0000	2.37E-07
172	0.04	0.000	0.038	0.2907	0.2435	0.0000	2.37E-07
173	0.00	0.000	0.019	0.2889	0.2434	0.0000	2.37E-07
174	0.00	0.000	0.021	0.2868	0.2433	0.0000	2.37E-07
175	0.21	0.057	0.042	0.2982	0.2432	0.0000	2.37E-07
176	0.00	0.000	0.015	0.2968	0.2432	0.0000	2.37E-07
177	0.00	0.000	0.020	0.2948	0.2431	0.0000	2.37E-07
178	0.00	0.000	0.017	0.2930	0.2430	0.0000	2.37E-07
179	0.00	0.000	0.016	0.2914	0.2430	0.0000	2.37E-07
180	0.00	0.000	0.016	0.2899	0.2429	0.0000	2.37E-07
181	0.50	0.309	0.046	0.3041	0.2428	0.0000	2.37E-07
182	0.20	0.048	0.132	0.3065	0.2427	0.0000	2.37E-07
183	0.07	0.000	0.152	0.2980	0.2427	0.0000	2.36E-07
184	0.00	0.000	0.154	0.2826	0.2426	0.0000	2.36E-07

185	0.71	0.428	0.124	0.2981	0.2425	0.0000	2.36E-07
186	1.33	1.082	0.137	0.3094	0.2425	0.0000	2.36E-07
187	0.00	0.000	0.173	0.2921	0.2424	0.0000	2.36E-07
188	0.00	0.000	0.117	0.2804	0.2423	0.0000	2.36E-07
189	0.00	0.000	0.027	0.2778	0.2424	0.0000	2.36E-07
190	0.00	0.000	0.006	0.2771	0.2424	0.0000	2.36E-07
191	0.01	0.000	0.015	0.2770	0.2423	0.0000	2.36E-07
192	0.33	0.138	0.063	0.2899	0.2422	0.0000	2.36E-07
193	0.79	0.623	0.058	0.3013	0.2421	0.0000	2.36E-07
194	0.00	0.000	0.134	0.2879	0.2421	0.0000	2.36E-07
195	0.00	0.000	0.092	0.2787	0.2420	0.0000	2.36E-07
196	0.76	0.452	0.161	0.2931	0.2419	0.0000	2.36E-07
197	1.07	0.706	0.253	0.3041	0.2419	0.0000	2.36E-07
198	0.11	0.001	0.169	0.2984	0.2418	0.0000	2.36E-07
199	0.00	0.000	0.112	0.2872	0.2417	0.0000	2.36E-07
200	0.01	0.000	0.086	0.2795	0.2416	0.0000	2.36E-07
201	0.36	0.148	0.086	0.2920	0.2416	0.0000	2.36E-07
202	0.00	0.000	0.107	0.2813	0.2415	0.0000	2.35E-07
203	0.00	0.000	0.029	0.2784	0.2414	0.0000	2.35E-07
204	0.00	0.000	0.010	0.2773	0.2414	0.0000	2.35E-07
205	0.00	0.000	0.003	0.2771	0.2413	0.0000	2.35E-07
206	0.04	0.000	0.024	0.2792	0.2412	0.0000	2.35E-07
207	0.00	0.000	0.003	0.2789	0.2412	0.0000	2.35E-07
208	0.00	0.000	0.006	0.2783	0.2411	0.0000	2.35E-07
209	0.11	0.000	0.029	0.2860	0.2410	0.0000	2.35E-07
210	1.42	1.246	0.050	0.2984	0.2409	0.0000	2.35E-07
211	0.66	0.328	0.269	0.3048	0.2409	0.0000	2.35E-07
212	0.12	0.001	0.093	0.3070	0.2408	0.0000	2.35E-07
213	0.30	0.107	0.215	0.3045	0.2407	0.0000	2.35E-07
214	0.00	0.000	0.091	0.2954	0.2407	0.0000	2.35E-07
215	0.27	0.081	0.166	0.2975	0.2406	0.0000	2.35E-07
216	0.86	0.537	0.214	0.3084	0.2405	0.0000	2.35E-07

217	0.00	0.000	0.105	0.2979	0.2404	0.0000	2.35E-07
218	0.16	0.002	0.076	0.3057	0.2404	0.0000	2.34E-07
219	0.00	0.000	0.123	0.2934	0.2403	0.0000	2.34E-07
220	0.00	0.000	0.103	0.2831	0.2402	0.0000	2.34E-07
221	0.00	0.000	0.047	0.2785	0.2402	0.0000	2.34E-07
222	0.22	0.056	0.069	0.2881	0.2401	0.0000	2.34E-07
223	0.05	0.000	0.047	0.2881	0.2400	0.0000	2.34E-07
224	0.00	0.000	0.033	0.2848	0.2400	0.0000	2.34E-07
225	0.00	0.000	0.023	0.2825	0.2399	0.0000	2.34E-07
226	0.00	0.000	0.024	0.2800	0.2398	0.0000	2.34E-07
227	0.00	0.000	0.023	0.2777	0.2397	0.0000	2.34E-07
228	0.00	0.000	0.006	0.2772	0.2397	0.0000	2.34E-07
229	0.00	0.000	0.001	0.2770	0.2396	0.0000	2.34E-07
230	0.00	0.000	0.000	0.2770	0.2395	0.0000	2.34E-07
231	0.00	0.000	0.000	0.2770	0.2395	0.0000	2.34E-07
232	0.10	0.000	0.026	0.2848	0.2394	0.0000	2.34E-07
233	0.00	0.000	0.018	0.2834	0.2393	0.0000	2.34E-07
234	0.00	0.000	0.017	0.2817	0.2393	0.0000	2.33E-07
235	0.00	0.000	0.016	0.2801	0.2392	0.0000	2.33E-07
236	0.00	0.000	0.015	0.2786	0.2391	0.0000	2.33E-07
237	0.06	0.000	0.029	0.2815	0.2390	0.0000	2.33E-07
238	0.09	0.000	0.033	0.2872	0.2390	0.0000	2.33E-07
239	0.00	0.000	0.010	0.2862	0.2389	0.0000	2.33E-07
240	0.00	0.000	0.011	0.2850	0.2388	0.0000	2.33E-07
241	0.00	0.000	0.015	0.2835	0.2388	0.0000	2.33E-07
242	0.00	0.000	0.015	0.2820	0.2387	0.0000	2.33E-07
243	0.00	0.000	0.014	0.2807	0.2386	0.0000	2.33E-07
244	0.32	0.141	0.042	0.2943	0.2386	0.0000	2.33E-07
245	0.76	0.608	0.041	0.3056	0.2385	0.0000	2.33E-07
246	0.21	0.063	0.077	0.3127	0.2384	0.0000	2.33E-07
247	0.00	0.000	0.075	0.3053	0.2383	0.0000	2.33E-07
248	0.00	0.000	0.054	0.2998	0.2383	0.0000	2.33E-07

249	0.01	0.000	0.068	0.2937	0.2382	0.0000	2.33E-07
250	0.00	0.000	0.110	0.2827	0.2381	0.0000	2.32E-07
251	0.00	0.000	0.048	0.2779	0.2381	0.0000	2.32E-07
252	0.00	0.000	0.007	0.2772	0.2380	0.0000	2.32E-07
253	0.00	0.000	0.002	0.2771	0.2379	0.0000	2.32E-07
254	0.00	0.000	0.001	0.2770	0.2379	0.0000	2.32E-07
255	0.00	0.000	0.000	0.2770	0.2378	0.0000	2.32E-07
256	0.00	0.000	0.000	0.2770	0.2377	0.0000	2.32E-07
257	0.00	0.000	0.000	0.2770	0.2377	0.0000	2.32E-07
258	0.00	0.000	0.000	0.2770	0.2376	0.0000	2.32E-07
259	0.00	0.000	0.000	0.2770	0.2375	0.0000	2.32E-07
260	0.38	0.199	0.047	0.2909	0.2374	0.0000	2.32E-07
261	0.00	0.000	0.009	0.2900	0.2374	0.0000	2.32E-07
262	0.00	0.000	0.015	0.2884	0.2373	0.0000	2.32E-07
263	0.00	0.000	0.013	0.2871	0.2372	0.0000	2.32E-07
264	0.00	0.000	0.013	0.2858	0.2372	0.0000	2.32E-07
265	0.01	0.000	0.020	0.2847	0.2371	0.0000	2.32E-07
266	0.00	0.000	0.013	0.2834	0.2370	0.0000	2.31E-07
267	0.00	0.000	0.013	0.2822	0.2370	0.0000	2.31E-07
268	0.00	0.000	0.011	0.2810	0.2369	0.0000	2.31E-07
269	0.00	0.000	0.012	0.2799	0.2368	0.0000	2.31E-07
270	0.12	0.000	0.036	0.2878	0.2368	0.0000	2.31E-07
271	0.04	0.000	0.032	0.2883	0.2367	0.0000	2.31E-07
272	1.10	0.931	0.040	0.3011	0.2366	0.0000	2.31E-07
273	0.89	0.655	0.118	0.3126	0.2365	0.0000	2.31E-07
274	0.03	0.000	0.062	0.3092	0.2365	0.0000	2.31E-07
275	1.44	1.119	0.180	0.3231	0.2364	0.0000	2.31E-07
276	0.04	0.000	0.166	0.3108	0.2364	0.0000	2.31E-07
277	0.00	0.000	0.144	0.2964	0.2364	0.0000	2.31E-07
278	0.00	0.000	0.058	0.2906	0.2363	0.0000	2.31E-07
279	0.00	0.000	0.125	0.2781	0.2362	0.0000	2.31E-07
280	2.28	2.008	0.111	0.2944	0.2362	0.0000	2.31E-07

281		0.00	0.000	0.091	0.2853	0.2361	0.0000	2.31E-07
282		0.00	0.000	0.065	0.2788	0.2360	0.0000	2.31E-07
283		0.00	0.000	0.014	0.2775	0.2360	0.0000	2.31E-07
284		0.00	0.000	0.003	0.2771	0.2359	0.0000	2.30E-07
285		0.13	0.000	0.030	0.2870	0.2358	0.0000	2.30E-07
286		0.00	0.000	0.018	0.2853	0.2358	0.0000	2.30E-07
287		0.00	0.000	0.022	0.2831	0.2357	0.0000	2.30E-07
288		0.00	0.000	0.021	0.2810	0.2356	0.0000	2.30E-07
289		0.00	0.000	0.019	0.2792	0.2356	0.0000	2.30E-07
290		0.48	0.271	0.050	0.2947	0.2355	0.0000	2.30E-07
291		0.00	0.000	0.096	0.2851	0.2354	0.0000	2.30E-07
292		0.00	0.000	0.017	0.2834	0.2354	0.0000	2.30E-07
293		0.00	0.000	0.014	0.2820	0.2353	0.0000	2.30E-07
294		0.00	0.000	0.017	0.2803	0.2352	0.0000	2.30E-07
295		0.23	0.065	0.042	0.2921	0.2351	0.0000	2.30E-07
296	*	0.49	0.000	0.040	0.2941	0.2351	0.0000	2.30E-07
297	*	0.00	0.000	0.022	0.2961	0.2350	0.0000	2.30E-07
298		0.35	0.605	0.000	0.3088	0.2349	0.0000	2.30E-07
299	*	0.00	0.000	0.024	0.3064	0.2349	0.0000	2.30E-07
300		0.00	0.000	0.050	0.3015	0.2348	0.0000	2.29E-07
301		0.00	0.000	0.087	0.2928	0.2347	0.0000	2.29E-07
302		0.00	0.000	0.059	0.2869	0.2347	0.0000	2.29E-07
303		0.00	0.000	0.068	0.2800	0.2346	0.0000	2.29E-07
304		0.00	0.000	0.025	0.2776	0.2345	0.0000	2.29E-07
305		0.09	0.000	0.040	0.2825	0.2345	0.0000	2.29E-07
306		0.36	0.140	0.079	0.2962	0.2344	0.0000	2.29E-07
307		0.00	0.000	0.035	0.2927	0.2343	0.0000	2.29E-07
308		0.00	0.000	0.041	0.2886	0.2343	0.0000	2.29E-07
309		0.00	0.000	0.035	0.2851	0.2342	0.0000	2.29E-07
310		0.07	0.000	0.058	0.2858	0.2341	0.0000	2.29E-07
311		0.08	0.000	0.067	0.2872	0.2340	0.0000	2.29E-07
312		0.00	0.000	0.029	0.2843	0.2340	0.0000	2.29E-07

313		0.27	0.095	0.054	0.2965	0.2339	0.0000	2.29E-07
314		0.06	0.000	0.052	0.2974	0.2338	0.0000	2.29E-07
315		0.00	0.000	0.034	0.2941	0.2338	0.0000	2.29E-07
316		0.00	0.000	0.033	0.2907	0.2337	0.0000	2.28E-07
317		0.00	0.000	0.037	0.2871	0.2336	0.0000	2.28E-07
318		0.00	0.000	0.037	0.2834	0.2336	0.0000	2.28E-07
319		0.00	0.000	0.028	0.2805	0.2335	0.0000	2.28E-07
320		0.00	0.000	0.023	0.2783	0.2334	0.0000	2.28E-07
321		0.00	0.000	0.010	0.2773	0.2334	0.0000	2.28E-07
322		0.00	0.000	0.002	0.2771	0.2333	0.0000	2.28E-07
323		0.00	0.000	0.001	0.2770	0.2332	0.0000	2.28E-07
324	*	0.00	0.000	0.000	0.2770	0.2332	0.0000	2.28E-07
325	*	0.00	0.000	0.000	0.2770	0.2331	0.0000	2.28E-07
326	*	0.00	0.000	0.000	0.2770	0.2330	0.0000	2.28E-07
327	*	0.00	0.000	0.000	0.2770	0.2330	0.0000	2.28E-07
328		0.00	0.000	0.000	0.2770	0.2330	0.0000	2.28E-07
329		0.00	0.000	0.000	0.2770	0.2331	0.0000	2.28E-07
330		0.02	0.000	0.015	0.2774	0.2330	0.0000	2.28E-07
331		0.00	0.000	0.002	0.2773	0.2329	0.0000	2.28E-07
332		0.00	0.000	0.002	0.2771	0.2329	0.0000	2.28E-07
333		0.40	0.215	0.042	0.2913	0.2328	0.0000	2.28E-07
334		0.01	0.000	0.015	0.2907	0.2327	0.0000	2.28E-07
335		0.00	0.000	0.012	0.2895	0.2327	0.0000	2.28E-07
336		0.04	0.000	0.031	0.2908	0.2326	0.0000	2.28E-07
337		0.00	0.000	0.012	0.2896	0.2325	0.0000	2.27E-07
338		0.04	0.000	0.028	0.2908	0.2325	0.0000	2.27E-07
339	*	0.00	0.000	0.009	0.2898	0.2324	0.0000	2.27E-07
340		0.00	0.000	0.007	0.2891	0.2324	0.0000	2.27E-07
341	*	0.00	0.000	0.009	0.2882	0.2324	0.0000	2.27E-07
342	*	0.00	0.000	0.000	0.2882	0.2323	0.0000	2.27E-07
343		0.00	0.000	0.009	0.2873	0.2322	0.0000	2.27E-07
344	*	0.33	0.000	0.031	0.2893	0.2322	0.0000	2.27E-07

345		0.00	0.099	0.053	0.3020	0.2321	0.0000	2.27E-07
346		0.21	0.063	0.049	0.3115	0.2320	0.0000	2.27E-07
347		0.06	0.000	0.041	0.3135	0.2320	0.0000	2.27E-07
348		0.00	0.000	0.027	0.3108	0.2319	0.0000	2.27E-07
349		0.00	0.000	0.032	0.3076	0.2318	0.0000	2.27E-07
350	*	0.00	0.000	0.020	0.3056	0.2318	0.0000	2.27E-07
351	*	0.00	0.000	0.017	0.3039	0.2317	0.0000	2.27E-07
352	*	0.00	0.000	0.000	0.3039	0.2316	0.0000	2.27E-07
353	*	0.00	0.000	0.000	0.3039	0.2315	0.0000	2.27E-07
354	*	0.00	0.000	0.000	0.3039	0.2315	0.0000	2.27E-07
355	*	0.00	0.000	0.000	0.3039	0.2314	0.0000	2.26E-07
356	*	0.00	0.000	0.000	0.3039	0.2313	0.0000	2.26E-07
357	*	0.00	0.000	0.000	0.3039	0.2313	0.0000	2.26E-07
358		0.30	0.106	0.059	0.3169	0.2312	0.0000	2.26E-07
359		0.00	0.000	0.049	0.3120	0.2311	0.0000	2.26E-07
360		0.00	0.000	0.056	0.3063	0.2311	0.0000	2.26E-07
361		0.00	0.000	0.102	0.2962	0.2310	0.0000	2.26E-07
362		0.00	0.000	0.107	0.2855	0.2309	0.0000	2.26E-07
363		0.00	0.000	0.044	0.2810	0.2309	0.0000	2.26E-07
364		0.00	0.000	0.032	0.2778	0.2308	0.0000	2.26E-07
365		0.00	0.000	0.007	0.2772	0.2307	0.0000	2.26E-07

* = Frozen (air or soil)

Annual Totals for Year 21			
	inches	cubic feet	percent
Precipitation	39.15	142,115.0	100.00
Runoff	23.255	84,415.9	59.40
Evapotranspiration	17.166	62,311.9	43.85
Recirculation into Layer 1	0.0099	36.1	0.03
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0099	36.1	0.03
Percolation/Leakage through Layer 5	0.000086	0.3105	0.00
Average Head on Top of Layer 4	0.2403	---	---
Change in Water Storage	-1.2708	-4,613.1	-3.25
Soil Water at Start of Year	1,407.3507	5,108,683.1	3594.75
Soil Water at End of Year	1,406.5409	5,105,743.3	3592.68
Snow Water at Start of Year	0.4610	1,673.3	1.18
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0099	-36.1	-0.03

Daily Output for Year 22

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.002	0.2770	0.2307	0.0000	2.26E-07
2			0.00	0.000	0.000	0.2770	0.2306	0.0000	2.26E-07
3			0.00	0.000	0.000	0.2770	0.2305	0.0000	2.26E-07
4			0.00	0.000	0.000	0.2770	0.2305	0.0000	2.26E-07
5			0.00	0.000	0.000	0.2770	0.2304	0.0000	2.26E-07
6	*		0.00	0.000	0.000	0.2770	0.2303	0.0000	2.25E-07
7			0.22	0.060	0.033	0.2897	0.2303	0.0000	2.25E-07
8	*		0.00	0.000	0.000	0.2897	0.2302	0.0000	2.25E-07
9	*		0.03	0.000	0.033	0.2897	0.2301	0.0000	2.25E-07
10	*		0.03	0.000	0.016	0.2908	0.2301	0.0000	2.25E-07
11	*		0.46	0.000	0.007	0.2928	0.2300	0.0000	2.25E-07
12	*		0.07	0.000	0.005	0.2947	0.2299	0.0000	2.25E-07
13	*		0.00	0.000	0.010	0.2967	0.2299	0.0000	2.25E-07
14	*		0.00	0.000	0.014	0.2987	0.2298	0.0000	2.25E-07
15	*		0.00	0.000	0.000	0.3006	0.2297	0.0000	2.25E-07
16			0.00	0.249	0.024	0.3134	0.2297	0.0000	2.25E-07
17			0.00	0.000	0.040	0.3094	0.2296	0.0000	2.25E-07
18			0.00	0.000	0.106	0.2987	0.2295	0.0000	2.25E-07
19			0.00	0.000	0.078	0.2909	0.2295	0.0000	2.25E-07
20			0.00	0.000	0.041	0.2868	0.2294	0.0000	2.25E-07
21			0.00	0.000	0.035	0.2833	0.2293	0.0000	2.25E-07
22			0.00	0.000	0.032	0.2801	0.2293	0.0000	2.25E-07
23			0.00	0.000	0.025	0.2776	0.2292	0.0000	2.24E-07
24			0.00	0.000	0.005	0.2771	0.2291	0.0000	2.24E-07

25	0.00	0.000	0.001	0.2770	0.2291	0.0000	2.24E-07
26	0.00	0.000	0.000	0.2770	0.2290	0.0000	2.24E-07
27	0.00	0.000	0.000	0.2770	0.2289	0.0000	2.24E-07
28	0.00	0.000	0.000	0.2770	0.2289	0.0000	2.24E-07
29	0.31	0.132	0.044	0.2900	0.2288	0.0000	2.24E-07
30	0.12	0.000	0.032	0.2992	0.2287	0.0000	2.24E-07
31	0.09	0.000	0.031	0.3048	0.2287	0.0000	2.24E-07
32	0.00	0.000	0.012	0.3036	0.2286	0.0000	2.24E-07
33	0.00	0.000	0.011	0.3025	0.2285	0.0000	2.24E-07
34	0.00	0.000	0.011	0.3013	0.2285	0.0000	2.24E-07
35	0.00	0.000	0.011	0.3003	0.2284	0.0000	2.24E-07
36	0.00	0.000	0.010	0.2992	0.2283	0.0000	2.24E-07
37	0.00	0.000	0.010	0.2982	0.2283	0.0000	2.24E-07
38	0.00	0.000	0.010	0.2972	0.2282	0.0000	2.24E-07
39	0.00	0.000	0.010	0.2963	0.2281	0.0000	2.24E-07
40	0.00	0.000	0.009	0.2953	0.2281	0.0000	2.23E-07
41	0.12	0.000	0.033	0.3037	0.2280	0.0000	2.23E-07
42	0.11	0.000	0.035	0.3111	0.2279	0.0000	2.23E-07
43	0.28	0.124	0.036	0.3232	0.2279	0.0000	2.23E-07
44	0.00	0.000	0.045	0.3187	0.2278	0.0000	2.23E-07
45	0.00	0.000	0.116	0.3071	0.2277	0.0000	2.23E-07
46	0.00	0.000	0.061	0.3010	0.2277	0.0000	2.23E-07
47	0.00	0.000	0.044	0.2966	0.2276	0.0000	2.23E-07
48	0.00	0.000	0.035	0.2931	0.2275	0.0000	2.23E-07
49	0.00	0.000	0.029	0.2902	0.2275	0.0000	2.23E-07
50	0.00	0.000	0.028	0.2874	0.2274	0.0000	2.23E-07
51	0.00	0.000	0.025	0.2849	0.2273	0.0000	2.23E-07
52	0.22	0.056	0.047	0.2962	0.2273	0.0000	2.23E-07
53	0.03	0.000	0.038	0.2951	0.2272	0.0000	2.23E-07
54	0.01	0.000	0.025	0.2931	0.2271	0.0000	2.23E-07
55	0.00	0.000	0.019	0.2912	0.2271	0.0000	2.23E-07
56	0.00	0.000	0.018	0.2894	0.2270	0.0000	2.23E-07

57	*	0.00	0.000	0.000	0.2894	0.2269	0.0000	2.22E-07
58	*	0.00	0.000	0.019	0.2875	0.2269	0.0000	2.22E-07
59	*	0.00	0.000	0.000	0.2875	0.2268	0.0000	2.22E-07
60		0.00	0.000	0.017	0.2858	0.2267	0.0000	2.22E-07
61		0.00	0.000	0.014	0.2845	0.2267	0.0000	2.22E-07
62		0.00	0.000	0.012	0.2833	0.2266	0.0000	2.22E-07
63		0.00	0.000	0.011	0.2822	0.2265	0.0000	2.22E-07
64		0.01	0.000	0.019	0.2813	0.2265	0.0000	2.22E-07
65		0.02	0.000	0.027	0.2808	0.2264	0.0000	2.22E-07
66		0.00	0.000	0.012	0.2796	0.2263	0.0000	2.22E-07
67		0.30	0.121	0.039	0.2933	0.2263	0.0000	2.22E-07
68	*	0.10	0.000	0.042	0.2952	0.2262	0.0000	2.22E-07
69	*	0.51	0.000	0.000	0.2972	0.2261	0.0000	2.22E-07
70		0.00	0.328	0.073	0.3099	0.2261	0.0000	2.22E-07
71		0.00	0.000	0.083	0.3017	0.2260	0.0000	2.22E-07
72	*	0.43	0.000	0.046	0.3037	0.2259	0.0000	2.22E-07
73		0.00	0.064	0.169	0.3164	0.2259	0.0000	2.21E-07
74		0.00	0.000	0.082	0.3082	0.2258	0.0000	2.21E-07
75		0.05	0.000	0.109	0.3020	0.2257	0.0000	2.21E-07
76		0.00	0.000	0.100	0.2920	0.2257	0.0000	2.21E-07
77		0.02	0.000	0.047	0.2888	0.2256	0.0000	2.21E-07
78		0.36	0.153	0.066	0.3027	0.2255	0.0000	2.21E-07
79		0.00	0.000	0.175	0.2853	0.2255	0.0000	2.21E-07
80		0.00	0.000	0.031	0.2822	0.2254	0.0000	2.21E-07
81		0.00	0.000	0.028	0.2793	0.2253	0.0000	2.21E-07
82		0.15	0.000	0.048	0.2897	0.2253	0.0000	2.21E-07
83		0.01	0.000	0.023	0.2883	0.2252	0.0000	2.21E-07
84		0.31	0.124	0.049	0.3019	0.2251	0.0000	2.21E-07
85		0.09	0.000	0.101	0.3012	0.2251	0.0000	2.21E-07
86		0.13	0.001	0.040	0.3101	0.2250	0.0000	2.21E-07
87		1.75	1.528	0.088	0.3231	0.2249	0.0000	2.21E-07
88		2.20	1.976	0.107	0.3347	0.2249	0.0000	2.21E-07

89		0.11	0.010	0.079	0.3369	0.2248	0.0000	2.21E-07
90		0.01	0.000	0.045	0.3336	0.2247	0.0000	2.20E-07
91		0.00	0.000	0.105	0.3231	0.2247	0.0000	2.20E-07
92		0.00	0.000	0.109	0.3122	0.2246	0.0000	2.20E-07
93		0.00	0.000	0.065	0.3058	0.2245	0.0000	2.20E-07
94		0.02	0.000	0.189	0.2894	0.2245	0.0000	2.20E-07
95		0.07	0.000	0.131	0.2834	0.2244	0.0000	2.20E-07
96		0.00	0.000	0.027	0.2807	0.2244	0.0000	2.20E-07
97		0.00	0.000	0.018	0.2789	0.2243	0.0000	2.20E-07
98		0.00	0.000	0.007	0.2782	0.2242	0.0000	2.20E-07
99		0.00	0.000	0.007	0.2775	0.2242	0.0000	2.20E-07
100		0.00	0.000	0.004	0.2771	0.2241	0.0000	2.20E-07
101		0.43	0.231	0.050	0.2915	0.2240	0.0000	2.20E-07
102		0.00	0.000	0.011	0.2904	0.2240	0.0000	2.20E-07
103		0.00	0.000	0.016	0.2889	0.2239	0.0000	2.20E-07
104		0.00	0.000	0.015	0.2874	0.2239	0.0000	2.20E-07
105		0.00	0.000	0.014	0.2860	0.2238	0.0000	2.20E-07
106		0.00	0.000	0.014	0.2846	0.2237	0.0000	2.20E-07
107		0.00	0.000	0.013	0.2832	0.2237	0.0000	2.20E-07
108		0.00	0.000	0.013	0.2819	0.2236	0.0000	2.19E-07
109		0.00	0.000	0.013	0.2807	0.2235	0.0000	2.19E-07
110		0.00	0.000	0.013	0.2794	0.2235	0.0000	2.19E-07
111		0.00	0.000	0.015	0.2779	0.2234	0.0000	2.19E-07
112		0.00	0.000	0.009	0.2770	0.2233	0.0000	2.19E-07
113		0.00	0.000	0.000	0.2770	0.2233	0.0000	2.19E-07
114		0.89	0.687	0.040	0.2933	0.2232	0.0000	2.19E-07
115	*	0.00	0.000	0.025	0.2908	0.2231	0.0000	2.19E-07
116		0.78	0.477	0.165	0.3050	0.2231	0.0000	2.19E-07
117		0.36	0.161	0.150	0.3103	0.2230	0.0000	2.19E-07
118		0.00	0.000	0.094	0.3009	0.2229	0.0000	2.19E-07
119		0.00	0.000	0.073	0.2935	0.2229	0.0000	2.19E-07
120		0.01	0.000	0.113	0.2835	0.2228	0.0000	2.19E-07

121	0.04	0.000	0.071	0.2809	0.2227	0.0000	2.19E-07
122	0.28	0.098	0.091	0.2904	0.2227	0.0000	2.19E-07
123	0.57	0.369	0.084	0.3019	0.2226	0.0000	2.19E-07
124	0.00	0.000	0.065	0.2953	0.2225	0.0000	2.19E-07
125	0.00	0.000	0.122	0.2832	0.2226	0.0000	2.19E-07
126	0.00	0.000	0.047	0.2785	0.2225	0.0000	2.19E-07
127	0.00	0.000	0.012	0.2772	0.2225	0.0000	2.18E-07
128	0.00	0.000	0.002	0.2771	0.2224	0.0000	2.18E-07
129	0.00	0.000	0.001	0.2770	0.2223	0.0000	2.18E-07
130	0.00	0.000	0.000	0.2770	0.2223	0.0000	2.18E-07
131	0.00	0.000	0.000	0.2770	0.2222	0.0000	2.18E-07
132	0.00	0.000	0.000	0.2770	0.2221	0.0000	2.18E-07
133	0.21	0.054	0.037	0.2894	0.2221	0.0000	2.18E-07
134	0.05	0.000	0.033	0.2910	0.2220	0.0000	2.18E-07
135	0.00	0.000	0.016	0.2894	0.2219	0.0000	2.18E-07
136	0.00	0.000	0.013	0.2880	0.2219	0.0000	2.18E-07
137	0.02	0.000	0.031	0.2874	0.2218	0.0000	2.18E-07
138	0.07	0.000	0.039	0.2907	0.2218	0.0000	2.18E-07
139	0.63	0.448	0.046	0.3043	0.2217	0.0000	2.18E-07
140	0.05	0.000	0.060	0.3036	0.2216	0.0000	2.18E-07
141	1.22	1.008	0.087	0.3161	0.2216	0.0000	2.18E-07
142	0.00	0.000	0.097	0.3065	0.2215	0.0000	2.18E-07
143	0.08	0.000	0.072	0.3069	0.2214	0.0000	2.18E-07
144	0.00	0.000	0.168	0.2902	0.2214	0.0000	2.17E-07
145	0.14	0.000	0.164	0.2882	0.2213	0.0000	2.17E-07
146	0.18	0.013	0.094	0.2954	0.2212	0.0000	2.17E-07
147	0.79	0.592	0.084	0.3066	0.2212	0.0000	2.17E-07
148	0.00	0.000	0.109	0.2957	0.2211	0.0000	2.17E-07
149	0.00	0.000	0.160	0.2798	0.2210	0.0000	2.17E-07
150	0.00	0.000	0.021	0.2777	0.2210	0.0000	2.17E-07
151	0.00	0.000	0.005	0.2772	0.2209	0.0000	2.17E-07
152	2.23	1.999	0.071	0.2930	0.2208	0.0000	2.17E-07

153	0.47	0.170	0.272	0.2955	0.2208	0.0000	2.17E-07
154	0.10	0.000	0.063	0.2993	0.2207	0.0000	2.17E-07
155	0.47	0.228	0.112	0.3124	0.2207	0.0000	2.17E-07
156	0.00	0.000	0.178	0.2946	0.2206	0.0000	2.17E-07
157	0.00	0.000	0.157	0.2790	0.2205	0.0000	2.17E-07
158	0.03	0.000	0.040	0.2776	0.2205	0.0000	2.17E-07
159	0.03	0.000	0.036	0.2772	0.2204	0.0000	2.17E-07
160	0.05	0.000	0.029	0.2789	0.2203	0.0000	2.17E-07
161	0.00	0.000	0.008	0.2784	0.2203	0.0000	2.16E-07
162	0.00	0.000	0.009	0.2775	0.2202	0.0000	2.16E-07
163	0.00	0.000	0.004	0.2771	0.2201	0.0000	2.16E-07
164	0.16	0.000	0.039	0.2891	0.2201	0.0000	2.16E-07
165	0.06	0.000	0.036	0.2913	0.2200	0.0000	2.16E-07
166	1.06	0.875	0.055	0.3046	0.2199	0.0000	2.16E-07
167	0.25	0.101	0.071	0.3125	0.2199	0.0000	2.16E-07
168	0.00	0.000	0.137	0.2988	0.2198	0.0000	2.16E-07
169	0.00	0.000	0.154	0.2834	0.2198	0.0000	2.16E-07
170	0.00	0.000	0.048	0.2786	0.2197	0.0000	2.16E-07
171	0.00	0.000	0.012	0.2774	0.2196	0.0000	2.16E-07
172	0.00	0.000	0.003	0.2771	0.2196	0.0000	2.16E-07
173	0.00	0.000	0.001	0.2770	0.2195	0.0000	2.16E-07
174	0.00	0.000	0.000	0.2770	0.2194	0.0000	2.16E-07
175	0.00	0.000	0.000	0.2770	0.2194	0.0000	2.16E-07
176	0.00	0.000	0.000	0.2770	0.2193	0.0000	2.16E-07
177	0.00	0.000	0.000	0.2770	0.2192	0.0000	2.16E-07
178	0.00	0.000	0.000	0.2770	0.2192	0.0000	2.15E-07
179	0.00	0.000	0.000	0.2770	0.2191	0.0000	2.15E-07
180	0.00	0.000	0.000	0.2770	0.2190	0.0000	2.15E-07
181	0.00	0.000	0.000	0.2770	0.2190	0.0000	2.15E-07
182	0.00	0.000	0.000	0.2770	0.2189	0.0000	2.15E-07
183	0.00	0.000	0.000	0.2770	0.2189	0.0000	2.15E-07
184	0.00	0.000	0.000	0.2770	0.2188	0.0000	2.15E-07

185	0.00	0.000	0.000	0.2770	0.2187	0.0000	2.15E-07
186	0.00	0.000	0.000	0.2770	0.2187	0.0000	2.15E-07
187	0.39	0.203	0.043	0.2909	0.2186	0.0000	2.15E-07
188	0.11	0.000	0.034	0.2990	0.2185	0.0000	2.15E-07
189	0.14	0.001	0.037	0.3089	0.2185	0.0000	2.15E-07
190	0.26	0.105	0.043	0.3204	0.2184	0.0000	2.15E-07
191	0.07	0.000	0.235	0.3043	0.2184	0.0000	2.15E-07
192	0.00	0.000	0.020	0.3023	0.2183	0.0000	2.15E-07
193	0.01	0.000	0.027	0.3010	0.2182	0.0000	2.15E-07
194	0.68	0.501	0.043	0.3145	0.2182	0.0000	2.15E-07
195	0.00	0.000	0.194	0.2951	0.2181	0.0000	2.15E-07
196	0.00	0.000	0.023	0.2928	0.2180	0.0000	2.14E-07
197	0.00	0.000	0.021	0.2907	0.2180	0.0000	2.14E-07
198	0.00	0.000	0.016	0.2890	0.2179	0.0000	2.14E-07
199	0.00	0.000	0.019	0.2872	0.2178	0.0000	2.14E-07
200	0.00	0.000	0.022	0.2850	0.2178	0.0000	2.14E-07
201	0.60	0.403	0.046	0.3004	0.2177	0.0000	2.14E-07
202	0.00	0.000	0.105	0.2898	0.2177	0.0000	2.14E-07
203	0.92	0.534	0.243	0.3039	0.2176	0.0000	2.14E-07
204	0.85	0.504	0.235	0.3147	0.2175	0.0000	2.14E-07
205	0.90	0.574	0.261	0.3208	0.2175	0.0000	2.14E-07
206	0.00	0.000	0.173	0.3034	0.2174	0.0000	2.14E-07
207	0.00	0.000	0.191	0.2843	0.2174	0.0000	2.14E-07
208	0.00	0.000	0.054	0.2789	0.2173	0.0000	2.14E-07
209	0.00	0.000	0.014	0.2775	0.2172	0.0000	2.14E-07
210	0.00	0.000	0.004	0.2771	0.2172	0.0000	2.14E-07
211	0.00	0.000	0.001	0.2770	0.2171	0.0000	2.14E-07
212	0.00	0.000	0.000	0.2770	0.2170	0.0000	2.14E-07
213	0.01	0.000	0.005	0.2770	0.2170	0.0000	2.14E-07
214	0.02	0.000	0.019	0.2774	0.2169	0.0000	2.13E-07
215	0.79	0.578	0.058	0.2928	0.2168	0.0000	2.13E-07
216	0.00	0.000	0.103	0.2825	0.2168	0.0000	2.13E-07

217	0.03	0.000	0.040	0.2818	0.2167	0.0000	2.13E-07
218	0.52	0.321	0.054	0.2964	0.2167	0.0000	2.13E-07
219	0.14	0.000	0.174	0.2926	0.2166	0.0000	2.13E-07
220	0.33	0.153	0.057	0.3048	0.2165	0.0000	2.13E-07
221	0.00	0.000	0.108	0.2939	0.2165	0.0000	2.13E-07
222	0.14	0.000	0.048	0.3027	0.2164	0.0000	2.13E-07
223	0.03	0.000	0.088	0.2969	0.2163	0.0000	2.13E-07
224	0.38	0.204	0.054	0.3093	0.2163	0.0000	2.13E-07
225	0.00	0.000	0.186	0.2908	0.2162	0.0000	2.13E-07
226	0.00	0.000	0.028	0.2880	0.2162	0.0000	2.13E-07
227	0.00	0.000	0.027	0.2853	0.2161	0.0000	2.13E-07
228	0.00	0.000	0.027	0.2829	0.2160	0.0000	2.13E-07
229	0.07	0.000	0.049	0.2854	0.2160	0.0000	2.13E-07
230	0.00	0.000	0.023	0.2831	0.2159	0.0000	2.13E-07
231	0.00	0.000	0.031	0.2800	0.2158	0.0000	2.13E-07
232	0.51	0.320	0.050	0.2939	0.2158	0.0000	2.12E-07
233	0.44	0.159	0.260	0.2963	0.2157	0.0000	2.12E-07
234	0.07	0.000	0.068	0.2967	0.2156	0.0000	2.12E-07
235	0.00	0.000	0.106	0.2862	0.2156	0.0000	2.12E-07
236	0.00	0.000	0.069	0.2793	0.2155	0.0000	2.12E-07
237	0.64	0.345	0.169	0.2923	0.2155	0.0000	2.12E-07
238	0.38	0.131	0.179	0.2997	0.2154	0.0000	2.12E-07
239	0.00	0.000	0.108	0.2889	0.2153	0.0000	2.12E-07
240	0.00	0.000	0.091	0.2798	0.2157	0.0000	2.12E-07
241	0.00	0.000	0.021	0.2777	0.2159	0.0000	2.13E-07
242	0.00	0.000	0.005	0.2772	0.2158	0.0000	2.12E-07
243	0.00	0.000	0.001	0.2770	0.2158	0.0000	2.12E-07
244	0.00	0.000	0.000	0.2770	0.2157	0.0000	2.12E-07
245	0.00	0.000	0.000	0.2770	0.2156	0.0000	2.12E-07
246	0.00	0.000	0.000	0.2770	0.2156	0.0000	2.12E-07
247	0.06	0.000	0.026	0.2800	0.2155	0.0000	2.12E-07
248	0.03	0.000	0.022	0.2809	0.2154	0.0000	2.12E-07

249	0.93	0.748	0.053	0.2935	0.2154	0.0000	2.12E-07
250	0.00	0.000	0.069	0.2866	0.2153	0.0000	2.12E-07
251	1.24	1.041	0.056	0.3009	0.2153	0.0000	2.12E-07
252	0.00	0.000	0.117	0.2891	0.2152	0.0000	2.12E-07
253	0.00	0.000	0.081	0.2811	0.2151	0.0000	2.12E-07
254	0.96	0.690	0.110	0.2969	0.2151	0.0000	2.12E-07
255	0.26	0.093	0.091	0.3043	0.2150	0.0000	2.12E-07
256	0.30	0.118	0.149	0.3075	0.2149	0.0000	2.12E-07
257	0.58	0.308	0.233	0.3118	0.2149	0.0000	2.12E-07
258	0.07	0.000	0.086	0.3100	0.2148	0.0000	2.12E-07
259	0.06	0.000	0.145	0.3018	0.2148	0.0000	2.12E-07
260	0.45	0.168	0.196	0.3101	0.2147	0.0000	2.11E-07
261	0.70	0.505	0.078	0.3215	0.2146	0.0000	2.11E-07
262	0.00	0.000	0.055	0.3160	0.2146	0.0000	2.11E-07
263	0.25	0.081	0.083	0.3245	0.2145	0.0000	2.11E-07
264	0.03	0.000	0.068	0.3212	0.2144	0.0000	2.11E-07
265	0.54	0.333	0.070	0.3345	0.2144	0.0000	2.11E-07
266	0.00	0.000	0.130	0.3215	0.2143	0.0000	2.11E-07
267	0.00	0.000	0.049	0.3166	0.2143	0.0000	2.11E-07
268	0.00	0.000	0.127	0.3040	0.2142	0.0000	2.11E-07
269	0.00	0.000	0.151	0.2889	0.2141	0.0000	2.11E-07
270	0.00	0.000	0.111	0.2777	0.2141	0.0000	2.11E-07
271	0.00	0.000	0.005	0.2772	0.2140	0.0000	2.11E-07
272	0.00	0.000	0.002	0.2770	0.2139	0.0000	2.11E-07
273	0.00	0.000	0.000	0.2770	0.2139	0.0000	2.11E-07
274	0.00	0.000	0.000	0.2770	0.2138	0.0000	2.11E-07
275	0.00	0.000	0.000	0.2770	0.2138	0.0000	2.11E-07
276	0.00	0.000	0.000	0.2770	0.2137	0.0000	2.11E-07
277	0.00	0.000	0.000	0.2770	0.2136	0.0000	2.11E-07
278	0.01	0.000	0.005	0.2770	0.2136	0.0000	2.10E-07
279	0.82	0.604	0.050	0.2933	0.2135	0.0000	2.10E-07
280	0.00	0.000	0.009	0.2923	0.2134	0.0000	2.10E-07

281		0.00	0.000	0.014	0.2909	0.2134	0.0000	2.10E-07
282		0.03	0.000	0.032	0.2907	0.2133	0.0000	2.10E-07
283		0.00	0.000	0.013	0.2894	0.2133	0.0000	2.10E-07
284		0.00	0.000	0.015	0.2879	0.2132	0.0000	2.10E-07
285		0.00	0.000	0.013	0.2866	0.2131	0.0000	2.10E-07
286		0.05	0.000	0.034	0.2878	0.2131	0.0000	2.10E-07
287		0.00	0.000	0.012	0.2866	0.2130	0.0000	2.10E-07
288		0.00	0.000	0.008	0.2858	0.2129	0.0000	2.10E-07
289		0.08	0.000	0.035	0.2907	0.2129	0.0000	2.10E-07
290		0.00	0.000	0.007	0.2899	0.2128	0.0000	2.10E-07
291		0.00	0.000	0.009	0.2890	0.2128	0.0000	2.10E-07
292		0.00	0.000	0.010	0.2881	0.2127	0.0000	2.10E-07
293		0.00	0.000	0.009	0.2872	0.2126	0.0000	2.10E-07
294		0.00	0.000	0.009	0.2863	0.2126	0.0000	2.10E-07
295		0.00	0.000	0.009	0.2854	0.2125	0.0000	2.10E-07
296		0.00	0.000	0.009	0.2845	0.2124	0.0000	2.09E-07
297		0.00	0.000	0.009	0.2837	0.2124	0.0000	2.09E-07
298		0.00	0.000	0.008	0.2828	0.2123	0.0000	2.09E-07
299		0.00	0.000	0.008	0.2820	0.2123	0.0000	2.09E-07
300	*	0.00	0.000	0.000	0.2820	0.2122	0.0000	2.09E-07
301		0.00	0.000	0.008	0.2812	0.2121	0.0000	2.09E-07
302		0.00	0.000	0.008	0.2804	0.2121	0.0000	2.09E-07
303		0.00	0.000	0.008	0.2796	0.2120	0.0000	2.09E-07
304		0.01	0.000	0.013	0.2789	0.2120	0.0000	2.09E-07
305		0.02	0.000	0.021	0.2787	0.2119	0.0000	2.09E-07
306		0.02	0.000	0.025	0.2787	0.2118	0.0000	2.09E-07
307	*	0.15	0.000	0.048	0.2807	0.2118	0.0000	2.09E-07
308		0.00	0.000	0.081	0.2807	0.2117	0.0000	2.09E-07
309		0.06	0.000	0.031	0.2840	0.2117	0.0000	2.09E-07
310		0.00	0.000	0.007	0.2833	0.2116	0.0000	2.09E-07
311		0.00	0.000	0.005	0.2828	0.2115	0.0000	2.09E-07
312		0.00	0.000	0.007	0.2821	0.2115	0.0000	2.09E-07

313		0.06	0.000	0.031	0.2851	0.2114	0.0000	2.09E-07
314		0.00	0.000	0.006	0.2845	0.2113	0.0000	2.08E-07
315		0.00	0.000	0.005	0.2840	0.2113	0.0000	2.08E-07
316		0.00	0.000	0.009	0.2834	0.2112	0.0000	2.08E-07
317		0.00	0.000	0.007	0.2827	0.2112	0.0000	2.08E-07
318		0.00	0.000	0.007	0.2820	0.2111	0.0000	2.08E-07
319		0.23	0.071	0.034	0.2948	0.2110	0.0000	2.08E-07
320		0.00	0.000	0.006	0.2944	0.2110	0.0000	2.08E-07
321		0.00	0.000	0.006	0.2937	0.2109	0.0000	2.08E-07
322		0.00	0.000	0.006	0.2931	0.2108	0.0000	2.08E-07
323		0.00	0.000	0.006	0.2925	0.2108	0.0000	2.08E-07
324	*	0.00	0.000	0.006	0.2919	0.2107	0.0000	2.08E-07
325	*	0.00	0.000	0.006	0.2912	0.2107	0.0000	2.08E-07
326	*	0.06	0.000	0.023	0.2932	0.2106	0.0000	2.08E-07
327	*	0.00	0.000	0.015	0.2932	0.2105	0.0000	2.08E-07
328	*	0.00	0.000	0.000	0.2932	0.2105	0.0000	2.08E-07
329	*	0.00	0.000	0.000	0.2932	0.2104	0.0000	2.08E-07
330	*	0.00	0.000	0.000	0.2932	0.2104	0.0000	2.08E-07
331	*	0.00	0.000	0.000	0.2932	0.2103	0.0000	2.08E-07
332	*	0.00	0.000	0.000	0.2932	0.2102	0.0000	2.07E-07
333	*	0.00	0.000	0.004	0.2932	0.2102	0.0000	2.07E-07
334	*	0.00	0.000	0.006	0.2926	0.2101	0.0000	2.07E-07
335	*	0.00	0.000	0.000	0.2926	0.2100	0.0000	2.07E-07
336	*	0.00	0.000	0.006	0.2920	0.2100	0.0000	2.07E-07
337		0.00	0.000	0.006	0.2914	0.2099	0.0000	2.07E-07
338		0.00	0.000	0.007	0.2909	0.2099	0.0000	2.07E-07
339		0.14	0.000	0.032	0.3018	0.2098	0.0000	2.07E-07
340		0.00	0.000	0.007	0.3011	0.2097	0.0000	2.07E-07
341		0.00	0.000	0.006	0.3005	0.2097	0.0000	2.07E-07
342		0.00	0.000	0.006	0.2999	0.2096	0.0000	2.07E-07
343		0.00	0.000	0.009	0.2994	0.2096	0.0000	2.07E-07
344		0.00	0.000	0.006	0.2988	0.2095	0.0000	2.07E-07

345	*		0.00	0.000	0.006	0.2982	0.2094	0.0000	2.07E-07
346	*		0.00	0.000	0.000	0.2982	0.2094	0.0000	2.07E-07
347	*		0.00	0.000	0.000	0.2983	0.2093	0.0000	2.07E-07
348	*		0.00	0.000	0.000	0.2983	0.2093	0.0000	2.07E-07
349	*	*	0.00	0.000	0.000	0.2983	0.2092	0.0000	2.07E-07
350	*	*	0.00	0.000	0.000	0.2983	0.2091	0.0000	2.06E-07
351		*	0.00	0.000	0.000	0.2983	0.2091	0.0000	2.06E-07
352	*	*	0.00	0.000	0.000	0.2983	0.2090	0.0000	2.06E-07
353	*	*	0.00	0.000	0.000	0.2983	0.2090	0.0000	2.06E-07
354		*	0.00	0.000	0.000	0.2983	0.2089	0.0000	2.06E-07
355	*	*	0.00	0.000	0.000	0.2983	0.2088	0.0000	2.06E-07
356		*	0.00	0.000	0.000	0.2983	0.2088	0.0000	2.06E-07
357		*	0.28	0.200	0.026	0.3032	0.2087	0.0000	2.06E-07
358			0.00	0.000	0.031	0.3001	0.2086	0.0000	2.06E-07
359			0.01	0.000	0.013	0.2995	0.2086	0.0000	2.06E-07
360			0.18	0.026	0.033	0.3121	0.2085	0.0000	2.06E-07
361			0.00	0.000	0.067	0.3057	0.2085	0.0000	2.06E-07
362			0.00	0.000	0.058	0.2999	0.2084	0.0000	2.06E-07
363			0.00	0.000	0.038	0.2961	0.2083	0.0000	2.06E-07
364	*		0.00	0.000	0.000	0.2961	0.2083	0.0000	2.06E-07
365			0.00	0.000	0.035	0.2926	0.2082	0.0000	2.06E-07

* = Frozen (air or soil)

Annual Totals for Year 22			
	inches	cubic feet	percent
Precipitation	38.57	140,026.1	100.00
Runoff	22.460	81,530.9	58.23
Evapotranspiration	15.968	57,962.7	41.39
Recirculation into Layer 1	0.0091	32.9	0.02
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0091	32.9	0.02
Percolation/Leakage through Layer 5	0.000079	0.2855	0.00
Average Head on Top of Layer 4	0.2192	---	---
Change in Water Storage	0.1466	532.3	0.38
Soil Water at Start of Year	1,406.5409	5,105,743.3	3646.28
Soil Water at End of Year	1,406.6875	5,106,275.6	3646.66
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0091	-32.9	-0.02

Daily Output for Year 23

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.034	0.2892	0.2082	0.0000	2.06E-07
2			0.00	0.000	0.029	0.2863	0.2081	0.0000	2.06E-07
3			0.00	0.000	0.025	0.2838	0.2080	0.0000	2.05E-07
4			0.00	0.000	0.024	0.2814	0.2080	0.0000	2.05E-07
5			0.00	0.000	0.023	0.2791	0.2079	0.0000	2.05E-07
6	*		0.00	0.000	0.019	0.2772	0.2079	0.0000	2.05E-07
7	*		0.00	0.000	0.000	0.2772	0.2078	0.0000	2.05E-07
8			0.00	0.000	0.002	0.2771	0.2077	0.0000	2.05E-07
9	*		0.00	0.000	0.001	0.2770	0.2077	0.0000	2.05E-07
10			0.00	0.000	0.000	0.2770	0.2076	0.0000	2.05E-07
11	*		0.47	0.000	0.035	0.2790	0.2076	0.0000	2.05E-07
12	*		0.01	0.000	0.034	0.2809	0.2075	0.0000	2.05E-07
13			0.00	0.139	0.030	0.2936	0.2074	0.0000	2.05E-07
14	*		0.00	0.000	0.035	0.2956	0.2074	0.0000	2.05E-07
15			0.04	0.000	0.071	0.2950	0.2073	0.0000	2.05E-07
16	*		0.00	0.000	0.013	0.2938	0.2072	0.0000	2.05E-07
17			0.00	0.000	0.012	0.2926	0.2072	0.0000	2.05E-07
18			0.00	0.000	0.011	0.2914	0.2071	0.0000	2.05E-07
19			0.16	0.009	0.037	0.3029	0.2071	0.0000	2.05E-07
20			0.00	0.000	0.013	0.3016	0.2070	0.0000	2.05E-07
21			0.00	0.000	0.012	0.3004	0.2069	0.0000	2.04E-07
22	*		0.00	0.000	0.010	0.2994	0.2069	0.0000	2.04E-07
23	*		0.00	0.000	0.010	0.2984	0.2068	0.0000	2.04E-07
24			0.00	0.000	0.010	0.2974	0.2068	0.0000	2.04E-07

25		0.00	0.000	0.009	0.2965	0.2067	0.0000	2.04E-07
26		0.00	0.000	0.009	0.2955	0.2066	0.0000	2.04E-07
27		0.00	0.000	0.009	0.2946	0.2066	0.0000	2.04E-07
28		0.00	0.000	0.009	0.2938	0.2065	0.0000	2.04E-07
29		0.00	0.000	0.009	0.2929	0.2065	0.0000	2.04E-07
30		0.00	0.000	0.008	0.2921	0.2064	0.0000	2.04E-07
31		0.00	0.000	0.008	0.2912	0.2063	0.0000	2.04E-07
32		0.00	0.000	0.008	0.2904	0.2063	0.0000	2.04E-07
33		0.02	0.000	0.023	0.2903	0.2062	0.0000	2.04E-07
34		0.00	0.000	0.010	0.2894	0.2062	0.0000	2.04E-07
35		0.00	0.000	0.009	0.2885	0.2061	0.0000	2.04E-07
36		0.00	0.000	0.008	0.2877	0.2060	0.0000	2.04E-07
37	*	0.00	0.000	0.000	0.2877	0.2060	0.0000	2.04E-07
38	*	0.51	0.000	0.016	0.2896	0.2059	0.0000	2.04E-07
39	*	0.25	0.000	0.008	0.2916	0.2059	0.0000	2.04E-07
40		0.00	0.000	0.000	0.2936	0.2058	0.0000	2.03E-07
41		0.03	0.358	0.000	0.3063	0.2057	0.0000	2.03E-07
42		0.05	0.067	0.083	0.3179	0.2057	0.0000	2.03E-07
43		0.54	0.361	0.065	0.3296	0.2056	0.0000	2.03E-07
44		0.05	0.000	0.052	0.3294	0.2056	0.0000	2.03E-07
45		0.00	0.000	0.032	0.3261	0.2055	0.0000	2.03E-07
46		0.00	0.000	0.026	0.3236	0.2054	0.0000	2.03E-07
47		0.00	0.000	0.044	0.3192	0.2054	0.0000	2.03E-07
48		0.00	0.000	0.080	0.3113	0.2053	0.0000	2.03E-07
49		0.00	0.000	0.074	0.3039	0.2053	0.0000	2.03E-07
50		0.00	0.000	0.059	0.2980	0.2052	0.0000	2.03E-07
51		0.00	0.000	0.060	0.2920	0.2051	0.0000	2.03E-07
52		0.00	0.000	0.071	0.2849	0.2051	0.0000	2.03E-07
53		0.00	0.000	0.042	0.2807	0.2050	0.0000	2.03E-07
54		0.00	0.000	0.032	0.2775	0.2050	0.0000	2.03E-07
55	*	0.00	0.000	0.000	0.2775	0.2049	0.0000	2.03E-07
56	*	0.00	0.000	0.000	0.2775	0.2048	0.0000	2.03E-07

57	0.00	0.000	0.004	0.2771	0.2048	0.0000	2.03E-07
58	0.00	0.000	0.001	0.2770	0.2047	0.0000	2.02E-07
59	0.00	0.000	0.000	0.2770	0.2047	0.0000	2.02E-07
60	0.00	0.000	0.000	0.2770	0.2046	0.0000	2.02E-07
61	0.35	0.160	0.054	0.2904	0.2045	0.0000	2.02E-07
62	0.00	0.000	0.031	0.2873	0.2045	0.0000	2.02E-07
63	0.00	0.000	0.017	0.2856	0.2044	0.0000	2.02E-07
64	0.00	0.000	0.016	0.2840	0.2044	0.0000	2.02E-07
65	0.00	0.000	0.015	0.2825	0.2043	0.0000	2.02E-07
66	0.00	0.000	0.014	0.2811	0.2043	0.0000	2.02E-07
67	0.00	0.000	0.013	0.2797	0.2042	0.0000	2.02E-07
68	0.00	0.000	0.012	0.2785	0.2041	0.0000	2.02E-07
69	0.00	0.000	0.013	0.2772	0.2041	0.0000	2.02E-07
70	0.00	0.000	0.002	0.2771	0.2040	0.0000	2.02E-07
71	0.04	0.000	0.023	0.2789	0.2040	0.0000	2.02E-07
72	0.02	0.000	0.017	0.2796	0.2039	0.0000	2.02E-07
73	0.00	0.000	0.001	0.2795	0.2038	0.0000	2.02E-07
74	0.00	0.000	0.004	0.2790	0.2038	0.0000	2.02E-07
75	0.57	0.385	0.041	0.2935	0.2037	0.0000	2.02E-07
76	0.01	0.000	0.055	0.2893	0.2037	0.0000	2.02E-07
77	0.02	0.000	0.076	0.2842	0.2036	0.0000	2.01E-07
78	0.00	0.000	0.060	0.2782	0.2035	0.0000	2.01E-07
79	0.00	0.000	0.009	0.2773	0.2035	0.0000	2.01E-07
80	0.00	0.000	0.002	0.2771	0.2034	0.0000	2.01E-07
81	0.00	0.000	0.001	0.2770	0.2034	0.0000	2.01E-07
82	0.00	0.000	0.000	0.2770	0.2033	0.0000	2.01E-07
83	0.00	0.000	0.000	0.2770	0.2032	0.0000	2.01E-07
84	0.00	0.000	0.000	0.2770	0.2032	0.0000	2.01E-07
85	0.00	0.000	0.000	0.2770	0.2031	0.0000	2.01E-07
86	0.00	0.000	0.000	0.2770	0.2031	0.0000	2.01E-07
87	0.00	0.000	0.000	0.2770	0.2030	0.0000	2.01E-07
88	0.00	0.000	0.000	0.2770	0.2029	0.0000	2.01E-07

89		0.00	0.000	0.004	0.2770	0.2029	0.0000	2.01E-07
90		0.05	0.000	0.024	0.2796	0.2028	0.0000	2.01E-07
91	*	0.77	0.000	0.037	0.2815	0.2028	0.0000	2.01E-07
92	*	0.00	0.000	0.025	0.2835	0.2027	0.0000	2.01E-07
93	*	0.00	0.000	0.031	0.2855	0.2026	0.0000	2.01E-07
94	*	0.05	0.000	0.016	0.2874	0.2026	0.0000	2.01E-07
95	*	0.00	0.000	0.044	0.2894	0.2025	0.0000	2.01E-07
96		0.00	0.402	0.042	0.3021	0.2025	0.0000	2.00E-07
97		0.00	0.000	0.008	0.3014	0.2024	0.0000	2.00E-07
98		0.00	0.000	0.012	0.3002	0.2023	0.0000	2.00E-07
99		0.00	0.000	0.011	0.2991	0.2023	0.0000	2.00E-07
100		0.00	0.000	0.011	0.2980	0.2022	0.0000	2.00E-07
101		0.00	0.000	0.011	0.2970	0.2022	0.0000	2.00E-07
102		0.69	0.512	0.041	0.3110	0.2021	0.0000	2.00E-07
103		0.11	0.001	0.141	0.3077	0.2021	0.0000	2.00E-07
104		0.01	0.000	0.175	0.2909	0.2020	0.0000	2.00E-07
105		0.32	0.128	0.151	0.2951	0.2019	0.0000	2.00E-07
106		0.00	0.000	0.117	0.2834	0.2019	0.0000	2.00E-07
107		0.00	0.000	0.039	0.2795	0.2018	0.0000	2.00E-07
108		0.00	0.000	0.021	0.2774	0.2018	0.0000	2.00E-07
109		0.00	0.000	0.003	0.2771	0.2017	0.0000	2.00E-07
110		0.35	0.161	0.058	0.2904	0.2016	0.0000	2.00E-07
111		1.19	0.850	0.220	0.3019	0.2016	0.0000	2.00E-07
112		0.17	0.022	0.071	0.3100	0.2015	0.0000	2.00E-07
113		0.00	0.000	0.155	0.2944	0.2015	0.0000	2.00E-07
114		0.00	0.000	0.106	0.2839	0.2014	0.0000	2.00E-07
115		0.00	0.000	0.053	0.2786	0.2014	0.0000	1.99E-07
116		0.00	0.000	0.013	0.2773	0.2013	0.0000	1.99E-07
117		0.00	0.000	0.003	0.2770	0.2012	0.0000	1.99E-07
118		0.00	0.000	0.000	0.2770	0.2012	0.0000	1.99E-07
119		0.00	0.000	0.000	0.2770	0.2011	0.0000	1.99E-07
120		0.00	0.000	0.000	0.2770	0.2011	0.0000	1.99E-07

121	0.00	0.000	0.002	0.2770	0.2010	0.0000	1.99E-07
122	0.03	0.000	0.020	0.2780	0.2010	0.0000	1.99E-07
123	0.19	0.034	0.036	0.2896	0.2009	0.0000	1.99E-07
124	0.00	0.000	0.010	0.2886	0.2008	0.0000	1.99E-07
125	0.63	0.441	0.048	0.3031	0.2008	0.0000	1.99E-07
126	0.09	0.000	0.040	0.3083	0.2007	0.0000	1.99E-07
127	0.00	0.000	0.014	0.3070	0.2007	0.0000	1.99E-07
128	0.00	0.000	0.013	0.3057	0.2006	0.0000	1.99E-07
129	0.00	0.000	0.013	0.3044	0.2005	0.0000	1.99E-07
130	1.11	0.926	0.044	0.3181	0.2005	0.0000	1.99E-07
131	2.25	1.922	0.208	0.3296	0.2004	0.0000	1.99E-07
132	0.09	0.003	0.141	0.3244	0.2004	0.0000	1.99E-07
133	0.00	0.000	0.158	0.3086	0.2003	0.0000	1.99E-07
134	0.00	0.000	0.127	0.2960	0.2002	0.0000	1.98E-07
135	0.25	0.077	0.193	0.2943	0.2002	0.0000	1.98E-07
136	0.00	0.000	0.128	0.2815	0.2001	0.0000	1.98E-07
137	0.00	0.000	0.032	0.2784	0.2001	0.0000	1.98E-07
138	0.00	0.000	0.011	0.2773	0.2000	0.0000	1.98E-07
139	0.00	0.000	0.003	0.2771	0.2000	0.0000	1.98E-07
140	0.00	0.000	0.000	0.2770	0.1999	0.0000	1.98E-07
141	0.00	0.000	0.000	0.2770	0.1998	0.0000	1.98E-07
142	0.45	0.247	0.056	0.2915	0.1998	0.0000	1.98E-07
143	0.57	0.405	0.053	0.3031	0.1997	0.0000	1.98E-07
144	0.68	0.386	0.186	0.3143	0.1997	0.0000	1.98E-07
145	0.00	0.000	0.093	0.3051	0.1996	0.0000	1.98E-07
146	0.27	0.101	0.110	0.3106	0.1995	0.0000	1.98E-07
147	0.24	0.086	0.155	0.3106	0.1995	0.0000	1.98E-07
148	0.04	0.000	0.137	0.3013	0.1994	0.0000	1.98E-07
149	0.00	0.000	0.106	0.2906	0.1994	0.0000	1.98E-07
150	0.00	0.000	0.105	0.2802	0.1993	0.0000	1.98E-07
151	0.00	0.000	0.025	0.2777	0.1993	0.0000	1.98E-07
152	0.00	0.000	0.005	0.2772	0.1992	0.0000	1.98E-07

153	0.00	0.000	0.001	0.2770	0.1991	0.0000	1.97E-07
154	0.04	0.000	0.024	0.2783	0.1991	0.0000	1.97E-07
155	0.15	0.000	0.038	0.2890	0.1990	0.0000	1.97E-07
156	0.00	0.000	0.015	0.2875	0.1990	0.0000	1.97E-07
157	0.59	0.391	0.056	0.3014	0.1989	0.0000	1.97E-07
158	0.70	0.376	0.260	0.3076	0.1989	0.0000	1.97E-07
159	0.01	0.000	0.060	0.3022	0.1988	0.0000	1.97E-07
160	0.06	0.000	0.089	0.2998	0.1987	0.0000	1.97E-07
161	0.01	0.000	0.200	0.2813	0.1987	0.0000	1.97E-07
162	0.93	0.648	0.121	0.2976	0.1986	0.0000	1.97E-07
163	1.73	1.308	0.308	0.3087	0.1986	0.0000	1.97E-07
164	0.54	0.277	0.276	0.3076	0.1985	0.0000	1.97E-07
165	0.37	0.171	0.108	0.3172	0.1984	0.0000	1.97E-07
166	0.02	0.000	0.062	0.3129	0.1984	0.0000	1.97E-07
167	0.04	0.000	0.068	0.3098	0.1983	0.0000	1.97E-07
168	0.01	0.000	0.057	0.3047	0.1983	0.0000	1.97E-07
169	0.00	0.000	0.131	0.2916	0.1982	0.0000	1.97E-07
170	0.00	0.000	0.127	0.2788	0.1982	0.0000	1.97E-07
171	0.00	0.000	0.014	0.2774	0.1981	0.0000	1.97E-07
172	0.06	0.000	0.037	0.2801	0.1980	0.0000	1.96E-07
173	0.00	0.000	0.006	0.2795	0.1980	0.0000	1.96E-07
174	0.00	0.000	0.011	0.2784	0.1979	0.0000	1.96E-07
175	0.00	0.000	0.007	0.2777	0.1979	0.0000	1.96E-07
176	0.33	0.138	0.061	0.2905	0.1978	0.0000	1.96E-07
177	0.12	0.000	0.040	0.2986	0.1977	0.0000	1.96E-07
178	0.00	0.000	0.013	0.2973	0.1977	0.0000	1.96E-07
179	0.00	0.000	0.020	0.2953	0.1976	0.0000	1.96E-07
180	0.00	0.000	0.020	0.2933	0.1976	0.0000	1.96E-07
181	0.00	0.000	0.020	0.2912	0.1975	0.0000	1.96E-07
182	0.02	0.000	0.036	0.2900	0.1975	0.0000	1.96E-07
183	1.11	0.920	0.049	0.3036	0.1974	0.0000	1.96E-07
184	1.25	1.023	0.109	0.3150	0.1973	0.0000	1.96E-07

185	0.01	0.000	0.080	0.3082	0.1973	0.0000	1.96E-07
186	0.00	0.000	0.064	0.3019	0.1972	0.0000	1.96E-07
187	0.00	0.000	0.071	0.2948	0.1972	0.0000	1.96E-07
188	0.00	0.000	0.155	0.2794	0.1971	0.0000	1.96E-07
189	0.00	0.000	0.020	0.2773	0.1971	0.0000	1.96E-07
190	0.00	0.000	0.002	0.2771	0.1970	0.0000	1.96E-07
191	0.00	0.000	0.001	0.2770	0.1969	0.0000	1.95E-07
192	0.00	0.000	0.000	0.2770	0.1969	0.0000	1.95E-07
193	0.01	0.000	0.009	0.2770	0.1968	0.0000	1.95E-07
194	0.14	0.000	0.030	0.2876	0.1968	0.0000	1.95E-07
195	0.00	0.000	0.014	0.2862	0.1967	0.0000	1.95E-07
196	0.78	0.590	0.054	0.3000	0.1967	0.0000	1.95E-07
197	0.00	0.000	0.073	0.2927	0.1966	0.0000	1.95E-07
198	0.00	0.000	0.019	0.2908	0.1965	0.0000	1.95E-07
199	0.00	0.000	0.022	0.2885	0.1965	0.0000	1.95E-07
200	0.03	0.000	0.036	0.2882	0.1964	0.0000	1.95E-07
201	0.00	0.000	0.022	0.2860	0.1964	0.0000	1.95E-07
202	0.00	0.000	0.019	0.2841	0.1963	0.0000	1.95E-07
203	0.43	0.236	0.048	0.2988	0.1963	0.0000	1.95E-07
204	0.00	0.000	0.078	0.2910	0.1962	0.0000	1.95E-07
205	0.00	0.000	0.105	0.2805	0.1961	0.0000	1.95E-07
206	0.00	0.000	0.031	0.2774	0.1961	0.0000	1.95E-07
207	0.00	0.000	0.003	0.2771	0.1960	0.0000	1.95E-07
208	0.00	0.000	0.001	0.2770	0.1960	0.0000	1.95E-07
209	0.00	0.000	0.000	0.2770	0.1959	0.0000	1.95E-07
210	0.00	0.000	0.000	0.2770	0.1959	0.0000	1.94E-07
211	0.00	0.000	0.000	0.2770	0.1958	0.0000	1.94E-07
212	0.00	0.000	0.000	0.2770	0.1957	0.0000	1.94E-07
213	0.00	0.000	0.000	0.2770	0.1957	0.0000	1.94E-07
214	0.00	0.000	0.000	0.2770	0.1956	0.0000	1.94E-07
215	0.00	0.000	0.000	0.2770	0.1956	0.0000	1.94E-07
216	0.17	0.004	0.038	0.2896	0.1955	0.0000	1.94E-07

217	0.00	0.000	0.012	0.2884	0.1955	0.0000	1.94E-07
218	0.40	0.207	0.049	0.3026	0.1954	0.0000	1.94E-07
219	0.00	0.000	0.017	0.3009	0.1953	0.0000	1.94E-07
220	0.00	0.000	0.018	0.2992	0.1953	0.0000	1.94E-07
221	0.00	0.000	0.019	0.2973	0.1952	0.0000	1.94E-07
222	0.00	0.000	0.019	0.2955	0.1952	0.0000	1.94E-07
223	0.00	0.000	0.017	0.2938	0.1951	0.0000	1.94E-07
224	0.00	0.000	0.019	0.2918	0.1951	0.0000	1.94E-07
225	0.00	0.000	0.017	0.2901	0.1950	0.0000	1.94E-07
226	0.00	0.000	0.017	0.2884	0.1949	0.0000	1.94E-07
227	0.00	0.000	0.015	0.2868	0.1949	0.0000	1.94E-07
228	0.06	0.000	0.039	0.2893	0.1948	0.0000	1.94E-07
229	0.00	0.000	0.025	0.2868	0.1948	0.0000	1.93E-07
230	0.00	0.000	0.018	0.2850	0.1947	0.0000	1.93E-07
231	0.00	0.000	0.019	0.2831	0.1947	0.0000	1.93E-07
232	0.00	0.000	0.017	0.2814	0.1946	0.0000	1.93E-07
233	0.37	0.176	0.050	0.2954	0.1945	0.0000	1.93E-07
234	0.00	0.000	0.116	0.2837	0.1945	0.0000	1.93E-07
235	0.00	0.000	0.021	0.2816	0.1944	0.0000	1.93E-07
236	0.00	0.000	0.025	0.2791	0.1944	0.0000	1.93E-07
237	0.00	0.000	0.018	0.2773	0.1943	0.0000	1.93E-07
238	0.05	0.000	0.029	0.2798	0.1943	0.0000	1.93E-07
239	0.00	0.000	0.002	0.2796	0.1942	0.0000	1.93E-07
240	0.11	0.000	0.033	0.2868	0.1941	0.0000	1.93E-07
241	0.00	0.000	0.014	0.2854	0.1941	0.0000	1.93E-07
242	0.00	0.000	0.012	0.2842	0.1940	0.0000	1.93E-07
243	0.00	0.000	0.011	0.2831	0.1940	0.0000	1.93E-07
244	0.00	0.000	0.010	0.2821	0.1939	0.0000	1.93E-07
245	0.00	0.000	0.011	0.2809	0.1939	0.0000	1.93E-07
246	0.00	0.000	0.010	0.2800	0.1938	0.0000	1.93E-07
247	0.00	0.000	0.010	0.2790	0.1938	0.0000	1.93E-07
248	0.00	0.000	0.010	0.2780	0.1937	0.0000	1.93E-07

249		0.00	0.000	0.008	0.2772	0.1936	0.0000	1.92E-07
250		0.00	0.000	0.002	0.2770	0.1936	0.0000	1.92E-07
251		0.00	0.000	0.000	0.2770	0.1935	0.0000	1.92E-07
252		0.16	0.000	0.035	0.2895	0.1935	0.0000	1.92E-07
253		0.01	0.000	0.013	0.2889	0.1934	0.0000	1.92E-07
254		0.00	0.000	0.009	0.2881	0.1934	0.0000	1.92E-07
255		0.00	0.000	0.010	0.2871	0.1933	0.0000	1.92E-07
256		0.39	0.202	0.040	0.3014	0.1932	0.0000	1.92E-07
257		0.00	0.000	0.090	0.2924	0.1932	0.0000	1.92E-07
258		0.00	0.000	0.009	0.2915	0.1931	0.0000	1.92E-07
259		0.00	0.000	0.008	0.2907	0.1931	0.0000	1.92E-07
260		0.00	0.000	0.008	0.2899	0.1930	0.0000	1.92E-07
261		0.00	0.000	0.007	0.2892	0.1930	0.0000	1.92E-07
262		0.00	0.000	0.009	0.2883	0.1929	0.0000	1.92E-07
263		0.00	0.000	0.007	0.2876	0.1928	0.0000	1.92E-07
264		0.00	0.000	0.008	0.2868	0.1928	0.0000	1.92E-07
265		0.00	0.000	0.007	0.2861	0.1927	0.0000	1.92E-07
266		0.22	0.057	0.036	0.2985	0.1927	0.0000	1.92E-07
267		0.37	0.178	0.079	0.3101	0.1926	0.0000	1.92E-07
268		0.06	0.000	0.148	0.3012	0.1926	0.0000	1.91E-07
269		0.02	0.000	0.072	0.2956	0.1925	0.0000	1.91E-07
270		0.00	0.000	0.045	0.2911	0.1925	0.0000	1.91E-07
271		0.21	0.057	0.060	0.3008	0.1924	0.0000	1.91E-07
272		1.16	0.985	0.062	0.3124	0.1923	0.0000	1.91E-07
273	*	0.00	0.000	0.026	0.3098	0.1923	0.0000	1.91E-07
274		0.00	0.000	0.077	0.3021	0.1922	0.0000	1.91E-07
275		0.00	0.000	0.064	0.2957	0.1922	0.0000	1.91E-07
276		0.00	0.000	0.077	0.2881	0.1921	0.0000	1.91E-07
277		0.00	0.000	0.058	0.2823	0.1921	0.0000	1.91E-07
278		0.00	0.000	0.045	0.2778	0.1920	0.0000	1.91E-07
279		0.00	0.000	0.006	0.2772	0.1919	0.0000	1.91E-07
280		0.00	0.000	0.001	0.2771	0.1919	0.0000	1.91E-07

281		0.00	0.000	0.001	0.2770	0.1918	0.0000	1.91E-07
282		0.00	0.000	0.000	0.2770	0.1918	0.0000	1.91E-07
283		0.00	0.000	0.000	0.2770	0.1917	0.0000	1.91E-07
284		0.00	0.000	0.000	0.2770	0.1917	0.0000	1.91E-07
285		0.00	0.000	0.000	0.2770	0.1916	0.0000	1.91E-07
286		0.00	0.000	0.000	0.2770	0.1916	0.0000	1.91E-07
287		0.00	0.000	0.000	0.2770	0.1915	0.0000	1.91E-07
288		0.00	0.000	0.000	0.2770	0.1914	0.0000	1.90E-07
289		0.24	0.074	0.038	0.2896	0.1914	0.0000	1.90E-07
290		0.01	0.000	0.017	0.2889	0.1913	0.0000	1.90E-07
291		0.16	0.013	0.041	0.2998	0.1913	0.0000	1.90E-07
292		0.00	0.000	0.009	0.2988	0.1912	0.0000	1.90E-07
293		0.14	0.001	0.041	0.3089	0.1912	0.0000	1.90E-07
294		0.11	0.001	0.087	0.3110	0.1911	0.0000	1.90E-07
295		0.01	0.000	0.059	0.3058	0.1911	0.0000	1.90E-07
296		0.00	0.000	0.085	0.2973	0.1910	0.0000	1.90E-07
297		0.00	0.000	0.044	0.2929	0.1909	0.0000	1.90E-07
298		0.00	0.000	0.036	0.2893	0.1909	0.0000	1.90E-07
299	*	0.00	0.000	0.029	0.2864	0.1908	0.0000	1.90E-07
300		0.00	0.000	0.021	0.2844	0.1908	0.0000	1.90E-07
301		0.00	0.000	0.023	0.2821	0.1907	0.0000	1.90E-07
302	*	0.00	0.000	0.000	0.2821	0.1907	0.0000	1.90E-07
303	*	0.00	0.000	0.000	0.2821	0.1906	0.0000	1.90E-07
304	*	0.00	0.000	0.000	0.2821	0.1906	0.0000	1.90E-07
305		0.00	0.000	0.023	0.2798	0.1905	0.0000	1.90E-07
306		0.39	0.201	0.053	0.2937	0.1904	0.0000	1.90E-07
307		0.00	0.000	0.020	0.2917	0.1904	0.0000	1.90E-07
308		0.08	0.000	0.047	0.2952	0.1903	0.0000	1.89E-07
309		0.32	0.150	0.049	0.3076	0.1903	0.0000	1.89E-07
310	*	0.03	0.000	0.056	0.3049	0.1902	0.0000	1.89E-07
311		0.00	0.000	0.031	0.3017	0.1902	0.0000	1.89E-07
312	*	0.01	0.000	0.013	0.3017	0.1901	0.0000	1.89E-07

313	*	0.00	0.000	0.014	0.3004	0.1900	0.0000	1.89E-07
314	*	0.00	0.000	0.014	0.2990	0.1900	0.0000	1.89E-07
315	*	0.00	0.000	0.000	0.2990	0.1899	0.0000	1.89E-07
316		0.00	0.000	0.026	0.2966	0.1899	0.0000	1.89E-07
317		0.06	0.000	0.085	0.2942	0.1898	0.0000	1.89E-07
318		0.00	0.000	0.028	0.2914	0.1898	0.0000	1.89E-07
319		0.01	0.000	0.041	0.2880	0.1897	0.0000	1.89E-07
320		1.60	1.391	0.064	0.3026	0.1897	0.0000	1.89E-07
321		0.00	0.000	0.056	0.2970	0.1896	0.0000	1.89E-07
322		0.00	0.000	0.032	0.2938	0.1895	0.0000	1.89E-07
323		0.00	0.000	0.035	0.2903	0.1895	0.0000	1.89E-07
324		0.00	0.000	0.032	0.2872	0.1894	0.0000	1.89E-07
325		0.00	0.000	0.036	0.2835	0.1894	0.0000	1.89E-07
326		0.00	0.000	0.057	0.2779	0.1893	0.0000	1.89E-07
327		0.00	0.000	0.007	0.2771	0.1893	0.0000	1.89E-07
328		0.00	0.000	0.001	0.2770	0.1892	0.0000	1.88E-07
329		0.05	0.000	0.030	0.2794	0.1892	0.0000	1.88E-07
330		0.11	0.000	0.032	0.2870	0.1891	0.0000	1.88E-07
331		0.00	0.000	0.017	0.2853	0.1891	0.0000	1.88E-07
332		0.00	0.000	0.020	0.2833	0.1890	0.0000	1.88E-07
333		0.00	0.000	0.016	0.2817	0.1889	0.0000	1.88E-07
334		0.00	0.000	0.019	0.2799	0.1889	0.0000	1.88E-07
335		0.00	0.000	0.017	0.2781	0.1888	0.0000	1.88E-07
336		0.31	0.133	0.052	0.2907	0.1888	0.0000	1.88E-07
337		0.00	0.000	0.031	0.2875	0.1887	0.0000	1.88E-07
338		0.00	0.000	0.016	0.2859	0.1887	0.0000	1.88E-07
339		0.00	0.000	0.015	0.2845	0.1886	0.0000	1.88E-07
340	*	0.00	0.000	0.014	0.2831	0.1886	0.0000	1.88E-07
341		0.00	0.000	0.013	0.2818	0.1885	0.0000	1.88E-07
342		0.00	0.000	0.012	0.2806	0.1884	0.0000	1.88E-07
343		0.00	0.000	0.012	0.2794	0.1884	0.0000	1.88E-07
344		0.00	0.000	0.009	0.2785	0.1883	0.0000	1.88E-07

345	0.00	0.000	0.012	0.2773	0.1883	0.0000	1.88E-07
346	0.00	0.000	0.002	0.2770	0.1882	0.0000	1.88E-07
347	0.00	0.000	0.000	0.2770	0.1882	0.0000	1.88E-07
348	0.88	0.670	0.043	0.2933	0.1881	0.0000	1.87E-07
349	0.03	0.000	0.036	0.2926	0.1881	0.0000	1.87E-07
350	0.00	0.000	0.032	0.2894	0.1881	0.0000	1.87E-07
351	0.09	0.000	0.063	0.2926	0.1880	0.0000	1.87E-07
352	0.04	0.000	0.055	0.2908	0.1880	0.0000	1.87E-07
353	0.00	0.000	0.037	0.2870	0.1879	0.0000	1.87E-07
354	0.00	0.000	0.038	0.2832	0.1879	0.0000	1.87E-07
355	0.00	0.000	0.044	0.2788	0.1878	0.0000	1.87E-07
356	0.00	0.000	0.014	0.2774	0.1878	0.0000	1.87E-07
357	0.00	0.000	0.003	0.2771	0.1877	0.0000	1.87E-07
358	0.00	0.000	0.000	0.2770	0.1876	0.0000	1.87E-07
359	0.00	0.000	0.000	0.2770	0.1876	0.0000	1.87E-07
360	0.00	0.000	0.000	0.2770	0.1875	0.0000	1.87E-07
361	0.00	0.000	0.000	0.2770	0.1875	0.0000	1.87E-07
362	0.00	0.000	0.000	0.2770	0.1874	0.0000	1.87E-07
363	0.00	0.000	0.000	0.2770	0.1874	0.0000	1.87E-07
364	0.00	0.000	0.000	0.2770	0.1873	0.0000	1.87E-07
365	0.00	0.000	0.000	0.2770	0.1873	0.0000	1.87E-07

* = Frozen (air or soil)

Annual Totals for Year 23			
	inches	cubic feet	percent
Precipitation	31.69	115,043.0	100.00
Runoff	18.763	68,108.4	59.20
Evapotranspiration	13.092	47,524.3	41.31
Recirculation into Layer 1	0.0082	29.7	0.03
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0082	29.7	0.03
Percolation/Leakage through Layer 5	0.000072	0.2596	0.00
Average Head on Top of Layer 4	0.1975	---	---
Change in Water Storage	-0.1625	-589.9	-0.51
Soil Water at Start of Year	1,406.6875	5,106,275.6	4438.58
Soil Water at End of Year	1,406.5250	5,105,685.7	4438.07
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0082	-29.7	-0.03

Daily Output for Year 24

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.000	0.2770	0.1872	0.0000	1.87E-07
2			0.00	0.000	0.000	0.2770	0.1872	0.0000	1.87E-07
3			0.00	0.000	0.000	0.2770	0.1871	0.0000	1.87E-07
4	*		0.00	0.000	0.000	0.2770	0.1871	0.0000	1.86E-07
5	*		0.51	0.000	0.035	0.2790	0.1870	0.0000	1.86E-07
6	*		0.00	0.000	0.034	0.2809	0.1869	0.0000	1.86E-07
7			0.00	0.237	0.040	0.2936	0.1869	0.0000	1.86E-07
8			0.12	0.000	0.035	0.3023	0.1868	0.0000	1.86E-07
9			0.48	0.309	0.044	0.3151	0.1868	0.0000	1.86E-07
10			0.00	0.000	0.027	0.3124	0.1867	0.0000	1.86E-07
11			0.00	0.000	0.022	0.3102	0.1867	0.0000	1.86E-07
12			0.00	0.000	0.051	0.3051	0.1866	0.0000	1.86E-07
13			0.00	0.000	0.028	0.3024	0.1866	0.0000	1.86E-07
14	*		0.01	0.000	0.008	0.3024	0.1865	0.0000	1.86E-07
15			0.00	0.000	0.028	0.2995	0.1865	0.0000	1.86E-07
16			0.00	0.000	0.040	0.2956	0.1864	0.0000	1.86E-07
17			0.00	0.000	0.044	0.2911	0.1863	0.0000	1.86E-07
18	*		0.00	0.000	0.025	0.2886	0.1863	0.0000	1.86E-07
19	*		0.11	0.000	0.049	0.2906	0.1862	0.0000	1.86E-07
20	*		0.19	0.000	0.015	0.2926	0.1862	0.0000	1.86E-07
21	*		0.10	0.000	0.008	0.2946	0.1861	0.0000	1.86E-07
22			0.00	0.000	0.042	0.2965	0.1861	0.0000	1.86E-07
23	*		0.08	0.000	0.021	0.2985	0.1860	0.0000	1.86E-07
24	*		0.33	0.000	0.012	0.3005	0.1860	0.0000	1.85E-07

25	*		0.42	0.000	0.008	0.3025	0.1859	0.0000	1.85E-07
26	*		0.09	0.000	0.005	0.3044	0.1859	0.0000	1.85E-07
27	*		0.00	0.000	0.000	0.3064	0.1858	0.0000	1.85E-07
28			0.00	0.746	0.000	0.3191	0.1857	0.0000	1.85E-07
29			0.00	0.000	0.077	0.3233	0.1857	0.0000	1.85E-07
30	*		0.00	0.000	0.000	0.3233	0.1856	0.0000	1.85E-07
31			0.00	0.000	0.032	0.3201	0.1856	0.0000	1.85E-07
32			0.00	0.000	0.071	0.3130	0.1855	0.0000	1.85E-07
33			0.00	0.000	0.032	0.3098	0.1855	0.0000	1.85E-07
34	*		0.21	0.000	0.051	0.3117	0.1854	0.0000	1.85E-07
35	*	*	0.00	0.000	0.022	0.3117	0.1854	0.0000	1.85E-07
36	*	*	0.00	0.000	0.011	0.3117	0.1853	0.0000	1.85E-07
37	*	*	0.00	0.000	0.007	0.3117	0.1853	0.0000	1.85E-07
38	*	*	0.00	0.000	0.032	0.3117	0.1852	0.0000	1.85E-07
39	*	*	0.00	0.000	0.037	0.3117	0.1852	0.0000	1.85E-07
40	*	*	0.01	0.000	0.042	0.3117	0.1851	0.0000	1.85E-07
41	*	*	0.09	0.000	0.015	0.3117	0.1850	0.0000	1.85E-07
42	*	*	0.00	0.000	0.034	0.3117	0.1850	0.0000	1.85E-07
43		*	0.00	0.000	0.039	0.3117	0.1849	0.0000	1.85E-07
44		*	0.00	0.000	0.000	0.3117	0.1849	0.0000	1.85E-07
45			0.02	0.000	0.056	0.3077	0.1848	0.0000	1.84E-07
46			0.11	0.000	0.068	0.3116	0.1848	0.0000	1.84E-07
47			0.00	0.000	0.044	0.3077	0.1847	0.0000	1.84E-07
48			0.05	0.000	0.084	0.3042	0.1847	0.0000	1.84E-07
49			0.00	0.000	0.034	0.3008	0.1846	0.0000	1.84E-07
50			0.00	0.000	0.029	0.2979	0.1846	0.0000	1.84E-07
51			0.00	0.000	0.081	0.2898	0.1845	0.0000	1.84E-07
52			1.11	0.859	0.090	0.3055	0.1844	0.0000	1.84E-07
53			0.22	0.068	0.096	0.3109	0.1844	0.0000	1.84E-07
54			0.03	0.000	0.087	0.3049	0.1844	0.0000	1.84E-07
55			0.00	0.000	0.072	0.2977	0.1846	0.0000	1.84E-07
56			0.00	0.000	0.039	0.2938	0.1845	0.0000	1.84E-07

57		0.00	0.000	0.058	0.2879	0.1845	0.0000	1.84E-07
58		0.00	0.000	0.050	0.2829	0.1844	0.0000	1.84E-07
59	*	0.00	0.000	0.000	0.2829	0.1844	0.0000	1.84E-07
60	*	0.62	0.000	0.023	0.2849	0.1843	0.0000	1.84E-07
61	*	0.62	0.000	0.036	0.2869	0.1843	0.0000	1.84E-07
62	*	0.00	0.000	0.021	0.2888	0.1842	0.0000	1.84E-07
63	*	0.03	0.000	0.012	0.2908	0.1841	0.0000	1.84E-07
64		0.04	0.283	0.000	0.3036	0.1841	0.0000	1.84E-07
65		0.00	0.402	0.000	0.3152	0.1840	0.0000	1.84E-07
66		0.65	0.758	0.002	0.3268	0.1840	0.0000	1.84E-07
67		0.08	0.000	0.107	0.3239	0.1839	0.0000	1.84E-07
68		0.13	0.005	0.091	0.3274	0.1839	0.0000	1.84E-07
69		0.16	0.016	0.094	0.3322	0.1838	0.0000	1.84E-07
70		0.01	0.000	0.073	0.3255	0.1838	0.0000	1.84E-07
71		0.01	0.000	0.055	0.3208	0.1837	0.0000	1.83E-07
72		0.01	0.000	0.143	0.3072	0.1837	0.0000	1.83E-07
73		0.00	0.000	0.127	0.2945	0.1836	0.0000	1.83E-07
74		0.26	0.090	0.084	0.3028	0.1836	0.0000	1.83E-07
75		0.00	0.000	0.072	0.2957	0.1835	0.0000	1.83E-07
76	*	0.00	0.000	0.000	0.2957	0.1834	0.0000	1.83E-07
77	*	0.00	0.000	0.000	0.2957	0.1834	0.0000	1.83E-07
78		0.00	0.000	0.047	0.2910	0.1833	0.0000	1.83E-07
79		0.00	0.000	0.084	0.2826	0.1833	0.0000	1.83E-07
80		0.00	0.000	0.050	0.2776	0.1832	0.0000	1.83E-07
81		0.00	0.000	0.005	0.2771	0.1832	0.0000	1.83E-07
82		0.21	0.042	0.047	0.2890	0.1831	0.0000	1.83E-07
83		0.10	0.000	0.044	0.2944	0.1831	0.0000	1.83E-07
84		0.76	0.568	0.063	0.3077	0.1830	0.0000	1.83E-07
85		0.27	0.113	0.144	0.3093	0.1830	0.0000	1.83E-07
86		0.00	0.000	0.081	0.3016	0.1829	0.0000	1.83E-07
87		0.25	0.083	0.114	0.3066	0.1829	0.0000	1.83E-07
88		2.12	1.868	0.136	0.3182	0.1828	0.0000	1.83E-07

89		0.32	0.145	0.143	0.3210	0.1827	0.0000	1.83E-07
90		0.00	0.000	0.095	0.3115	0.1827	0.0000	1.83E-07
91		0.01	0.000	0.040	0.3083	0.1826	0.0000	1.82E-07
92	*	0.00	0.000	0.002	0.3083	0.1826	0.0000	1.82E-07
93	*	0.01	0.000	0.007	0.3083	0.1825	0.0000	1.82E-07
94	*	0.05	0.000	0.041	0.3096	0.1825	0.0000	1.82E-07
95	*	0.00	0.000	0.000	0.3096	0.1824	0.0000	1.82E-07
96	*	0.37	0.000	0.014	0.3115	0.1824	0.0000	1.82E-07
97		0.62	0.826	0.000	0.3243	0.1823	0.0000	1.82E-07
98	*	0.00	0.000	0.000	0.3243	0.1823	0.0000	1.82E-07
99	*	0.01	0.000	0.036	0.3216	0.1822	0.0000	1.82E-07
100	*	0.05	0.000	0.099	0.3162	0.1822	0.0000	1.82E-07
101		0.01	0.000	0.058	0.3116	0.1821	0.0000	1.82E-07
102		0.00	0.000	0.079	0.3037	0.1821	0.0000	1.82E-07
103		0.00	0.000	0.087	0.2950	0.1820	0.0000	1.82E-07
104		0.00	0.000	0.145	0.2805	0.1820	0.0000	1.82E-07
105		0.00	0.000	0.031	0.2776	0.1819	0.0000	1.82E-07
106		1.10	0.845	0.091	0.2939	0.1819	0.0000	1.82E-07
107		0.04	0.000	0.101	0.2882	0.1818	0.0000	1.82E-07
108		0.00	0.000	0.099	0.2783	0.1818	0.0000	1.82E-07
109		0.34	0.134	0.124	0.2863	0.1817	0.0000	1.82E-07
110		0.21	0.047	0.113	0.2912	0.1817	0.0000	1.82E-07
111		0.22	0.058	0.135	0.2942	0.1816	0.0000	1.82E-07
112		0.32	0.116	0.116	0.3026	0.1815	0.0000	1.81E-07
113		0.00	0.000	0.103	0.2923	0.1815	0.0000	1.81E-07
114		0.00	0.000	0.078	0.2845	0.1814	0.0000	1.81E-07
115		0.76	0.512	0.084	0.3007	0.1814	0.0000	1.81E-07
116		0.00	0.000	0.055	0.2951	0.1813	0.0000	1.81E-07
117		0.91	0.635	0.123	0.3100	0.1813	0.0000	1.81E-07
118		0.00	0.000	0.177	0.2924	0.1812	0.0000	1.81E-07
119		0.38	0.126	0.256	0.2921	0.1812	0.0000	1.81E-07
120		0.00	0.000	0.106	0.2815	0.1811	0.0000	1.81E-07

121	0.16	0.000	0.089	0.2887	0.1811	0.0000	1.81E-07
122	0.06	0.000	0.088	0.2855	0.1810	0.0000	1.81E-07
123	0.01	0.000	0.048	0.2819	0.1810	0.0000	1.81E-07
124	0.00	0.000	0.024	0.2795	0.1809	0.0000	1.81E-07
125	0.02	0.000	0.025	0.2789	0.1809	0.0000	1.81E-07
126	0.00	0.000	0.004	0.2785	0.1808	0.0000	1.81E-07
127	0.01	0.000	0.012	0.2780	0.1807	0.0000	1.81E-07
128	0.00	0.000	0.004	0.2777	0.1807	0.0000	1.81E-07
129	1.12	0.910	0.053	0.2934	0.1806	0.0000	1.81E-07
130	0.58	0.247	0.222	0.3044	0.1806	0.0000	1.81E-07
131	0.60	0.331	0.177	0.3138	0.1805	0.0000	1.81E-07
132	0.75	0.448	0.251	0.3187	0.1805	0.0000	1.81E-07
133	0.02	0.000	0.064	0.3148	0.1804	0.0000	1.80E-07
134	0.00	0.000	0.105	0.3043	0.1804	0.0000	1.80E-07
135	0.56	0.259	0.214	0.3134	0.1803	0.0000	1.80E-07
136	0.00	0.000	0.151	0.2982	0.1803	0.0000	1.80E-07
137	0.00	0.000	0.060	0.2922	0.1802	0.0000	1.80E-07
138	1.09	0.689	0.253	0.3068	0.1802	0.0000	1.80E-07
139	0.34	0.111	0.287	0.3009	0.1801	0.0000	1.80E-07
140	0.11	0.000	0.145	0.2974	0.1801	0.0000	1.80E-07
141	0.03	0.000	0.129	0.2875	0.1800	0.0000	1.80E-07
142	0.44	0.155	0.270	0.2889	0.1800	0.0000	1.80E-07
143	0.00	0.000	0.083	0.2806	0.1804	0.0000	1.80E-07
144	0.01	0.000	0.039	0.2776	0.1812	0.0000	1.81E-07
145	1.16	0.734	0.285	0.2913	0.1812	0.0000	1.81E-07
146	0.12	0.000	0.062	0.2975	0.1811	0.0000	1.81E-07
147	0.00	0.000	0.104	0.2872	0.1810	0.0000	1.81E-07
148	0.18	0.001	0.166	0.2883	0.1810	0.0000	1.81E-07
149	0.13	0.000	0.098	0.2910	0.1809	0.0000	1.81E-07
150	0.00	0.000	0.029	0.2882	0.1809	0.0000	1.81E-07
151	0.00	0.000	0.030	0.2852	0.1808	0.0000	1.81E-07
152	0.14	0.000	0.056	0.2937	0.1808	0.0000	1.81E-07

153	0.00	0.000	0.019	0.2918	0.1807	0.0000	1.81E-07
154	0.00	0.000	0.022	0.2896	0.1807	0.0000	1.81E-07
155	0.00	0.000	0.020	0.2876	0.1806	0.0000	1.81E-07
156	0.74	0.543	0.056	0.3020	0.1806	0.0000	1.81E-07
157	0.04	0.000	0.098	0.2958	0.1805	0.0000	1.81E-07
158	0.37	0.130	0.194	0.3006	0.1805	0.0000	1.80E-07
159	0.00	0.000	0.074	0.2932	0.1804	0.0000	1.80E-07
160	0.00	0.000	0.085	0.2847	0.1804	0.0000	1.80E-07
161	0.00	0.000	0.043	0.2805	0.1803	0.0000	1.80E-07
162	0.00	0.000	0.030	0.2775	0.1803	0.0000	1.80E-07
163	0.00	0.000	0.004	0.2771	0.1802	0.0000	1.80E-07
164	0.00	0.000	0.001	0.2770	0.1801	0.0000	1.80E-07
165	0.00	0.000	0.000	0.2770	0.1801	0.0000	1.80E-07
166	0.00	0.000	0.000	0.2770	0.1800	0.0000	1.80E-07
167	0.00	0.000	0.000	0.2770	0.1800	0.0000	1.80E-07
168	0.00	0.000	0.000	0.2770	0.1799	0.0000	1.80E-07
169	0.00	0.000	0.000	0.2770	0.1799	0.0000	1.80E-07
170	0.00	0.000	0.000	0.2770	0.1798	0.0000	1.80E-07
171	0.31	0.133	0.053	0.2895	0.1798	0.0000	1.80E-07
172	0.00	0.000	0.012	0.2882	0.1797	0.0000	1.80E-07
173	0.41	0.216	0.054	0.3022	0.1797	0.0000	1.80E-07
174	0.28	0.104	0.152	0.3049	0.1796	0.0000	1.80E-07
175	0.42	0.192	0.169	0.3106	0.1796	0.0000	1.80E-07
176	0.00	0.000	0.165	0.2943	0.1795	0.0000	1.80E-07
177	1.07	0.802	0.107	0.3106	0.1795	0.0000	1.80E-07
178	0.45	0.195	0.315	0.3049	0.1794	0.0000	1.80E-07
179	0.00	0.000	0.121	0.2928	0.1794	0.0000	1.79E-07
180	0.12	0.000	0.174	0.2875	0.1793	0.0000	1.79E-07
181	0.00	0.000	0.080	0.2795	0.1793	0.0000	1.79E-07
182	0.00	0.000	0.019	0.2776	0.1792	0.0000	1.79E-07
183	0.00	0.000	0.004	0.2771	0.1792	0.0000	1.79E-07
184	0.00	0.000	0.001	0.2770	0.1791	0.0000	1.79E-07

185	0.00	0.000	0.000	0.2770	0.1790	0.0000	1.79E-07
186	0.00	0.000	0.000	0.2770	0.1790	0.0000	1.79E-07
187	0.00	0.000	0.000	0.2770	0.1789	0.0000	1.79E-07
188	0.00	0.000	0.000	0.2770	0.1789	0.0000	1.79E-07
189	0.00	0.000	0.000	0.2770	0.1788	0.0000	1.79E-07
190	0.00	0.000	0.000	0.2770	0.1788	0.0000	1.79E-07
191	0.00	0.000	0.000	0.2770	0.1787	0.0000	1.79E-07
192	0.03	0.000	0.021	0.2776	0.1787	0.0000	1.79E-07
193	0.00	0.000	0.007	0.2773	0.1786	0.0000	1.79E-07
194	0.86	0.653	0.052	0.2933	0.1786	0.0000	1.79E-07
195	0.13	0.000	0.040	0.3024	0.1785	0.0000	1.79E-07
196	0.03	0.000	0.031	0.3021	0.1785	0.0000	1.79E-07
197	0.08	0.000	0.045	0.3061	0.1784	0.0000	1.79E-07
198	0.16	0.006	0.049	0.3168	0.1784	0.0000	1.79E-07
199	0.00	0.000	0.024	0.3144	0.1783	0.0000	1.79E-07
200	0.00	0.000	0.023	0.3121	0.1783	0.0000	1.78E-07
201	0.00	0.000	0.025	0.3096	0.1782	0.0000	1.78E-07
202	0.07	0.000	0.047	0.3116	0.1782	0.0000	1.78E-07
203	0.00	0.000	0.025	0.3091	0.1781	0.0000	1.78E-07
204	0.17	0.008	0.051	0.3202	0.1781	0.0000	1.78E-07
205	0.00	0.000	0.118	0.3084	0.1780	0.0000	1.78E-07
206	0.00	0.000	0.027	0.3057	0.1780	0.0000	1.78E-07
207	0.00	0.000	0.029	0.3029	0.1779	0.0000	1.78E-07
208	0.02	0.000	0.034	0.3017	0.1778	0.0000	1.78E-07
209	0.00	0.000	0.018	0.2999	0.1778	0.0000	1.78E-07
210	0.08	0.000	0.056	0.3019	0.1777	0.0000	1.78E-07
211	0.00	0.000	0.029	0.2990	0.1777	0.0000	1.78E-07
212	0.04	0.000	0.048	0.2981	0.1776	0.0000	1.78E-07
213	2.48	2.306	0.052	0.3100	0.1776	0.0000	1.78E-07
214	0.00	0.000	0.056	0.3044	0.1775	0.0000	1.78E-07
215	0.00	0.000	0.156	0.2888	0.1775	0.0000	1.78E-07
216	0.01	0.000	0.073	0.2827	0.1774	0.0000	1.78E-07

217	0.00	0.000	0.054	0.2773	0.1774	0.0000	1.78E-07
218	0.27	0.096	0.065	0.2879	0.1773	0.0000	1.78E-07
219	0.00	0.000	0.035	0.2846	0.1773	0.0000	1.78E-07
220	0.00	0.000	0.058	0.2789	0.1772	0.0000	1.78E-07
221	0.00	0.000	0.017	0.2772	0.1772	0.0000	1.77E-07
222	0.00	0.000	0.002	0.2771	0.1771	0.0000	1.77E-07
223	0.07	0.000	0.033	0.2805	0.1771	0.0000	1.77E-07
224	0.13	0.000	0.043	0.2890	0.1770	0.0000	1.77E-07
225	0.00	0.000	0.022	0.2868	0.1770	0.0000	1.77E-07
226	0.00	0.000	0.028	0.2840	0.1769	0.0000	1.77E-07
227	0.00	0.000	0.026	0.2813	0.1769	0.0000	1.77E-07
228	0.00	0.000	0.025	0.2789	0.1768	0.0000	1.77E-07
229	0.00	0.000	0.014	0.2774	0.1768	0.0000	1.77E-07
230	0.00	0.000	0.003	0.2771	0.1767	0.0000	1.77E-07
231	0.13	0.000	0.034	0.2867	0.1767	0.0000	1.77E-07
232	0.00	0.000	0.012	0.2854	0.1766	0.0000	1.77E-07
233	0.00	0.000	0.019	0.2835	0.1766	0.0000	1.77E-07
234	0.60	0.401	0.061	0.2972	0.1765	0.0000	1.77E-07
235	0.00	0.000	0.097	0.2874	0.1764	0.0000	1.77E-07
236	0.00	0.000	0.025	0.2850	0.1764	0.0000	1.77E-07
237	0.00	0.000	0.019	0.2831	0.1763	0.0000	1.77E-07
238	0.17	0.003	0.049	0.2947	0.1763	0.0000	1.77E-07
239	0.07	0.000	0.053	0.2969	0.1762	0.0000	1.77E-07
240	0.00	0.000	0.025	0.2944	0.1762	0.0000	1.77E-07
241	0.17	0.012	0.049	0.3055	0.1761	0.0000	1.77E-07
242	0.27	0.115	0.061	0.3144	0.1761	0.0000	1.76E-07
243	0.02	0.000	0.080	0.3084	0.1760	0.0000	1.76E-07
244	0.00	0.000	0.087	0.2997	0.1760	0.0000	1.76E-07
245	0.00	0.000	0.151	0.2845	0.1759	0.0000	1.76E-07
246	0.00	0.000	0.063	0.2782	0.1759	0.0000	1.76E-07
247	0.00	0.000	0.010	0.2772	0.1758	0.0000	1.76E-07
248	0.00	0.000	0.002	0.2770	0.1758	0.0000	1.76E-07

249	0.00	0.000	0.000	0.2770	0.1757	0.0000	1.76E-07
250	0.00	0.000	0.000	0.2770	0.1757	0.0000	1.76E-07
251	0.00	0.000	0.000	0.2770	0.1756	0.0000	1.76E-07
252	0.10	0.000	0.034	0.2834	0.1756	0.0000	1.76E-07
253	0.32	0.133	0.063	0.2959	0.1755	0.0000	1.76E-07
254	0.00	0.000	0.017	0.2941	0.1755	0.0000	1.76E-07
255	0.00	0.000	0.031	0.2910	0.1754	0.0000	1.76E-07
256	0.00	0.000	0.028	0.2882	0.1754	0.0000	1.76E-07
257	0.00	0.000	0.033	0.2849	0.1753	0.0000	1.76E-07
258	0.00	0.000	0.020	0.2829	0.1753	0.0000	1.76E-07
259	0.00	0.000	0.022	0.2808	0.1752	0.0000	1.76E-07
260	0.00	0.000	0.014	0.2794	0.1752	0.0000	1.76E-07
261	0.35	0.166	0.063	0.2914	0.1751	0.0000	1.76E-07
262	0.46	0.293	0.056	0.3023	0.1751	0.0000	1.76E-07
263	0.14	0.003	0.138	0.3024	0.1750	0.0000	1.76E-07
264	0.00	0.000	0.115	0.2909	0.1750	0.0000	1.75E-07
265	0.00	0.000	0.086	0.2823	0.1749	0.0000	1.75E-07
266	0.00	0.000	0.044	0.2779	0.1749	0.0000	1.75E-07
267	0.00	0.000	0.010	0.2772	0.1748	0.0000	1.75E-07
268	0.01	0.000	0.011	0.2771	0.1748	0.0000	1.75E-07
269	0.11	0.000	0.035	0.2848	0.1747	0.0000	1.75E-07
270	0.10	0.000	0.045	0.2907	0.1747	0.0000	1.75E-07
271	0.00	0.000	0.015	0.2892	0.1746	0.0000	1.75E-07
272	0.05	0.000	0.042	0.2902	0.1746	0.0000	1.75E-07
273	0.00	0.000	0.015	0.2887	0.1745	0.0000	1.75E-07
274	0.00	0.000	0.014	0.2873	0.1745	0.0000	1.75E-07
275	0.00	0.000	0.016	0.2857	0.1744	0.0000	1.75E-07
276	0.00	0.000	0.015	0.2843	0.1744	0.0000	1.75E-07
277	0.00	0.000	0.015	0.2828	0.1743	0.0000	1.75E-07
278	0.00	0.000	0.013	0.2814	0.1743	0.0000	1.75E-07
279	0.00	0.000	0.012	0.2802	0.1742	0.0000	1.75E-07
280	0.00	0.000	0.012	0.2790	0.1742	0.0000	1.75E-07

281	0.00	0.000	0.011	0.2780	0.1741	0.0000	1.75E-07
282	0.00	0.000	0.007	0.2772	0.1741	0.0000	1.75E-07
283	0.00	0.000	0.002	0.2770	0.1740	0.0000	1.75E-07
284	0.00	0.000	0.000	0.2770	0.1740	0.0000	1.75E-07
285	0.19	0.022	0.038	0.2899	0.1739	0.0000	1.74E-07
286	0.35	0.186	0.046	0.3015	0.1739	0.0000	1.74E-07
287	0.00	0.000	0.006	0.3009	0.1738	0.0000	1.74E-07
288	0.00	0.000	0.009	0.3000	0.1738	0.0000	1.74E-07
289	0.00	0.000	0.009	0.2990	0.1737	0.0000	1.74E-07
290	0.00	0.000	0.009	0.2981	0.1737	0.0000	1.74E-07
291	0.00	0.000	0.009	0.2972	0.1736	0.0000	1.74E-07
292	0.00	0.000	0.008	0.2964	0.1736	0.0000	1.74E-07
293	0.00	0.000	0.008	0.2956	0.1735	0.0000	1.74E-07
294	0.00	0.000	0.008	0.2948	0.1735	0.0000	1.74E-07
295	0.00	0.000	0.008	0.2940	0.1734	0.0000	1.74E-07
296	0.00	0.000	0.008	0.2932	0.1734	0.0000	1.74E-07
297	0.00	0.000	0.008	0.2924	0.1733	0.0000	1.74E-07
298	1.00	0.807	0.043	0.3072	0.1733	0.0000	1.74E-07
299	0.00	0.000	0.075	0.2998	0.1732	0.0000	1.74E-07
300	0.00	0.000	0.043	0.2955	0.1732	0.0000	1.74E-07
301	0.00	0.000	0.047	0.2908	0.1731	0.0000	1.74E-07
302	0.45	0.240	0.057	0.3061	0.1731	0.0000	1.74E-07
303	0.00	0.000	0.038	0.3023	0.1730	0.0000	1.74E-07
304	0.00	0.000	0.068	0.2955	0.1729	0.0000	1.74E-07
305	0.00	0.000	0.037	0.2918	0.1729	0.0000	1.74E-07
306	0.00	0.000	0.044	0.2874	0.1728	0.0000	1.74E-07
307	0.00	0.000	0.023	0.2852	0.1728	0.0000	1.73E-07
308	0.02	0.000	0.055	0.2817	0.1727	0.0000	1.73E-07
309	0.00	0.000	0.035	0.2782	0.1727	0.0000	1.73E-07
310	0.00	0.000	0.011	0.2772	0.1726	0.0000	1.73E-07
311	0.00	0.000	0.002	0.2770	0.1726	0.0000	1.73E-07
312	0.00	0.000	0.000	0.2770	0.1725	0.0000	1.73E-07

313		0.00	0.000	0.000	0.2770	0.1725	0.0000	1.73E-07
314	*	0.06	0.000	0.041	0.2790	0.1724	0.0000	1.73E-07
315		0.00	0.000	0.003	0.2787	0.1724	0.0000	1.73E-07
316	*	0.00	0.000	0.000	0.2787	0.1723	0.0000	1.73E-07
317		0.00	0.000	0.006	0.2781	0.1723	0.0000	1.73E-07
318	*	0.01	0.000	0.019	0.2777	0.1722	0.0000	1.73E-07
319		0.00	0.000	0.008	0.2772	0.1722	0.0000	1.73E-07
320		0.61	0.396	0.056	0.2935	0.1721	0.0000	1.73E-07
321		0.00	0.000	0.019	0.2916	0.1721	0.0000	1.73E-07
322		0.00	0.000	0.020	0.2897	0.1720	0.0000	1.73E-07
323		0.00	0.000	0.024	0.2873	0.1720	0.0000	1.73E-07
324		0.10	0.000	0.062	0.2908	0.1719	0.0000	1.73E-07
325		0.00	0.000	0.027	0.2881	0.1719	0.0000	1.73E-07
326		0.00	0.000	0.025	0.2856	0.1718	0.0000	1.73E-07
327		0.00	0.000	0.017	0.2839	0.1718	0.0000	1.73E-07
328		0.01	0.000	0.036	0.2814	0.1717	0.0000	1.73E-07
329		0.23	0.070	0.054	0.2920	0.1717	0.0000	1.72E-07
330	*	0.00	0.000	0.015	0.2905	0.1716	0.0000	1.72E-07
331		0.00	0.000	0.022	0.2882	0.1716	0.0000	1.72E-07
332	*	0.00	0.000	0.000	0.2882	0.1715	0.0000	1.72E-07
333	*	0.00	0.000	0.000	0.2882	0.1715	0.0000	1.72E-07
334	*	0.35	0.000	0.026	0.2902	0.1714	0.0000	1.72E-07
335	*	0.63	0.000	0.027	0.2922	0.1714	0.0000	1.72E-07
336	*	0.00	0.000	0.000	0.2942	0.1713	0.0000	1.72E-07
337	*	0.00	0.000	0.040	0.2961	0.1713	0.0000	1.72E-07
338	*	0.00	0.000	0.037	0.2981	0.1712	0.0000	1.72E-07
339	*	0.05	0.000	0.035	0.3001	0.1712	0.0000	1.72E-07
340		0.00	0.032	0.029	0.3128	0.1711	0.0000	1.72E-07
341		0.00	0.411	0.026	0.3244	0.1711	0.0000	1.72E-07
342		0.00	0.000	0.022	0.3222	0.1710	0.0000	1.72E-07
343		0.00	0.000	0.037	0.3185	0.1710	0.0000	1.72E-07
344		0.00	0.000	0.031	0.3153	0.1709	0.0000	1.72E-07

345		0.00	0.000	0.025	0.3128	0.1709	0.0000	1.72E-07
346		0.03	0.000	0.043	0.3113	0.1708	0.0000	1.72E-07
347		0.23	0.062	0.059	0.3223	0.1708	0.0000	1.72E-07
348		0.00	0.000	0.046	0.3177	0.1707	0.0000	1.72E-07
349		0.00	0.000	0.029	0.3148	0.1707	0.0000	1.72E-07
350		0.00	0.000	0.044	0.3104	0.1706	0.0000	1.72E-07
351		0.00	0.000	0.046	0.3058	0.1706	0.0000	1.71E-07
352		0.00	0.000	0.021	0.3037	0.1705	0.0000	1.71E-07
353	*	0.29	0.000	0.026	0.3057	0.1705	0.0000	1.71E-07
354		0.00	0.059	0.055	0.3185	0.1704	0.0000	1.71E-07
355		0.11	0.000	0.061	0.3236	0.1704	0.0000	1.71E-07
356		0.00	0.000	0.050	0.3186	0.1703	0.0000	1.71E-07
357		0.00	0.000	0.022	0.3165	0.1703	0.0000	1.71E-07
358		0.00	0.000	0.034	0.3131	0.1702	0.0000	1.71E-07
359		0.00	0.000	0.036	0.3094	0.1702	0.0000	1.71E-07
360		0.00	0.000	0.045	0.3049	0.1701	0.0000	1.71E-07
361		0.00	0.000	0.075	0.2974	0.1701	0.0000	1.71E-07
362		0.00	0.000	0.038	0.2936	0.1700	0.0000	1.71E-07
363		0.00	0.000	0.019	0.2918	0.1700	0.0000	1.71E-07
364		0.00	0.000	0.033	0.2885	0.1699	0.0000	1.71E-07
365	*	0.00	0.000	0.021	0.2864	0.1699	0.0000	1.71E-07

* = Frozen (air or soil)

Annual Totals for Year 24			
	inches	cubic feet	percent
Precipitation	40.62	147,456.0	100.00
Runoff	22.573	81,940.8	55.57
Evapotranspiration	17.960	65,193.8	44.21
Recirculation into Layer 1	0.0074	26.9	0.02
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0074	26.9	0.02
Percolation/Leakage through Layer 5	0.000065	0.2376	0.00
Average Head on Top of Layer 4	0.1786	---	---
Change in Water Storage	0.0885	321.2	0.22
Soil Water at Start of Year	1,406.5250	5,105,685.7	3462.51
Soil Water at End of Year	1,406.6135	5,106,006.9	3462.73
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0074	-26.9	-0.02

Daily Output for Year 25

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.002	0.2864	0.1698	0.0000	1.71E-07
2	*		0.39	0.000	0.021	0.2884	0.1697	0.0000	1.71E-07
3	*		0.01	0.000	0.022	0.2904	0.1697	0.0000	1.71E-07
4	*		0.10	0.000	0.000	0.2923	0.1696	0.0000	1.71E-07
5	*		0.00	0.000	0.034	0.2943	0.1696	0.0000	1.71E-07
6			0.00	0.159	0.057	0.3070	0.1695	0.0000	1.70E-07
7			0.00	0.000	0.065	0.3006	0.1695	0.0000	1.70E-07
8			0.00	0.000	0.054	0.2952	0.1694	0.0000	1.70E-07
9			0.00	0.000	0.053	0.2898	0.1694	0.0000	1.70E-07
10			0.00	0.000	0.074	0.2824	0.1693	0.0000	1.70E-07
11			0.00	0.000	0.041	0.2783	0.1693	0.0000	1.70E-07
12			0.00	0.000	0.011	0.2773	0.1692	0.0000	1.70E-07
13			0.00	0.000	0.002	0.2770	0.1692	0.0000	1.70E-07
14			0.00	0.000	0.000	0.2770	0.1691	0.0000	1.70E-07
15			0.00	0.000	0.000	0.2770	0.1691	0.0000	1.70E-07
16			0.00	0.000	0.000	0.2770	0.1690	0.0000	1.70E-07
17			0.00	0.000	0.000	0.2770	0.1690	0.0000	1.70E-07
18	*		0.00	0.000	0.000	0.2770	0.1689	0.0000	1.70E-07
19			0.00	0.000	0.000	0.2770	0.1689	0.0000	1.70E-07
20	*		0.00	0.000	0.000	0.2770	0.1689	0.0000	1.70E-07
21	*		0.23	0.000	0.029	0.2790	0.1688	0.0000	1.70E-07
22	*		0.44	0.000	0.000	0.2809	0.1688	0.0000	1.70E-07
23			0.00	0.387	0.007	0.2936	0.1687	0.0000	1.70E-07
24			0.00	0.000	0.062	0.2950	0.1687	0.0000	1.70E-07

25		0.18	0.014	0.054	0.3062	0.1686	0.0000	1.70E-07
26		0.03	0.000	0.048	0.3040	0.1686	0.0000	1.70E-07
27		0.00	0.000	0.027	0.3012	0.1685	0.0000	1.70E-07
28		0.00	0.000	0.032	0.2981	0.1685	0.0000	1.70E-07
29		0.00	0.000	0.018	0.2962	0.1684	0.0000	1.69E-07
30		0.00	0.000	0.025	0.2937	0.1684	0.0000	1.69E-07
31	*	0.06	0.000	0.023	0.2957	0.1683	0.0000	1.69E-07
32		0.00	0.000	0.044	0.2933	0.1683	0.0000	1.69E-07
33		0.00	0.000	0.036	0.2897	0.1682	0.0000	1.69E-07
34		0.00	0.000	0.068	0.2829	0.1682	0.0000	1.69E-07
35		0.00	0.000	0.029	0.2800	0.1681	0.0000	1.69E-07
36		0.00	0.000	0.025	0.2775	0.1681	0.0000	1.69E-07
37		0.00	0.000	0.004	0.2771	0.1680	0.0000	1.69E-07
38		0.00	0.000	0.001	0.2770	0.1680	0.0000	1.69E-07
39		0.00	0.000	0.000	0.2770	0.1679	0.0000	1.69E-07
40		0.00	0.000	0.000	0.2770	0.1679	0.0000	1.69E-07
41		0.00	0.000	0.000	0.2770	0.1678	0.0000	1.69E-07
42		0.01	0.000	0.010	0.2770	0.1678	0.0000	1.69E-07
43		0.00	0.000	0.000	0.2770	0.1677	0.0000	1.69E-07
44		0.00	0.000	0.000	0.2770	0.1677	0.0000	1.69E-07
45		0.00	0.000	0.000	0.2770	0.1676	0.0000	1.69E-07
46		0.00	0.000	0.000	0.2770	0.1676	0.0000	1.69E-07
47		0.00	0.000	0.000	0.2770	0.1675	0.0000	1.69E-07
48		0.00	0.000	0.000	0.2770	0.1675	0.0000	1.69E-07
49		0.00	0.000	0.003	0.2770	0.1674	0.0000	1.69E-07
50		0.05	0.000	0.026	0.2792	0.1674	0.0000	1.69E-07
51	*	0.23	0.000	0.039	0.2812	0.1674	0.0000	1.68E-07
52	*	0.01	0.000	0.036	0.2831	0.1673	0.0000	1.68E-07
53	*	0.00	0.000	0.061	0.2851	0.1673	0.0000	1.68E-07
54		0.00	0.000	0.059	0.2844	0.1672	0.0000	1.68E-07
55		0.00	0.000	0.007	0.2838	0.1672	0.0000	1.68E-07
56		0.00	0.000	0.009	0.2829	0.1671	0.0000	1.68E-07

57	*		0.00	0.000	0.009	0.2819	0.1671	0.0000	1.68E-07
58	*		0.00	0.000	0.000	0.2819	0.1670	0.0000	1.68E-07
59			0.00	0.000	0.009	0.2810	0.1670	0.0000	1.68E-07
60			0.06	0.000	0.036	0.2835	0.1669	0.0000	1.68E-07
61			0.36	0.184	0.044	0.2966	0.1669	0.0000	1.68E-07
62	*		0.00	0.000	0.000	0.2966	0.1668	0.0000	1.68E-07
63	*		0.03	0.000	0.029	0.2966	0.1668	0.0000	1.68E-07
64	*		0.08	0.000	0.023	0.2986	0.1667	0.0000	1.68E-07
65			0.00	0.000	0.048	0.2976	0.1667	0.0000	1.68E-07
66	*		0.24	0.000	0.023	0.2996	0.1666	0.0000	1.68E-07
67			0.18	0.150	0.101	0.3123	0.1666	0.0000	1.68E-07
68	*		0.00	0.000	0.036	0.3087	0.1665	0.0000	1.68E-07
69	*		0.00	0.000	0.000	0.3087	0.1665	0.0000	1.68E-07
70	*		0.00	0.000	0.009	0.3078	0.1664	0.0000	1.68E-07
71	*		0.00	0.000	0.009	0.3070	0.1664	0.0000	1.68E-07
72	*		0.00	0.000	0.000	0.3070	0.1663	0.0000	1.68E-07
73	*		0.00	0.000	0.000	0.3070	0.1663	0.0000	1.68E-07
74			0.00	0.000	0.010	0.3060	0.1662	0.0000	1.67E-07
75			0.00	0.000	0.010	0.3050	0.1662	0.0000	1.67E-07
76			0.00	0.000	0.010	0.3040	0.1661	0.0000	1.67E-07
77			0.00	0.000	0.010	0.3030	0.1661	0.0000	1.67E-07
78			0.43	0.243	0.042	0.3172	0.1660	0.0000	1.67E-07
79			0.63	0.393	0.122	0.3288	0.1660	0.0000	1.67E-07
80			1.05	0.820	0.113	0.3405	0.1659	0.0000	1.67E-07
81			0.00	0.000	0.062	0.3342	0.1659	0.0000	1.67E-07
82			0.00	0.000	0.059	0.3283	0.1658	0.0000	1.67E-07
83			0.00	0.000	0.064	0.3219	0.1658	0.0000	1.67E-07
84	*		0.00	0.000	0.000	0.3219	0.1657	0.0000	1.67E-07
85	*	*	0.00	0.000	0.000	0.3219	0.1657	0.0000	1.67E-07
86		*	0.00	0.000	0.000	0.3219	0.1656	0.0000	1.67E-07
87		*	0.00	0.000	0.000	0.3219	0.1656	0.0000	1.67E-07
88			0.01	0.000	0.071	0.3154	0.1655	0.0000	1.67E-07

89		0.00	0.000	0.038	0.3115	0.1655	0.0000	1.67E-07
90	*	0.00	0.000	0.026	0.3089	0.1655	0.0000	1.67E-07
91		0.01	0.000	0.098	0.2998	0.1654	0.0000	1.67E-07
92		0.01	0.000	0.082	0.2923	0.1655	0.0000	1.67E-07
93		0.00	0.000	0.075	0.2848	0.1655	0.0000	1.67E-07
94		0.00	0.000	0.046	0.2802	0.1654	0.0000	1.67E-07
95	*	0.00	0.000	0.000	0.2802	0.1654	0.0000	1.67E-07
96		0.00	0.000	0.025	0.2777	0.1653	0.0000	1.67E-07
97		0.00	0.000	0.007	0.2770	0.1656	0.0000	1.67E-07
98		0.42	0.222	0.062	0.2912	0.1656	0.0000	1.67E-07
99		0.00	0.000	0.039	0.2873	0.1656	0.0000	1.67E-07
100		0.00	0.000	0.019	0.2853	0.1655	0.0000	1.67E-07
101		0.11	0.000	0.047	0.2918	0.1655	0.0000	1.67E-07
102		0.20	0.034	0.051	0.3029	0.1654	0.0000	1.67E-07
103		0.00	0.000	0.058	0.2971	0.1654	0.0000	1.67E-07
104		0.00	0.000	0.038	0.2933	0.1653	0.0000	1.67E-07
105		0.29	0.099	0.069	0.3051	0.1653	0.0000	1.67E-07
106	*	0.20	0.000	0.098	0.3070	0.1652	0.0000	1.67E-07
107		0.00	0.000	0.124	0.3026	0.1652	0.0000	1.66E-07
108		0.00	0.000	0.124	0.2903	0.1651	0.0000	1.66E-07
109		0.01	0.000	0.058	0.2854	0.1651	0.0000	1.66E-07
110		0.15	0.000	0.075	0.2925	0.1650	0.0000	1.66E-07
111		0.28	0.095	0.073	0.3033	0.1650	0.0000	1.66E-07
112		0.00	0.000	0.061	0.2972	0.1649	0.0000	1.66E-07
113		0.20	0.017	0.137	0.3014	0.1649	0.0000	1.66E-07
114		0.00	0.000	0.062	0.2952	0.1648	0.0000	1.66E-07
115		0.02	0.000	0.055	0.2921	0.1648	0.0000	1.66E-07
116		0.15	0.000	0.059	0.3017	0.1648	0.0000	1.66E-07
117		0.01	0.000	0.036	0.2988	0.1647	0.0000	1.66E-07
118		0.11	0.000	0.059	0.3040	0.1647	0.0000	1.66E-07
119		0.00	0.000	0.023	0.3018	0.1646	0.0000	1.66E-07
120		0.20	0.030	0.050	0.3133	0.1646	0.0000	1.66E-07

121	0.38	0.180	0.161	0.3172	0.1645	0.0000	1.66E-07
122	0.21	0.044	0.153	0.3181	0.1645	0.0000	1.66E-07
123	0.12	0.003	0.109	0.3188	0.1644	0.0000	1.66E-07
124	0.15	0.010	0.080	0.3252	0.1644	0.0000	1.66E-07
125	0.04	0.000	0.063	0.3230	0.1643	0.0000	1.66E-07
126	0.00	0.000	0.185	0.3045	0.1643	0.0000	1.66E-07
127	0.00	0.000	0.109	0.2936	0.1642	0.0000	1.66E-07
128	0.00	0.000	0.053	0.2884	0.1642	0.0000	1.66E-07
129	0.00	0.000	0.043	0.2841	0.1641	0.0000	1.66E-07
130	0.00	0.000	0.034	0.2806	0.1641	0.0000	1.65E-07
131	0.00	0.000	0.030	0.2776	0.1640	0.0000	1.65E-07
132	0.00	0.000	0.005	0.2771	0.1640	0.0000	1.65E-07
133	0.00	0.000	0.001	0.2770	0.1639	0.0000	1.65E-07
134	0.00	0.000	0.000	0.2770	0.1639	0.0000	1.65E-07
135	0.00	0.000	0.000	0.2770	0.1638	0.0000	1.65E-07
136	0.37	0.181	0.053	0.2905	0.1638	0.0000	1.65E-07
137	0.14	0.000	0.041	0.3006	0.1637	0.0000	1.65E-07
138	0.13	0.001	0.040	0.3097	0.1637	0.0000	1.65E-07
139	0.06	0.000	0.042	0.3114	0.1636	0.0000	1.65E-07
140	0.58	0.404	0.052	0.3241	0.1636	0.0000	1.65E-07
141	0.00	0.000	0.148	0.3093	0.1636	0.0000	1.65E-07
142	0.00	0.000	0.017	0.3076	0.1635	0.0000	1.65E-07
143	0.00	0.000	0.018	0.3057	0.1635	0.0000	1.65E-07
144	0.00	0.000	0.017	0.3040	0.1634	0.0000	1.65E-07
145	2.61	2.417	0.050	0.3187	0.1634	0.0000	1.65E-07
146	0.01	0.000	0.076	0.3117	0.1633	0.0000	1.65E-07
147	0.02	0.000	0.058	0.3081	0.1633	0.0000	1.65E-07
148	0.00	0.000	0.090	0.2996	0.1632	0.0000	1.65E-07
149	0.17	0.002	0.160	0.3006	0.1632	0.0000	1.65E-07
150	0.00	0.000	0.066	0.2940	0.1631	0.0000	1.65E-07
151	0.05	0.000	0.189	0.2803	0.1631	0.0000	1.65E-07
152	0.00	0.000	0.022	0.2781	0.1630	0.0000	1.65E-07

153	0.00	0.000	0.008	0.2773	0.1630	0.0000	1.64E-07
154	0.00	0.000	0.002	0.2771	0.1629	0.0000	1.64E-07
155	0.00	0.000	0.000	0.2770	0.1629	0.0000	1.64E-07
156	0.00	0.000	0.000	0.2770	0.1628	0.0000	1.64E-07
157	0.00	0.000	0.000	0.2770	0.1628	0.0000	1.64E-07
158	0.32	0.135	0.060	0.2893	0.1627	0.0000	1.64E-07
159	0.00	0.000	0.012	0.2882	0.1627	0.0000	1.64E-07
160	0.01	0.000	0.023	0.2864	0.1626	0.0000	1.64E-07
161	0.01	0.000	0.028	0.2848	0.1626	0.0000	1.64E-07
162	0.00	0.000	0.016	0.2832	0.1626	0.0000	1.64E-07
163	0.62	0.420	0.054	0.2982	0.1625	0.0000	1.64E-07
164	0.00	0.000	0.113	0.2869	0.1625	0.0000	1.64E-07
165	0.03	0.000	0.035	0.2866	0.1624	0.0000	1.64E-07
166	0.00	0.000	0.020	0.2846	0.1624	0.0000	1.64E-07
167	0.37	0.171	0.058	0.2985	0.1623	0.0000	1.64E-07
168	0.00	0.000	0.086	0.2899	0.1623	0.0000	1.64E-07
169	0.00	0.000	0.104	0.2795	0.1622	0.0000	1.64E-07
170	0.36	0.143	0.155	0.2860	0.1622	0.0000	1.64E-07
171	0.65	0.293	0.244	0.2970	0.1621	0.0000	1.64E-07
172	0.12	0.000	0.078	0.3007	0.1621	0.0000	1.64E-07
173	0.00	0.000	0.070	0.2937	0.1620	0.0000	1.64E-07
174	0.00	0.000	0.102	0.2835	0.1620	0.0000	1.64E-07
175	0.10	0.000	0.098	0.2834	0.1619	0.0000	1.64E-07
176	0.04	0.000	0.057	0.2820	0.1619	0.0000	1.63E-07
177	1.72	1.513	0.085	0.2938	0.1618	0.0000	1.63E-07
178	0.13	0.000	0.155	0.2915	0.1618	0.0000	1.63E-07
179	0.01	0.000	0.117	0.2809	0.1617	0.0000	1.63E-07
180	0.05	0.000	0.069	0.2794	0.1617	0.0000	1.63E-07
181	0.00	0.000	0.012	0.2781	0.1617	0.0000	1.63E-07
182	0.00	0.000	0.009	0.2772	0.1616	0.0000	1.63E-07
183	0.00	0.000	0.002	0.2770	0.1616	0.0000	1.63E-07
184	0.72	0.489	0.070	0.2928	0.1615	0.0000	1.63E-07

185	0.18	0.023	0.072	0.3012	0.1615	0.0000	1.63E-07
186	0.18	0.013	0.141	0.3042	0.1614	0.0000	1.63E-07
187	0.00	0.000	0.128	0.2914	0.1614	0.0000	1.63E-07
188	0.00	0.000	0.082	0.2832	0.1613	0.0000	1.63E-07
189	0.00	0.000	0.048	0.2784	0.1613	0.0000	1.63E-07
190	0.00	0.000	0.012	0.2772	0.1612	0.0000	1.63E-07
191	0.00	0.000	0.002	0.2771	0.1612	0.0000	1.63E-07
192	0.99	0.765	0.069	0.2929	0.1611	0.0000	1.63E-07
193	0.72	0.343	0.268	0.3040	0.1611	0.0000	1.63E-07
194	1.01	0.666	0.239	0.3146	0.1610	0.0000	1.63E-07
195	0.00	0.000	0.148	0.2998	0.1610	0.0000	1.63E-07
196	0.00	0.000	0.161	0.2836	0.1609	0.0000	1.63E-07
197	0.46	0.214	0.115	0.2970	0.1609	0.0000	1.63E-07
198	0.00	0.000	0.098	0.2872	0.1609	0.0000	1.63E-07
199	0.00	0.000	0.078	0.2795	0.1608	0.0000	1.62E-07
200	0.00	0.000	0.021	0.2774	0.1608	0.0000	1.62E-07
201	0.00	0.000	0.003	0.2771	0.1607	0.0000	1.62E-07
202	0.00	0.000	0.001	0.2770	0.1607	0.0000	1.62E-07
203	0.00	0.000	0.000	0.2770	0.1606	0.0000	1.62E-07
204	0.86	0.637	0.066	0.2931	0.1606	0.0000	1.62E-07
205	0.27	0.084	0.145	0.2972	0.1605	0.0000	1.62E-07
206	0.33	0.127	0.126	0.3049	0.1605	0.0000	1.62E-07
207	0.11	0.001	0.141	0.3017	0.1604	0.0000	1.62E-07
208	0.00	0.000	0.157	0.2860	0.1604	0.0000	1.62E-07
209	0.47	0.185	0.172	0.2971	0.1603	0.0000	1.62E-07
210	0.32	0.117	0.096	0.3082	0.1603	0.0000	1.62E-07
211	0.00	0.000	0.116	0.2966	0.1602	0.0000	1.62E-07
212	0.00	0.000	0.054	0.2913	0.1602	0.0000	1.62E-07
213	0.00	0.000	0.080	0.2832	0.1601	0.0000	1.62E-07
214	0.00	0.000	0.055	0.2778	0.1601	0.0000	1.62E-07
215	0.00	0.000	0.006	0.2772	0.1601	0.0000	1.62E-07
216	0.00	0.000	0.004	0.2770	0.1600	0.0000	1.62E-07

217	0.27	0.102	0.059	0.2884	0.1600	0.0000	1.62E-07
218	0.00	0.000	0.022	0.2862	0.1599	0.0000	1.62E-07
219	0.00	0.000	0.028	0.2834	0.1599	0.0000	1.62E-07
220	0.00	0.000	0.033	0.2802	0.1598	0.0000	1.62E-07
221	0.00	0.000	0.021	0.2781	0.1598	0.0000	1.62E-07
222	0.00	0.000	0.009	0.2772	0.1597	0.0000	1.61E-07
223	0.00	0.000	0.001	0.2770	0.1597	0.0000	1.61E-07
224	0.00	0.000	0.000	0.2770	0.1596	0.0000	1.61E-07
225	0.00	0.000	0.000	0.2770	0.1596	0.0000	1.61E-07
226	0.00	0.000	0.000	0.2770	0.1595	0.0000	1.61E-07
227	0.00	0.000	0.000	0.2770	0.1595	0.0000	1.61E-07
228	0.00	0.000	0.000	0.2770	0.1595	0.0000	1.61E-07
229	0.00	0.000	0.000	0.2770	0.1594	0.0000	1.61E-07
230	0.41	0.213	0.054	0.2908	0.1594	0.0000	1.61E-07
231	0.47	0.298	0.060	0.3015	0.1593	0.0000	1.61E-07
232	0.00	0.000	0.056	0.2960	0.1593	0.0000	1.61E-07
233	0.00	0.000	0.047	0.2913	0.1592	0.0000	1.61E-07
234	0.00	0.000	0.120	0.2793	0.1592	0.0000	1.61E-07
235	0.00	0.000	0.017	0.2776	0.1591	0.0000	1.61E-07
236	0.00	0.000	0.004	0.2771	0.1591	0.0000	1.61E-07
237	0.61	0.372	0.088	0.2919	0.1590	0.0000	1.61E-07
238	0.00	0.000	0.034	0.2885	0.1590	0.0000	1.61E-07
239	0.00	0.000	0.031	0.2855	0.1589	0.0000	1.61E-07
240	0.00	0.000	0.027	0.2827	0.1589	0.0000	1.61E-07
241	0.00	0.000	0.029	0.2799	0.1589	0.0000	1.61E-07
242	0.13	0.000	0.055	0.2874	0.1588	0.0000	1.61E-07
243	0.00	0.000	0.023	0.2851	0.1588	0.0000	1.61E-07
244	0.00	0.000	0.023	0.2828	0.1587	0.0000	1.61E-07
245	0.00	0.000	0.028	0.2800	0.1587	0.0000	1.60E-07
246	0.00	0.000	0.024	0.2775	0.1586	0.0000	1.60E-07
247	0.00	0.000	0.004	0.2771	0.1586	0.0000	1.60E-07
248	0.00	0.000	0.001	0.2770	0.1585	0.0000	1.60E-07

249	0.00	0.000	0.000	0.2770	0.1585	0.0000	1.60E-07
250	0.00	0.000	0.000	0.2770	0.1584	0.0000	1.60E-07
251	0.00	0.000	0.000	0.2770	0.1584	0.0000	1.60E-07
252	0.00	0.000	0.000	0.2770	0.1583	0.0000	1.60E-07
253	0.00	0.000	0.000	0.2770	0.1583	0.0000	1.60E-07
254	0.00	0.000	0.000	0.2770	0.1583	0.0000	1.60E-07
255	0.06	0.000	0.030	0.2798	0.1582	0.0000	1.60E-07
256	0.00	0.000	0.002	0.2797	0.1582	0.0000	1.60E-07
257	0.00	0.000	0.006	0.2790	0.1581	0.0000	1.60E-07
258	0.00	0.000	0.004	0.2786	0.1581	0.0000	1.60E-07
259	0.00	0.000	0.004	0.2783	0.1580	0.0000	1.60E-07
260	0.00	0.000	0.003	0.2779	0.1580	0.0000	1.60E-07
261	0.00	0.000	0.004	0.2776	0.1579	0.0000	1.60E-07
262	0.00	0.000	0.003	0.2773	0.1579	0.0000	1.60E-07
263	0.08	0.000	0.034	0.2817	0.1578	0.0000	1.60E-07
264	0.00	0.000	0.009	0.2808	0.1578	0.0000	1.60E-07
265	0.02	0.000	0.027	0.2805	0.1577	0.0000	1.60E-07
266	0.00	0.000	0.008	0.2797	0.1577	0.0000	1.60E-07
267	0.00	0.000	0.006	0.2791	0.1577	0.0000	1.60E-07
268	0.00	0.000	0.004	0.2787	0.1576	0.0000	1.60E-07
269	0.00	0.000	0.004	0.2783	0.1576	0.0000	1.59E-07
270	0.00	0.000	0.004	0.2779	0.1575	0.0000	1.59E-07
271	0.00	0.000	0.004	0.2776	0.1575	0.0000	1.59E-07
272	0.06	0.000	0.031	0.2807	0.1574	0.0000	1.59E-07
273	0.00	0.000	0.002	0.2806	0.1574	0.0000	1.59E-07
274	0.00	0.000	0.006	0.2800	0.1573	0.0000	1.59E-07
275	0.00	0.000	0.008	0.2793	0.1573	0.0000	1.59E-07
276	0.00	0.000	0.005	0.2789	0.1572	0.0000	1.59E-07
277	0.00	0.000	0.003	0.2785	0.1572	0.0000	1.59E-07
278	0.00	0.000	0.003	0.2782	0.1571	0.0000	1.59E-07
279	0.00	0.000	0.003	0.2780	0.1571	0.0000	1.59E-07
280	0.00	0.000	0.003	0.2777	0.1571	0.0000	1.59E-07

281		0.14	0.000	0.036	0.2883	0.1570	0.0000	1.59E-07
282		0.30	0.121	0.046	0.3013	0.1570	0.0000	1.59E-07
283		0.00	0.000	0.005	0.3008	0.1569	0.0000	1.59E-07
284		0.00	0.000	0.007	0.3001	0.1569	0.0000	1.59E-07
285		0.00	0.000	0.007	0.2993	0.1568	0.0000	1.59E-07
286		0.00	0.000	0.009	0.2985	0.1568	0.0000	1.59E-07
287		0.00	0.000	0.007	0.2978	0.1567	0.0000	1.59E-07
288		0.00	0.000	0.007	0.2971	0.1567	0.0000	1.59E-07
289		0.00	0.000	0.007	0.2963	0.1566	0.0000	1.59E-07
290		0.00	0.000	0.007	0.2956	0.1566	0.0000	1.59E-07
291		0.00	0.000	0.007	0.2949	0.1565	0.0000	1.59E-07
292		0.00	0.000	0.007	0.2942	0.1565	0.0000	1.59E-07
293		0.07	0.000	0.035	0.2973	0.1565	0.0000	1.58E-07
294		0.10	0.000	0.040	0.3032	0.1564	0.0000	1.58E-07
295		0.00	0.000	0.008	0.3024	0.1564	0.0000	1.58E-07
296		0.00	0.000	0.006	0.3018	0.1563	0.0000	1.58E-07
297		0.00	0.000	0.006	0.3012	0.1563	0.0000	1.58E-07
298		0.00	0.000	0.006	0.3006	0.1562	0.0000	1.58E-07
299		0.00	0.000	0.006	0.3001	0.1562	0.0000	1.58E-07
300		0.00	0.000	0.005	0.2995	0.1561	0.0000	1.58E-07
301	*	0.00	0.000	0.005	0.2990	0.1561	0.0000	1.58E-07
302		0.00	0.000	0.005	0.2985	0.1561	0.0000	1.58E-07
303		0.00	0.000	0.005	0.2979	0.1560	0.0000	1.58E-07
304	*	0.00	0.000	0.000	0.2979	0.1560	0.0000	1.58E-07
305		0.00	0.000	0.005	0.2974	0.1559	0.0000	1.58E-07
306	*	0.00	0.000	0.005	0.2969	0.1559	0.0000	1.58E-07
307		0.00	0.000	0.005	0.2964	0.1558	0.0000	1.58E-07
308		0.00	0.000	0.005	0.2958	0.1558	0.0000	1.58E-07
309		0.00	0.000	0.005	0.2953	0.1557	0.0000	1.58E-07
310		0.00	0.000	0.005	0.2948	0.1557	0.0000	1.58E-07
311		0.00	0.000	0.005	0.2943	0.1556	0.0000	1.58E-07
312		0.00	0.000	0.005	0.2938	0.1556	0.0000	1.58E-07

313		0.06	0.000	0.033	0.2963	0.1556	0.0000	1.58E-07
314		0.00	0.000	0.006	0.2957	0.1555	0.0000	1.58E-07
315		0.02	0.000	0.023	0.2958	0.1555	0.0000	1.58E-07
316		1.21	1.036	0.042	0.3090	0.1554	0.0000	1.57E-07
317		0.00	0.000	0.061	0.3029	0.1554	0.0000	1.57E-07
318		0.01	0.000	0.055	0.2982	0.1553	0.0000	1.57E-07
319		0.00	0.000	0.084	0.2897	0.1553	0.0000	1.57E-07
320		0.00	0.000	0.079	0.2818	0.1552	0.0000	1.57E-07
321		0.03	0.000	0.069	0.2779	0.1552	0.0000	1.57E-07
322		0.01	0.000	0.017	0.2774	0.1551	0.0000	1.57E-07
323		0.07	0.000	0.035	0.2805	0.1551	0.0000	1.57E-07
324		0.12	0.000	0.036	0.2885	0.1551	0.0000	1.57E-07
325		0.26	0.092	0.050	0.3003	0.1550	0.0000	1.57E-07
326		0.00	0.000	0.012	0.2991	0.1550	0.0000	1.57E-07
327		0.13	0.000	0.079	0.3040	0.1549	0.0000	1.57E-07
328		0.04	0.000	0.042	0.3035	0.1549	0.0000	1.57E-07
329		0.00	0.000	0.033	0.3002	0.1548	0.0000	1.57E-07
330		0.00	0.000	0.079	0.2923	0.1548	0.0000	1.57E-07
331		0.00	0.000	0.036	0.2887	0.1547	0.0000	1.57E-07
332		0.00	0.000	0.025	0.2861	0.1547	0.0000	1.57E-07
333		0.00	0.000	0.020	0.2841	0.1546	0.0000	1.57E-07
334		0.00	0.000	0.025	0.2816	0.1546	0.0000	1.57E-07
335		0.00	0.000	0.023	0.2794	0.1546	0.0000	1.57E-07
336		0.10	0.000	0.053	0.2842	0.1545	0.0000	1.57E-07
337		1.18	0.992	0.057	0.2971	0.1545	0.0000	1.57E-07
338		0.01	0.000	0.026	0.2958	0.1544	0.0000	1.57E-07
339	*	0.17	0.000	0.044	0.2977	0.1544	0.0000	1.57E-07
340		0.02	0.000	0.055	0.3053	0.1543	0.0000	1.56E-07
341	*	0.50	0.000	0.029	0.3073	0.1543	0.0000	1.56E-07
342		0.00	0.115	0.027	0.3200	0.1542	0.0000	1.56E-07
343		0.38	0.443	0.000	0.3316	0.1542	0.0000	1.56E-07
344	*	0.22	0.000	0.022	0.3336	0.1542	0.0000	1.56E-07

345	*	0.34	0.000	0.023	0.3356	0.1541	0.0000	1.56E-07
346	*	0.00	0.000	0.022	0.3376	0.1541	0.0000	1.56E-07
347	*	0.00	0.000	0.023	0.3395	0.1540	0.0000	1.56E-07
348	*	0.00	0.000	0.022	0.3415	0.1540	0.0000	1.56E-07
349	*	0.00	0.000	0.009	0.3435	0.1539	0.0000	1.56E-07
350	*	0.01	0.000	0.000	0.3454	0.1539	0.0000	1.56E-07
351		0.24	0.416	0.013	0.3582	0.1538	0.0000	1.56E-07
352		0.00	0.000	0.064	0.3518	0.1538	0.0000	1.56E-07
353		0.00	0.000	0.095	0.3423	0.1537	0.0000	1.56E-07
354		0.00	0.000	0.070	0.3352	0.1537	0.0000	1.56E-07
355		0.00	0.000	0.059	0.3293	0.1537	0.0000	1.56E-07
356		0.00	0.000	0.034	0.3259	0.1536	0.0000	1.56E-07
357		0.00	0.000	0.053	0.3206	0.1536	0.0000	1.56E-07
358		0.00	0.000	0.051	0.3155	0.1535	0.0000	1.56E-07
359		0.00	0.000	0.121	0.3033	0.1535	0.0000	1.56E-07
360		0.00	0.000	0.038	0.2995	0.1534	0.0000	1.56E-07
361	*	0.00	0.000	0.000	0.2995	0.1534	0.0000	1.56E-07
362	*	0.00	0.000	0.000	0.2995	0.1533	0.0000	1.56E-07
363	*	0.19	0.000	0.044	0.3015	0.1533	0.0000	1.56E-07
364		0.02	0.000	0.073	0.3090	0.1533	0.0000	1.55E-07
365		0.89	0.662	0.097	0.3225	0.1532	0.0000	1.55E-07

* = Frozen (air or soil)

Annual Totals for Year 25			
	inches	cubic feet	percent
Precipitation	32.32	117,337.9	100.00
Runoff	17.289	62,758.1	53.48
Evapotranspiration	14.681	53,290.3	45.42
Recirculation into Layer 1	0.0067	24.3	0.02
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0067	24.3	0.02
Percolation/Leakage through Layer 5	0.000060	0.2161	0.00
Average Head on Top of Layer 4	0.1615	---	---
Change in Water Storage	0.3552	1,289.2	1.10
Soil Water at Start of Year	1,406.6135	5,106,006.9	4351.54
Soil Water at End of Year	1,406.9686	5,107,296.1	4352.64
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0067	-24.3	-0.02

Daily Output for Year 26

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.00	0.000	0.033	0.3192	0.1532	0.0000	1.55E-07
2			0.00	0.000	0.035	0.3157	0.1531	0.0000	1.55E-07
3			0.00	0.000	0.044	0.3113	0.1531	0.0000	1.55E-07
4			1.15	0.955	0.057	0.3255	0.1530	0.0000	1.55E-07
5			0.00	0.000	0.029	0.3225	0.1530	0.0000	1.55E-07
6			0.00	0.000	0.032	0.3194	0.1529	0.0000	1.55E-07
7	*		0.00	0.000	0.014	0.3179	0.1529	0.0000	1.55E-07
8			0.00	0.000	0.030	0.3149	0.1528	0.0000	1.55E-07
9			0.00	0.000	0.043	0.3106	0.1528	0.0000	1.55E-07
10			0.00	0.000	0.048	0.3058	0.1528	0.0000	1.55E-07
11			0.00	0.000	0.046	0.3013	0.1527	0.0000	1.55E-07
12	*		0.22	0.000	0.037	0.3032	0.1527	0.0000	1.55E-07
13	*		0.00	0.000	0.041	0.3052	0.1526	0.0000	1.55E-07
14	*		0.01	0.000	0.021	0.3072	0.1526	0.0000	1.55E-07
15	*		0.00	0.000	0.025	0.3091	0.1525	0.0000	1.55E-07
16	*		0.01	0.000	0.028	0.3091	0.1525	0.0000	1.55E-07
17			0.00	0.000	0.036	0.3055	0.1524	0.0000	1.55E-07
18			0.00	0.000	0.021	0.3035	0.1524	0.0000	1.55E-07
19			0.00	0.000	0.027	0.3008	0.1524	0.0000	1.55E-07
20			0.00	0.000	0.037	0.2970	0.1523	0.0000	1.55E-07
21			0.00	0.000	0.031	0.2939	0.1523	0.0000	1.55E-07
22			0.00	0.000	0.049	0.2891	0.1522	0.0000	1.55E-07
23	*		0.00	0.000	0.021	0.2869	0.1522	0.0000	1.55E-07
24	*		0.00	0.000	0.016	0.2854	0.1521	0.0000	1.54E-07

25	*	0.08	0.000	0.020	0.2873	0.1521	0.0000	1.54E-07
26	*	0.00	0.000	0.057	0.2853	0.1520	0.0000	1.54E-07
27	*	0.26	0.000	0.018	0.2873	0.1520	0.0000	1.54E-07
28	*	0.06	0.000	0.010	0.2893	0.1520	0.0000	1.54E-07
29		0.00	0.117	0.000	0.3020	0.1519	0.0000	1.54E-07
30		0.00	0.000	0.052	0.2977	0.1519	0.0000	1.54E-07
31		0.00	0.000	0.048	0.2930	0.1518	0.0000	1.54E-07
32		0.00	0.000	0.078	0.2856	0.1518	0.0000	1.54E-07
33		0.00	0.000	0.031	0.2824	0.1517	0.0000	1.54E-07
34		0.00	0.000	0.014	0.2810	0.1517	0.0000	1.54E-07
35		0.00	0.000	0.033	0.2777	0.1516	0.0000	1.54E-07
36		0.00	0.000	0.005	0.2771	0.1516	0.0000	1.54E-07
37	*	0.00	0.000	0.001	0.2770	0.1516	0.0000	1.54E-07
38	*	0.48	0.000	0.018	0.2790	0.1515	0.0000	1.54E-07
39		0.00	0.269	0.032	0.2933	0.1515	0.0000	1.54E-07
40		0.00	0.000	0.041	0.2892	0.1515	0.0000	1.54E-07
41		0.33	0.127	0.060	0.3037	0.1515	0.0000	1.54E-07
42	*	0.00	0.000	0.000	0.3037	0.1515	0.0000	1.54E-07
43	*	0.00	0.000	0.011	0.3026	0.1514	0.0000	1.54E-07
44		0.00	0.000	0.024	0.3002	0.1514	0.0000	1.54E-07
45		0.00	0.000	0.028	0.2974	0.1513	0.0000	1.54E-07
46	*	0.15	0.000	0.072	0.2994	0.1513	0.0000	1.54E-07
47		0.50	0.422	0.008	0.3122	0.1513	0.0000	1.54E-07
48		0.50	0.289	0.093	0.3238	0.1512	0.0000	1.54E-07
49		0.02	0.000	0.081	0.3179	0.1512	0.0000	1.54E-07
50		0.00	0.000	0.031	0.3148	0.1511	0.0000	1.54E-07
51		0.00	0.000	0.047	0.3101	0.1511	0.0000	1.53E-07
52		0.00	0.000	0.068	0.3033	0.1510	0.0000	1.53E-07
53		0.30	0.124	0.102	0.3104	0.1510	0.0000	1.53E-07
54		0.10	0.000	0.105	0.3097	0.1509	0.0000	1.53E-07
55		0.08	0.000	0.067	0.3114	0.1509	0.0000	1.53E-07
56		0.70	0.476	0.084	0.3252	0.1509	0.0000	1.53E-07

57		0.00	0.000	0.055	0.3197	0.1508	0.0000	1.53E-07
58		0.00	0.000	0.063	0.3134	0.1508	0.0000	1.53E-07
59	*	0.00	0.000	0.000	0.3134	0.1507	0.0000	1.53E-07
60	*	0.00	0.000	0.019	0.3115	0.1507	0.0000	1.53E-07
61		0.00	0.000	0.077	0.3038	0.1506	0.0000	1.53E-07
62		0.00	0.000	0.028	0.3011	0.1506	0.0000	1.53E-07
63	*	0.00	0.000	0.000	0.3011	0.1505	0.0000	1.53E-07
64	*	0.00	0.000	0.000	0.3011	0.1505	0.0000	1.53E-07
65	*	0.00	0.000	0.000	0.3011	0.1505	0.0000	1.53E-07
66	*	0.00	0.000	0.000	0.3011	0.1504	0.0000	1.53E-07
67	*	0.00	0.000	0.000	0.3011	0.1504	0.0000	1.53E-07
68	*	0.15	0.000	0.011	0.3031	0.1503	0.0000	1.53E-07
69	*	0.00	0.000	0.045	0.3050	0.1503	0.0000	1.53E-07
70	*	0.00	0.000	0.040	0.3066	0.1502	0.0000	1.53E-07
71		0.00	0.000	0.042	0.3024	0.1502	0.0000	1.53E-07
72		0.00	0.000	0.115	0.2909	0.1502	0.0000	1.53E-07
73		0.00	0.000	0.094	0.2816	0.1501	0.0000	1.53E-07
74		0.00	0.000	0.042	0.2773	0.1501	0.0000	1.53E-07
75		0.00	0.000	0.003	0.2770	0.1500	0.0000	1.53E-07
76	*	0.00	0.000	0.000	0.2770	0.1500	0.0000	1.52E-07
77	*	0.00	0.000	0.000	0.2770	0.1499	0.0000	1.52E-07
78		0.00	0.000	0.000	0.2770	0.1499	0.0000	1.52E-07
79		0.00	0.000	0.000	0.2770	0.1498	0.0000	1.52E-07
80	*	0.68	0.000	0.042	0.2790	0.1498	0.0000	1.52E-07
81	*	2.34	0.000	0.000	0.2809	0.1498	0.0000	1.52E-07
82	*	0.00	0.000	0.015	0.2829	0.1497	0.0000	1.52E-07
83		0.02	0.559	0.000	0.2956	0.1497	0.0000	1.52E-07
84		0.57	1.534	0.000	0.3073	0.1496	0.0000	1.52E-07
85		0.01	1.046	0.000	0.3189	0.1496	0.0000	1.52E-07
86		0.06	0.000	0.048	0.3198	0.1495	0.0000	1.52E-07
87		0.04	0.000	0.064	0.3177	0.1495	0.0000	1.52E-07
88		0.01	0.000	0.039	0.3144	0.1495	0.0000	1.52E-07

89		0.00	0.000	0.099	0.3045	0.1494	0.0000	1.52E-07
90		0.00	0.000	0.113	0.2932	0.1494	0.0000	1.52E-07
91		0.00	0.000	0.124	0.2808	0.1493	0.0000	1.52E-07
92		0.04	0.000	0.064	0.2781	0.1493	0.0000	1.52E-07
93		0.00	0.000	0.007	0.2774	0.1492	0.0000	1.52E-07
94		0.00	0.000	0.003	0.2771	0.1492	0.0000	1.52E-07
95	*	0.35	0.000	0.044	0.2791	0.1491	0.0000	1.52E-07
96		0.09	0.199	0.032	0.2934	0.1491	0.0000	1.52E-07
97		0.00	0.000	0.041	0.2893	0.1491	0.0000	1.52E-07
98		0.00	0.000	0.104	0.2789	0.1490	0.0000	1.52E-07
99		0.00	0.000	0.016	0.2773	0.1490	0.0000	1.52E-07
100	*	0.03	0.000	0.036	0.2771	0.1489	0.0000	1.51E-07
101		0.41	0.201	0.074	0.2907	0.1489	0.0000	1.51E-07
102		0.08	0.000	0.045	0.2946	0.1488	0.0000	1.51E-07
103		0.01	0.000	0.026	0.2930	0.1488	0.0000	1.51E-07
104		0.00	0.000	0.017	0.2913	0.1488	0.0000	1.51E-07
105		0.00	0.000	0.017	0.2896	0.1487	0.0000	1.51E-07
106		0.01	0.000	0.026	0.2881	0.1487	0.0000	1.51E-07
107		0.00	0.000	0.015	0.2866	0.1486	0.0000	1.51E-07
108		0.00	0.000	0.015	0.2852	0.1486	0.0000	1.51E-07
109		0.00	0.000	0.014	0.2838	0.1485	0.0000	1.51E-07
110	*	0.00	0.000	0.000	0.2838	0.1485	0.0000	1.51E-07
111	*	0.00	0.000	0.013	0.2825	0.1485	0.0000	1.51E-07
112		0.00	0.000	0.013	0.2812	0.1484	0.0000	1.51E-07
113		0.00	0.000	0.012	0.2800	0.1484	0.0000	1.51E-07
114		1.24	1.027	0.050	0.2960	0.1483	0.0000	1.51E-07
115		0.54	0.326	0.099	0.3076	0.1483	0.0000	1.51E-07
116		0.00	0.000	0.102	0.2974	0.1482	0.0000	1.51E-07
117		0.00	0.000	0.036	0.2938	0.1482	0.0000	1.51E-07
118		0.00	0.000	0.051	0.2887	0.1481	0.0000	1.51E-07
119		0.00	0.000	0.108	0.2779	0.1481	0.0000	1.51E-07
120		0.00	0.000	0.007	0.2772	0.1481	0.0000	1.51E-07

121	0.31	0.123	0.105	0.2854	0.1480	0.0000	1.51E-07
122	0.15	0.000	0.102	0.2905	0.1480	0.0000	1.51E-07
123	0.10	0.000	0.105	0.2895	0.1479	0.0000	1.51E-07
124	0.00	0.000	0.085	0.2811	0.1479	0.0000	1.51E-07
125	0.00	0.000	0.029	0.2782	0.1478	0.0000	1.50E-07
126	0.00	0.000	0.010	0.2773	0.1478	0.0000	1.50E-07
127	2.03	1.795	0.069	0.2935	0.1478	0.0000	1.50E-07
128	0.00	0.000	0.066	0.2869	0.1477	0.0000	1.50E-07
129	0.00	0.000	0.077	0.2792	0.1477	0.0000	1.50E-07
130	0.00	0.000	0.019	0.2773	0.1476	0.0000	1.50E-07
131	0.00	0.000	0.002	0.2771	0.1476	0.0000	1.50E-07
132	0.00	0.000	0.001	0.2770	0.1475	0.0000	1.50E-07
133	0.00	0.000	0.000	0.2770	0.1475	0.0000	1.50E-07
134	0.02	0.000	0.017	0.2771	0.1475	0.0000	1.50E-07
135	0.09	0.000	0.034	0.2828	0.1474	0.0000	1.50E-07
136	0.09	0.000	0.043	0.2873	0.1474	0.0000	1.50E-07
137	0.40	0.201	0.060	0.3010	0.1473	0.0000	1.50E-07
138	0.32	0.148	0.059	0.3124	0.1473	0.0000	1.50E-07
139	0.00	0.000	0.097	0.3028	0.1472	0.0000	1.50E-07
140	0.00	0.000	0.057	0.2971	0.1472	0.0000	1.50E-07
141	1.06	0.750	0.163	0.3118	0.1472	0.0000	1.50E-07
142	0.03	0.000	0.111	0.3038	0.1471	0.0000	1.50E-07
143	0.00	0.000	0.091	0.2947	0.1471	0.0000	1.50E-07
144	0.10	0.000	0.178	0.2869	0.1470	0.0000	1.50E-07
145	0.01	0.000	0.077	0.2803	0.1470	0.0000	1.50E-07
146	0.98	0.663	0.166	0.2957	0.1469	0.0000	1.50E-07
147	0.00	0.000	0.057	0.2901	0.1469	0.0000	1.50E-07
148	0.18	0.016	0.091	0.2976	0.1469	0.0000	1.50E-07
149	0.02	0.000	0.055	0.2941	0.1468	0.0000	1.50E-07
150	0.10	0.000	0.081	0.2957	0.1468	0.0000	1.49E-07
151	0.03	0.000	0.131	0.2861	0.1467	0.0000	1.49E-07
152	0.44	0.155	0.167	0.2980	0.1467	0.0000	1.49E-07

153	0.18	0.011	0.159	0.2988	0.1466	0.0000	1.49E-07
154	1.14	0.815	0.207	0.3101	0.1466	0.0000	1.49E-07
155	0.00	0.000	0.162	0.2938	0.1466	0.0000	1.49E-07
156	0.00	0.000	0.139	0.2799	0.1465	0.0000	1.49E-07
157	0.00	0.000	0.022	0.2777	0.1465	0.0000	1.49E-07
158	0.19	0.020	0.062	0.2887	0.1464	0.0000	1.49E-07
159	0.06	0.000	0.049	0.2898	0.1464	0.0000	1.49E-07
160	0.79	0.588	0.072	0.3028	0.1463	0.0000	1.49E-07
161	0.01	0.000	0.106	0.2936	0.1463	0.0000	1.49E-07
162	0.00	0.000	0.120	0.2816	0.1463	0.0000	1.49E-07
163	0.00	0.000	0.040	0.2776	0.1462	0.0000	1.49E-07
164	0.00	0.000	0.004	0.2771	0.1462	0.0000	1.49E-07
165	0.25	0.084	0.053	0.2889	0.1461	0.0000	1.49E-07
166	0.19	0.033	0.050	0.2992	0.1461	0.0000	1.49E-07
167	0.95	0.767	0.066	0.3106	0.1460	0.0000	1.49E-07
168	0.00	0.000	0.103	0.3004	0.1460	0.0000	1.49E-07
169	0.00	0.000	0.119	0.2884	0.1460	0.0000	1.49E-07
170	0.00	0.000	0.095	0.2789	0.1459	0.0000	1.49E-07
171	0.29	0.119	0.085	0.2879	0.1459	0.0000	1.49E-07
172	0.00	0.000	0.028	0.2852	0.1458	0.0000	1.49E-07
173	0.28	0.105	0.064	0.2967	0.1458	0.0000	1.49E-07
174	0.77	0.530	0.122	0.3081	0.1457	0.0000	1.49E-07
175	0.39	0.195	0.109	0.3171	0.1457	0.0000	1.48E-07
176	2.08	1.736	0.235	0.3284	0.1457	0.0000	1.48E-07
177	0.00	0.000	0.045	0.3238	0.1456	0.0000	1.48E-07
178	1.11	0.858	0.099	0.3387	0.1456	0.0000	1.48E-07
179	0.14	0.017	0.236	0.3271	0.1455	0.0000	1.48E-07
180	0.02	0.000	0.086	0.3205	0.1455	0.0000	1.48E-07
181	0.00	0.000	0.203	0.3002	0.1454	0.0000	1.48E-07
182	0.00	0.000	0.172	0.2830	0.1454	0.0000	1.48E-07
183	0.00	0.000	0.053	0.2777	0.1454	0.0000	1.48E-07
184	0.00	0.000	0.005	0.2772	0.1453	0.0000	1.48E-07

185	0.00	0.000	0.002	0.2770	0.1453	0.0000	1.48E-07
186	0.00	0.000	0.000	0.2770	0.1452	0.0000	1.48E-07
187	0.00	0.000	0.000	0.2770	0.1452	0.0000	1.48E-07
188	0.00	0.000	0.000	0.2770	0.1451	0.0000	1.48E-07
189	0.06	0.000	0.031	0.2801	0.1451	0.0000	1.48E-07
190	0.00	0.000	0.002	0.2799	0.1451	0.0000	1.48E-07
191	0.00	0.000	0.011	0.2791	0.1450	0.0000	1.48E-07
192	0.11	0.000	0.036	0.2860	0.1450	0.0000	1.48E-07
193	0.02	0.000	0.027	0.2855	0.1449	0.0000	1.48E-07
194	0.01	0.000	0.027	0.2840	0.1449	0.0000	1.48E-07
195	0.92	0.730	0.057	0.2974	0.1449	0.0000	1.48E-07
196	0.34	0.135	0.093	0.3087	0.1448	0.0000	1.48E-07
197	0.29	0.127	0.100	0.3145	0.1448	0.0000	1.48E-07
198	0.00	0.000	0.166	0.2981	0.1447	0.0000	1.48E-07
199	0.00	0.000	0.168	0.2813	0.1447	0.0000	1.48E-07
200	0.00	0.000	0.033	0.2780	0.1446	0.0000	1.48E-07
201	0.00	0.000	0.008	0.2772	0.1446	0.0000	1.47E-07
202	0.00	0.000	0.002	0.2770	0.1446	0.0000	1.47E-07
203	0.00	0.000	0.000	0.2770	0.1445	0.0000	1.47E-07
204	0.00	0.000	0.000	0.2770	0.1445	0.0000	1.47E-07
205	0.00	0.000	0.000	0.2770	0.1444	0.0000	1.47E-07
206	0.87	0.648	0.061	0.2931	0.1444	0.0000	1.47E-07
207	0.66	0.407	0.143	0.3046	0.1443	0.0000	1.47E-07
208	0.00	0.000	0.107	0.2939	0.1443	0.0000	1.47E-07
209	0.00	0.000	0.056	0.2883	0.1443	0.0000	1.47E-07
210	0.00	0.000	0.065	0.2818	0.1442	0.0000	1.47E-07
211	0.04	0.000	0.065	0.2796	0.1442	0.0000	1.47E-07
212	0.00	0.000	0.013	0.2783	0.1441	0.0000	1.47E-07
213	0.00	0.000	0.010	0.2773	0.1441	0.0000	1.47E-07
214	0.00	0.000	0.003	0.2770	0.1440	0.0000	1.47E-07
215	0.52	0.308	0.065	0.2921	0.1440	0.0000	1.47E-07
216	0.01	0.000	0.093	0.2841	0.1440	0.0000	1.47E-07

217	0.00	0.000	0.023	0.2818	0.1439	0.0000	1.47E-07
218	0.81	0.592	0.062	0.2978	0.1439	0.0000	1.47E-07
219	0.44	0.228	0.103	0.3090	0.1438	0.0000	1.47E-07
220	0.00	0.000	0.064	0.3027	0.1438	0.0000	1.47E-07
221	0.05	0.000	0.076	0.3004	0.1438	0.0000	1.47E-07
222	0.12	0.000	0.151	0.2972	0.1437	0.0000	1.47E-07
223	0.00	0.000	0.140	0.2832	0.1437	0.0000	1.47E-07
224	0.00	0.000	0.044	0.2788	0.1436	0.0000	1.47E-07
225	0.00	0.000	0.014	0.2775	0.1436	0.0000	1.47E-07
226	0.00	0.000	0.004	0.2771	0.1435	0.0000	1.46E-07
227	0.00	0.000	0.001	0.2770	0.1435	0.0000	1.46E-07
228	0.00	0.000	0.000	0.2770	0.1435	0.0000	1.46E-07
229	0.00	0.000	0.000	0.2770	0.1434	0.0000	1.46E-07
230	0.06	0.000	0.031	0.2795	0.1434	0.0000	1.46E-07
231	0.00	0.000	0.003	0.2792	0.1433	0.0000	1.46E-07
232	0.00	0.000	0.007	0.2786	0.1433	0.0000	1.46E-07
233	0.00	0.000	0.006	0.2780	0.1433	0.0000	1.46E-07
234	0.00	0.000	0.006	0.2774	0.1432	0.0000	1.46E-07
235	0.00	0.000	0.003	0.2771	0.1432	0.0000	1.46E-07
236	0.00	0.000	0.001	0.2770	0.1431	0.0000	1.46E-07
237	0.00	0.000	0.000	0.2770	0.1431	0.0000	1.46E-07
238	0.00	0.000	0.000	0.2770	0.1430	0.0000	1.46E-07
239	0.00	0.000	0.000	0.2770	0.1430	0.0000	1.46E-07
240	0.07	0.000	0.032	0.2808	0.1430	0.0000	1.46E-07
241	0.60	0.423	0.055	0.2929	0.1429	0.0000	1.46E-07
242	0.00	0.000	0.009	0.2920	0.1429	0.0000	1.46E-07
243	0.00	0.000	0.013	0.2907	0.1428	0.0000	1.46E-07
244	0.00	0.000	0.018	0.2889	0.1428	0.0000	1.46E-07
245	0.00	0.000	0.015	0.2874	0.1427	0.0000	1.46E-07
246	1.76	1.565	0.054	0.3019	0.1427	0.0000	1.46E-07
247	0.14	0.002	0.076	0.3076	0.1427	0.0000	1.46E-07
248	0.00	0.000	0.039	0.3042	0.1426	0.0000	1.46E-07

249		0.00	0.000	0.032	0.3009	0.1426	0.0000	1.46E-07
250		0.00	0.000	0.032	0.2978	0.1425	0.0000	1.46E-07
251		0.00	0.000	0.076	0.2902	0.1425	0.0000	1.46E-07
252		0.00	0.000	0.098	0.2804	0.1425	0.0000	1.45E-07
253		0.00	0.000	0.026	0.2777	0.1424	0.0000	1.45E-07
254		0.00	0.000	0.006	0.2771	0.1424	0.0000	1.45E-07
255		0.00	0.000	0.001	0.2770	0.1423	0.0000	1.45E-07
256		0.00	0.000	0.000	0.2770	0.1423	0.0000	1.45E-07
257		0.37	0.163	0.071	0.2903	0.1423	0.0000	1.45E-07
258		0.00	0.000	0.017	0.2886	0.1422	0.0000	1.45E-07
259		0.00	0.000	0.023	0.2863	0.1422	0.0000	1.45E-07
260		0.64	0.426	0.065	0.3010	0.1421	0.0000	1.45E-07
261		0.00	0.000	0.059	0.2951	0.1421	0.0000	1.45E-07
262		0.00	0.000	0.127	0.2824	0.1420	0.0000	1.45E-07
263		0.00	0.000	0.043	0.2781	0.1420	0.0000	1.45E-07
264		0.00	0.000	0.010	0.2772	0.1420	0.0000	1.45E-07
265		0.00	0.000	0.001	0.2770	0.1419	0.0000	1.45E-07
266		0.00	0.000	0.000	0.2770	0.1419	0.0000	1.45E-07
267	*	0.18	0.000	0.048	0.2790	0.1418	0.0000	1.45E-07
268	*	0.07	0.000	0.069	0.2809	0.1418	0.0000	1.45E-07
269		0.10	0.031	0.000	0.2936	0.1418	0.0000	1.45E-07
270		0.01	0.000	0.061	0.2920	0.1417	0.0000	1.45E-07
271		0.64	0.384	0.116	0.3060	0.1417	0.0000	1.45E-07
272		0.65	0.447	0.085	0.3175	0.1416	0.0000	1.45E-07
273		0.46	0.270	0.078	0.3290	0.1416	0.0000	1.45E-07
274		0.00	0.000	0.037	0.3253	0.1415	0.0000	1.45E-07
275		0.02	0.000	0.071	0.3201	0.1415	0.0000	1.45E-07
276		0.00	0.000	0.098	0.3104	0.1415	0.0000	1.45E-07
277		0.00	0.000	0.136	0.2968	0.1414	0.0000	1.45E-07
278		0.00	0.000	0.059	0.2909	0.1414	0.0000	1.44E-07
279		0.00	0.000	0.119	0.2790	0.1413	0.0000	1.44E-07
280		0.00	0.000	0.018	0.2772	0.1413	0.0000	1.44E-07

281		0.00	0.000	0.002	0.2770	0.1413	0.0000	1.44E-07
282		0.00	0.000	0.000	0.2770	0.1412	0.0000	1.44E-07
283		0.00	0.000	0.003	0.2770	0.1412	0.0000	1.44E-07
284		0.00	0.000	0.000	0.2770	0.1411	0.0000	1.44E-07
285		0.02	0.000	0.016	0.2771	0.1411	0.0000	1.44E-07
286		0.05	0.000	0.029	0.2793	0.1411	0.0000	1.44E-07
287		0.20	0.033	0.045	0.2919	0.1410	0.0000	1.44E-07
288		0.30	0.128	0.057	0.3035	0.1410	0.0000	1.44E-07
289		0.00	0.000	0.009	0.3026	0.1409	0.0000	1.44E-07
290		0.00	0.000	0.014	0.3012	0.1409	0.0000	1.44E-07
291		0.67	0.484	0.054	0.3146	0.1409	0.0000	1.44E-07
292		0.00	0.000	0.094	0.3052	0.1408	0.0000	1.44E-07
293		0.00	0.000	0.073	0.2979	0.1408	0.0000	1.44E-07
294		0.00	0.000	0.084	0.2895	0.1407	0.0000	1.44E-07
295		0.00	0.000	0.027	0.2867	0.1407	0.0000	1.44E-07
296		0.00	0.000	0.046	0.2822	0.1406	0.0000	1.44E-07
297		0.01	0.000	0.031	0.2802	0.1406	0.0000	1.44E-07
298		0.06	0.000	0.061	0.2806	0.1406	0.0000	1.44E-07
299		0.00	0.000	0.005	0.2801	0.1405	0.0000	1.44E-07
300		0.00	0.000	0.010	0.2791	0.1405	0.0000	1.44E-07
301		0.00	0.000	0.005	0.2787	0.1404	0.0000	1.44E-07
302		0.00	0.000	0.005	0.2782	0.1404	0.0000	1.44E-07
303		0.02	0.000	0.018	0.2782	0.1404	0.0000	1.44E-07
304		0.00	0.000	0.002	0.2780	0.1403	0.0000	1.43E-07
305	*	0.00	0.000	0.004	0.2776	0.1403	0.0000	1.43E-07
306	*	0.04	0.000	0.048	0.2773	0.1402	0.0000	1.43E-07
307		0.00	0.000	0.002	0.2771	0.1402	0.0000	1.43E-07
308	*	0.00	0.000	0.000	0.2770	0.1402	0.0000	1.43E-07
309		0.00	0.000	0.000	0.2770	0.1401	0.0000	1.43E-07
310	*	0.00	0.000	0.000	0.2770	0.1401	0.0000	1.43E-07
311	*	0.16	0.000	0.038	0.2790	0.1400	0.0000	1.43E-07
312	*	0.00	0.000	0.028	0.2809	0.1400	0.0000	1.43E-07

313		0.00	0.000	0.064	0.2805	0.1399	0.0000	1.43E-07
314	*	0.00	0.000	0.007	0.2798	0.1399	0.0000	1.43E-07
315		0.00	0.000	0.012	0.2791	0.1399	0.0000	1.43E-07
316	*	0.04	0.000	0.036	0.2796	0.1398	0.0000	1.43E-07
317	*	0.21	0.000	0.040	0.2815	0.1398	0.0000	1.43E-07
318		0.23	0.190	0.070	0.2943	0.1398	0.0000	1.43E-07
319		0.43	0.263	0.050	0.3059	0.1397	0.0000	1.43E-07
320		0.09	0.000	0.100	0.3046	0.1397	0.0000	1.43E-07
321		0.00	0.000	0.074	0.2973	0.1396	0.0000	1.43E-07
322		0.11	0.000	0.089	0.2990	0.1396	0.0000	1.43E-07
323		0.00	0.000	0.029	0.2962	0.1396	0.0000	1.43E-07
324		0.00	0.000	0.034	0.2927	0.1395	0.0000	1.43E-07
325		0.00	0.000	0.024	0.2903	0.1395	0.0000	1.43E-07
326		0.00	0.000	0.021	0.2882	0.1394	0.0000	1.43E-07
327		0.00	0.000	0.019	0.2864	0.1394	0.0000	1.43E-07
328		0.00	0.000	0.017	0.2847	0.1394	0.0000	1.43E-07
329		0.00	0.000	0.014	0.2832	0.1393	0.0000	1.43E-07
330		0.00	0.000	0.016	0.2816	0.1393	0.0000	1.43E-07
331		0.00	0.000	0.017	0.2799	0.1392	0.0000	1.42E-07
332		0.00	0.000	0.018	0.2780	0.1392	0.0000	1.42E-07
333		0.00	0.000	0.009	0.2771	0.1392	0.0000	1.42E-07
334		0.00	0.000	0.001	0.2770	0.1391	0.0000	1.42E-07
335		0.00	0.000	0.000	0.2770	0.1391	0.0000	1.42E-07
336	*	0.00	0.000	0.000	0.2770	0.1390	0.0000	1.42E-07
337	*	0.01	0.000	0.012	0.2770	0.1390	0.0000	1.42E-07
338	*	0.00	0.000	0.000	0.2770	0.1389	0.0000	1.42E-07
339	*	0.00	0.000	0.000	0.2770	0.1389	0.0000	1.42E-07
340	*	0.00	0.000	0.000	0.2770	0.1389	0.0000	1.42E-07
341	*	0.07	0.000	0.014	0.2790	0.1388	0.0000	1.42E-07
342	*	0.05	0.000	0.000	0.2809	0.1388	0.0000	1.42E-07
343	*	0.03	0.000	0.000	0.2829	0.1387	0.0000	1.42E-07
344	*	0.00	0.000	0.039	0.2849	0.1387	0.0000	1.42E-07

345	*	0.00	0.000	0.019	0.2843	0.1387	0.0000	1.42E-07
346	*	0.06	0.000	0.036	0.2863	0.1386	0.0000	1.42E-07
347	*	0.00	0.000	0.000	0.2863	0.1386	0.0000	1.42E-07
348	*	0.00	0.000	0.000	0.2863	0.1385	0.0000	1.42E-07
349	*	0.00	0.000	0.004	0.2863	0.1385	0.0000	1.42E-07
350	*	0.06	0.000	0.008	0.2882	0.1385	0.0000	1.42E-07
351	*	0.00	0.000	0.014	0.2902	0.1384	0.0000	1.42E-07
352	*	0.00	0.000	0.000	0.2902	0.1384	0.0000	1.42E-07
353		0.00	0.000	0.007	0.2895	0.1383	0.0000	1.42E-07
354		0.14	0.000	0.042	0.2997	0.1383	0.0000	1.42E-07
355		0.74	0.569	0.049	0.3123	0.1383	0.0000	1.42E-07
356		0.00	0.000	0.027	0.3096	0.1382	0.0000	1.42E-07
357		0.00	0.000	0.016	0.3080	0.1382	0.0000	1.41E-07
358	*	0.00	0.000	0.000	0.3080	0.1381	0.0000	1.41E-07
359		0.06	0.000	0.042	0.3098	0.1381	0.0000	1.41E-07
360		0.01	0.000	0.045	0.3067	0.1381	0.0000	1.41E-07
361		0.00	0.000	0.030	0.3036	0.1380	0.0000	1.41E-07
362		0.00	0.000	0.033	0.3003	0.1380	0.0000	1.41E-07
363		0.00	0.000	0.041	0.2962	0.1379	0.0000	1.41E-07
364		0.00	0.000	0.034	0.2928	0.1379	0.0000	1.41E-07
365		0.00	0.000	0.029	0.2899	0.1379	0.0000	1.41E-07

* = Frozen (air or soil)

Annual Totals for Year 26			
	inches	cubic feet	percent
Precipitation	41.89	152,056.3	100.00
Runoff	25.954	94,212.9	61.96
Evapotranspiration	16.266	59,043.9	38.83
Recirculation into Layer 1	0.0060	21.8	0.01
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0060	21.8	0.01
Percolation/Leakage through Layer 5	0.000054	0.1964	0.00
Average Head on Top of Layer 4	0.1454	---	---
Change in Water Storage	-0.3307	-1,200.6	-0.79
Soil Water at Start of Year	1,406.9686	5,107,296.1	3358.82
Soil Water at End of Year	1,406.6379	5,106,095.5	3358.03
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0060	-21.9	-0.01

Daily Output for Year 27

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.18	0.000	0.044	0.2919	0.1378	0.0000	1.41E-07
2			0.00	0.000	0.089	0.2942	0.1378	0.0000	1.41E-07
3			0.00	0.000	0.026	0.2917	0.1377	0.0000	1.41E-07
4			0.00	0.000	0.020	0.2896	0.1377	0.0000	1.41E-07
5	*		0.00	0.000	0.020	0.2877	0.1377	0.0000	1.41E-07
6	*		0.00	0.000	0.017	0.2860	0.1376	0.0000	1.41E-07
7	*		0.00	0.000	0.000	0.2860	0.1376	0.0000	1.41E-07
8	*		0.00	0.000	0.000	0.2860	0.1375	0.0000	1.41E-07
9	*		0.00	0.000	0.016	0.2845	0.1375	0.0000	1.41E-07
10			0.00	0.000	0.018	0.2827	0.1375	0.0000	1.41E-07
11			0.00	0.000	0.013	0.2814	0.1374	0.0000	1.41E-07
12			0.00	0.000	0.014	0.2800	0.1374	0.0000	1.41E-07
13			0.00	0.000	0.015	0.2785	0.1373	0.0000	1.41E-07
14			0.05	0.000	0.039	0.2792	0.1373	0.0000	1.41E-07
15	*		0.00	0.000	0.000	0.2792	0.1372	0.0000	1.41E-07
16	*		0.00	0.000	0.000	0.2792	0.1372	0.0000	1.41E-07
17	*		0.00	0.000	0.000	0.2792	0.1372	0.0000	1.41E-07
18	*		0.00	0.000	0.000	0.2792	0.1371	0.0000	1.41E-07
19	*		0.00	0.000	0.000	0.2792	0.1371	0.0000	1.40E-07
20			0.00	0.000	0.006	0.2786	0.1370	0.0000	1.40E-07
21			0.00	0.000	0.003	0.2783	0.1370	0.0000	1.40E-07
22	*		0.00	0.000	0.003	0.2780	0.1370	0.0000	1.40E-07
23			0.03	0.000	0.023	0.2788	0.1369	0.0000	1.40E-07
24			0.47	0.280	0.049	0.2933	0.1369	0.0000	1.40E-07

25	*		0.31	0.000	0.022	0.2953	0.1368	0.0000	1.40E-07
26	*		0.24	0.000	0.023	0.2973	0.1368	0.0000	1.40E-07
27	*		0.00	0.000	0.040	0.2992	0.1368	0.0000	1.40E-07
28	*	*	0.00	0.000	0.018	0.2992	0.1367	0.0000	1.40E-07
29	*	*	0.00	0.000	0.035	0.2992	0.1367	0.0000	1.40E-07
30	*	*	0.00	0.000	0.019	0.2992	0.1366	0.0000	1.40E-07
31		*	0.00	0.295	0.031	0.3004	0.1366	0.0000	1.40E-07
32		*	0.00	0.000	0.000	0.3004	0.1366	0.0000	1.40E-07
33			0.00	0.000	0.014	0.2990	0.1365	0.0000	1.40E-07
34	*		0.00	0.000	0.000	0.2990	0.1365	0.0000	1.40E-07
35	*	*	0.29	0.000	0.038	0.2990	0.1364	0.0000	1.40E-07
36	*	*	0.14	0.000	0.019	0.2990	0.1364	0.0000	1.40E-07
37	*	*	0.76	0.000	0.022	0.2990	0.1364	0.0000	1.40E-07
38	*	*	0.00	0.000	0.012	0.2990	0.1363	0.0000	1.40E-07
39	*	*	0.00	0.000	0.026	0.2990	0.1363	0.0000	1.40E-07
40	*	*	0.00	0.000	0.035	0.2990	0.1362	0.0000	1.40E-07
41	*	*	0.00	0.000	0.000	0.2990	0.1362	0.0000	1.40E-07
42	*	*	0.24	0.000	0.000	0.2990	0.1362	0.0000	1.40E-07
43	*	*	0.01	0.000	0.000	0.2990	0.1361	0.0000	1.40E-07
44	*	*	0.24	0.000	0.000	0.2990	0.1361	0.0000	1.40E-07
45		*	0.01	1.520	0.000	0.3006	0.1360	0.0000	1.39E-07
46		*	0.00	0.000	0.000	0.3006	0.1360	0.0000	1.39E-07
47			0.00	0.000	0.059	0.2947	0.1360	0.0000	1.39E-07
48			0.00	0.000	0.035	0.2912	0.1360	0.0000	1.39E-07
49	*		0.00	0.000	0.000	0.2912	0.1359	0.0000	1.39E-07
50	*	*	0.00	0.000	0.000	0.2912	0.1359	0.0000	1.39E-07
51		*	0.00	0.000	0.000	0.2912	0.1358	0.0000	1.39E-07
52		*	0.00	0.000	0.000	0.2912	0.1358	0.0000	1.39E-07
53			0.00	0.000	0.025	0.2887	0.1358	0.0000	1.39E-07
54			0.00	0.000	0.075	0.2812	0.1357	0.0000	1.39E-07
55			0.00	0.000	0.031	0.2781	0.1357	0.0000	1.39E-07
56			0.64	0.353	0.144	0.2925	0.1357	0.0000	1.39E-07

57		0.26	0.087	0.093	0.3000	0.1356	0.0000	1.39E-07
58		0.01	0.000	0.037	0.2976	0.1356	0.0000	1.39E-07
59		0.13	0.000	0.050	0.3059	0.1355	0.0000	1.39E-07
60	*	0.01	0.000	0.009	0.3059	0.1355	0.0000	1.39E-07
61	*	0.06	0.000	0.035	0.3078	0.1355	0.0000	1.39E-07
62		0.47	0.256	0.095	0.3206	0.1354	0.0000	1.39E-07
63		0.00	0.000	0.020	0.3186	0.1354	0.0000	1.39E-07
64		0.07	0.000	0.051	0.3203	0.1353	0.0000	1.39E-07
65		0.48	0.258	0.093	0.3328	0.1353	0.0000	1.39E-07
66		0.00	0.000	0.056	0.3273	0.1353	0.0000	1.39E-07
67		0.55	0.356	0.062	0.3407	0.1352	0.0000	1.39E-07
68		0.03	0.000	0.046	0.3388	0.1352	0.0000	1.39E-07
69		0.06	0.000	0.081	0.3369	0.1352	0.0000	1.39E-07
70		0.00	0.000	0.024	0.3345	0.1351	0.0000	1.39E-07
71		0.00	0.000	0.074	0.3271	0.1351	0.0000	1.39E-07
72		0.01	0.000	0.039	0.3245	0.1351	0.0000	1.39E-07
73		0.01	0.000	0.041	0.3214	0.1350	0.0000	1.39E-07
74		0.10	0.000	0.082	0.3232	0.1350	0.0000	1.39E-07
75		0.28	0.100	0.162	0.3249	0.1349	0.0000	1.38E-07
76		0.00	0.000	0.111	0.3138	0.1349	0.0000	1.38E-07
77		0.00	0.000	0.042	0.3096	0.1349	0.0000	1.38E-07
78		0.00	0.000	0.064	0.3032	0.1348	0.0000	1.38E-07
79		2.15	1.924	0.081	0.3182	0.1348	0.0000	1.38E-07
80		0.00	0.000	0.033	0.3149	0.1348	0.0000	1.38E-07
81		0.00	0.000	0.093	0.3056	0.1347	0.0000	1.38E-07
82		0.12	0.000	0.088	0.3090	0.1347	0.0000	1.38E-07
83		0.13	0.000	0.122	0.3098	0.1346	0.0000	1.38E-07
84	*	0.00	0.000	0.054	0.3043	0.1346	0.0000	1.38E-07
85		0.39	0.150	0.145	0.3137	0.1346	0.0000	1.38E-07
86		1.20	0.949	0.140	0.3253	0.1345	0.0000	1.38E-07
87		0.00	0.000	0.087	0.3166	0.1345	0.0000	1.38E-07
88		0.00	0.000	0.147	0.3019	0.1344	0.0000	1.38E-07

89		0.00	0.000	0.059	0.2961	0.1344	0.0000	1.38E-07
90	*	0.00	0.000	0.062	0.2901	0.1344	0.0000	1.38E-07
91	*	0.00	0.000	0.001	0.2901	0.1343	0.0000	1.38E-07
92	*	0.00	0.000	0.000	0.2901	0.1343	0.0000	1.38E-07
93		0.33	0.133	0.146	0.2952	0.1342	0.0000	1.38E-07
94		0.00	0.000	0.034	0.2917	0.1342	0.0000	1.38E-07
95		0.29	0.102	0.080	0.3024	0.1342	0.0000	1.38E-07
96		0.00	0.000	0.059	0.2965	0.1341	0.0000	1.38E-07
97		0.00	0.000	0.073	0.2891	0.1341	0.0000	1.38E-07
98		0.00	0.000	0.064	0.2827	0.1340	0.0000	1.38E-07
99		0.00	0.000	0.040	0.2788	0.1340	0.0000	1.38E-07
100		0.22	0.040	0.093	0.2872	0.1340	0.0000	1.38E-07
101		0.00	0.000	0.037	0.2836	0.1339	0.0000	1.38E-07
102		0.00	0.000	0.049	0.2787	0.1339	0.0000	1.37E-07
103		0.02	0.000	0.038	0.2773	0.1338	0.0000	1.37E-07
104		0.00	0.000	0.002	0.2771	0.1338	0.0000	1.37E-07
105		0.93	0.689	0.077	0.2933	0.1338	0.0000	1.37E-07
106		0.00	0.000	0.024	0.2909	0.1337	0.0000	1.37E-07
107		0.00	0.000	0.067	0.2842	0.1337	0.0000	1.37E-07
108		0.00	0.000	0.039	0.2802	0.1337	0.0000	1.37E-07
109		0.18	0.003	0.089	0.2890	0.1336	0.0000	1.37E-07
110	*	0.26	0.000	0.040	0.2909	0.1336	0.0000	1.37E-07
111		0.00	0.003	0.123	0.2987	0.1335	0.0000	1.37E-07
112		0.03	0.000	0.041	0.2978	0.1335	0.0000	1.37E-07
113	*	0.04	0.000	0.096	0.2926	0.1335	0.0000	1.37E-07
114		0.02	0.000	0.051	0.2899	0.1334	0.0000	1.37E-07
115		0.12	0.000	0.098	0.2925	0.1334	0.0000	1.37E-07
116		0.41	0.185	0.089	0.3056	0.1333	0.0000	1.37E-07
117		0.22	0.054	0.122	0.3100	0.1333	0.0000	1.37E-07
118		0.00	0.000	0.057	0.3047	0.1333	0.0000	1.37E-07
119		0.01	0.000	0.158	0.2896	0.1333	0.0000	1.37E-07
120		0.00	0.000	0.069	0.2827	0.1333	0.0000	1.37E-07

121	0.28	0.104	0.086	0.2914	0.1333	0.0000	1.37E-07
122	0.06	0.000	0.067	0.2904	0.1332	0.0000	1.37E-07
123	0.08	0.000	0.056	0.2926	0.1332	0.0000	1.37E-07
124	0.00	0.000	0.019	0.2907	0.1331	0.0000	1.37E-07
125	0.00	0.000	0.017	0.2891	0.1331	0.0000	1.37E-07
126	0.00	0.000	0.020	0.2871	0.1331	0.0000	1.37E-07
127	0.00	0.000	0.018	0.2852	0.1330	0.0000	1.37E-07
128	0.19	0.034	0.052	0.2959	0.1330	0.0000	1.37E-07
129	0.00	0.000	0.069	0.2889	0.1329	0.0000	1.37E-07
130	0.00	0.000	0.016	0.2873	0.1329	0.0000	1.37E-07
131	0.00	0.000	0.016	0.2857	0.1329	0.0000	1.37E-07
132	0.00	0.000	0.014	0.2843	0.1328	0.0000	1.36E-07
133	0.00	0.000	0.014	0.2828	0.1328	0.0000	1.36E-07
134	0.00	0.000	0.013	0.2815	0.1327	0.0000	1.36E-07
135	0.00	0.000	0.013	0.2803	0.1327	0.0000	1.36E-07
136	0.00	0.000	0.017	0.2786	0.1327	0.0000	1.36E-07
137	0.00	0.000	0.013	0.2772	0.1326	0.0000	1.36E-07
138	0.00	0.000	0.002	0.2771	0.1326	0.0000	1.36E-07
139	0.00	0.000	0.001	0.2770	0.1326	0.0000	1.36E-07
140	0.04	0.000	0.024	0.2783	0.1325	0.0000	1.36E-07
141	0.43	0.229	0.052	0.2930	0.1325	0.0000	1.36E-07
142	0.00	0.000	0.009	0.2921	0.1324	0.0000	1.36E-07
143	0.01	0.000	0.016	0.2910	0.1324	0.0000	1.36E-07
144	0.31	0.120	0.051	0.3047	0.1324	0.0000	1.36E-07
145	0.15	0.006	0.068	0.3121	0.1323	0.0000	1.36E-07
146	0.00	0.000	0.085	0.3036	0.1323	0.0000	1.36E-07
147	0.65	0.320	0.192	0.3173	0.1322	0.0000	1.36E-07
148	0.00	0.000	0.075	0.3099	0.1322	0.0000	1.36E-07
149	0.00	0.000	0.082	0.3016	0.1322	0.0000	1.36E-07
150	0.00	0.000	0.086	0.2930	0.1321	0.0000	1.36E-07
151	0.00	0.000	0.083	0.2848	0.1321	0.0000	1.36E-07
152	0.00	0.000	0.067	0.2781	0.1321	0.0000	1.36E-07

153	0.04	0.000	0.036	0.2782	0.1320	0.0000	1.36E-07
154	0.00	0.000	0.006	0.2776	0.1320	0.0000	1.36E-07
155	0.00	0.000	0.004	0.2772	0.1319	0.0000	1.36E-07
156	0.00	0.000	0.001	0.2771	0.1319	0.0000	1.36E-07
157	0.62	0.392	0.065	0.2931	0.1319	0.0000	1.36E-07
158	0.08	0.000	0.086	0.2930	0.1318	0.0000	1.36E-07
159	0.50	0.316	0.066	0.3052	0.1318	0.0000	1.36E-07
160	0.34	0.153	0.100	0.3138	0.1317	0.0000	1.35E-07
161	0.00	0.000	0.105	0.3033	0.1317	0.0000	1.35E-07
162	0.00	0.000	0.143	0.2890	0.1317	0.0000	1.35E-07
163	0.11	0.000	0.088	0.2912	0.1316	0.0000	1.35E-07
164	0.00	0.000	0.111	0.2801	0.1316	0.0000	1.35E-07
165	0.01	0.000	0.033	0.2779	0.1316	0.0000	1.35E-07
166	0.04	0.000	0.037	0.2786	0.1315	0.0000	1.35E-07
167	1.12	0.895	0.082	0.2931	0.1315	0.0000	1.35E-07
168	0.00	0.000	0.056	0.2874	0.1314	0.0000	1.35E-07
169	0.00	0.000	0.047	0.2828	0.1314	0.0000	1.35E-07
170	0.46	0.177	0.266	0.2844	0.1314	0.0000	1.35E-07
171	0.00	0.000	0.043	0.2801	0.1313	0.0000	1.35E-07
172	0.00	0.000	0.025	0.2776	0.1313	0.0000	1.35E-07
173	0.10	0.000	0.043	0.2831	0.1312	0.0000	1.35E-07
174	0.00	0.000	0.022	0.2808	0.1312	0.0000	1.35E-07
175	0.07	0.000	0.051	0.2825	0.1312	0.0000	1.35E-07
176	0.36	0.158	0.074	0.2955	0.1311	0.0000	1.35E-07
177	0.19	0.018	0.114	0.3008	0.1311	0.0000	1.35E-07
178	0.33	0.127	0.161	0.3047	0.1311	0.0000	1.35E-07
179	0.19	0.015	0.177	0.3045	0.1310	0.0000	1.35E-07
180	0.00	0.000	0.095	0.2950	0.1310	0.0000	1.35E-07
181	0.05	0.000	0.069	0.2932	0.1309	0.0000	1.35E-07
182	0.00	0.000	0.039	0.2893	0.1309	0.0000	1.35E-07
183	0.00	0.000	0.034	0.2859	0.1309	0.0000	1.35E-07
184	0.01	0.000	0.045	0.2827	0.1308	0.0000	1.35E-07

185	0.63	0.406	0.076	0.2970	0.1308	0.0000	1.35E-07
186	0.00	0.000	0.105	0.2864	0.1307	0.0000	1.35E-07
187	0.09	0.000	0.070	0.2883	0.1307	0.0000	1.34E-07
188	0.00	0.000	0.035	0.2848	0.1307	0.0000	1.34E-07
189	0.11	0.000	0.066	0.2892	0.1306	0.0000	1.34E-07
190	0.01	0.000	0.033	0.2872	0.1306	0.0000	1.34E-07
191	0.04	0.000	0.049	0.2868	0.1306	0.0000	1.34E-07
192	0.46	0.274	0.071	0.2982	0.1305	0.0000	1.34E-07
193	0.00	0.000	0.050	0.2932	0.1305	0.0000	1.34E-07
194	0.00	0.000	0.108	0.2824	0.1304	0.0000	1.34E-07
195	0.00	0.000	0.047	0.2776	0.1304	0.0000	1.34E-07
196	0.00	0.000	0.005	0.2771	0.1304	0.0000	1.34E-07
197	0.47	0.246	0.087	0.2905	0.1303	0.0000	1.34E-07
198	0.08	0.000	0.140	0.2843	0.1303	0.0000	1.34E-07
199	0.00	0.000	0.028	0.2815	0.1302	0.0000	1.34E-07
200	0.00	0.000	0.024	0.2791	0.1302	0.0000	1.34E-07
201	0.00	0.000	0.010	0.2782	0.1302	0.0000	1.34E-07
202	0.00	0.000	0.009	0.2773	0.1301	0.0000	1.34E-07
203	0.06	0.000	0.034	0.2797	0.1301	0.0000	1.34E-07
204	0.00	0.000	0.003	0.2794	0.1301	0.0000	1.34E-07
205	0.00	0.000	0.008	0.2786	0.1300	0.0000	1.34E-07
206	0.03	0.000	0.027	0.2789	0.1300	0.0000	1.34E-07
207	0.13	0.000	0.039	0.2880	0.1299	0.0000	1.34E-07
208	0.00	0.000	0.017	0.2863	0.1299	0.0000	1.34E-07
209	0.00	0.000	0.022	0.2841	0.1299	0.0000	1.34E-07
210	0.01	0.000	0.023	0.2824	0.1298	0.0000	1.34E-07
211	0.03	0.000	0.039	0.2815	0.1298	0.0000	1.34E-07
212	0.20	0.030	0.058	0.2922	0.1298	0.0000	1.34E-07
213	0.07	0.000	0.050	0.2939	0.1297	0.0000	1.34E-07
214	0.53	0.346	0.064	0.3060	0.1297	0.0000	1.34E-07
215	0.00	0.000	0.110	0.2951	0.1296	0.0000	1.33E-07
216	0.00	0.000	0.023	0.2928	0.1296	0.0000	1.33E-07

217	0.01	0.000	0.039	0.2903	0.1296	0.0000	1.33E-07
218	0.00	0.000	0.023	0.2881	0.1295	0.0000	1.33E-07
219	0.79	0.578	0.059	0.3031	0.1295	0.0000	1.33E-07
220	0.00	0.000	0.192	0.2839	0.1295	0.0000	1.33E-07
221	0.00	0.000	0.058	0.2781	0.1294	0.0000	1.33E-07
222	0.00	0.000	0.008	0.2773	0.1294	0.0000	1.33E-07
223	0.00	0.000	0.002	0.2770	0.1293	0.0000	1.33E-07
224	0.00	0.000	0.000	0.2770	0.1293	0.0000	1.33E-07
225	0.00	0.000	0.000	0.2770	0.1293	0.0000	1.33E-07
226	0.74	0.503	0.076	0.2930	0.1292	0.0000	1.33E-07
227	0.06	0.000	0.067	0.2922	0.1292	0.0000	1.33E-07
228	0.00	0.000	0.034	0.2888	0.1291	0.0000	1.33E-07
229	0.00	0.000	0.029	0.2859	0.1291	0.0000	1.33E-07
230	0.00	0.000	0.029	0.2830	0.1291	0.0000	1.33E-07
231	0.00	0.000	0.023	0.2807	0.1290	0.0000	1.33E-07
232	0.00	0.000	0.026	0.2781	0.1290	0.0000	1.33E-07
233	0.00	0.000	0.010	0.2771	0.1290	0.0000	1.33E-07
234	0.00	0.000	0.001	0.2770	0.1289	0.0000	1.33E-07
235	0.00	0.000	0.000	0.2770	0.1289	0.0000	1.33E-07
236	0.00	0.000	0.000	0.2770	0.1288	0.0000	1.33E-07
237	0.00	0.000	0.000	0.2770	0.1288	0.0000	1.33E-07
238	0.00	0.000	0.000	0.2770	0.1288	0.0000	1.33E-07
239	0.00	0.000	0.000	0.2770	0.1287	0.0000	1.33E-07
240	0.00	0.000	0.000	0.2770	0.1287	0.0000	1.33E-07
241	0.00	0.000	0.000	0.2770	0.1287	0.0000	1.33E-07
242	0.00	0.000	0.000	0.2770	0.1286	0.0000	1.33E-07
243	0.00	0.000	0.000	0.2770	0.1286	0.0000	1.33E-07
244	0.00	0.000	0.000	0.2770	0.1286	0.0000	1.32E-07
245	0.71	0.496	0.058	0.2928	0.1285	0.0000	1.32E-07
246	0.00	0.000	0.041	0.2887	0.1285	0.0000	1.32E-07
247	0.00	0.000	0.019	0.2867	0.1284	0.0000	1.32E-07
248	1.38	1.181	0.065	0.3005	0.1284	0.0000	1.32E-07

249	0.00	0.000	0.045	0.2959	0.1284	0.0000	1.32E-07
250	0.00	0.000	0.071	0.2888	0.1283	0.0000	1.32E-07
251	0.00	0.000	0.088	0.2800	0.1283	0.0000	1.32E-07
252	0.00	0.000	0.025	0.2775	0.1283	0.0000	1.32E-07
253	0.00	0.000	0.004	0.2771	0.1282	0.0000	1.32E-07
254	0.43	0.174	0.174	0.2856	0.1282	0.0000	1.32E-07
255	0.10	0.000	0.091	0.2861	0.1281	0.0000	1.32E-07
256	0.00	0.000	0.073	0.2790	0.1281	0.0000	1.32E-07
257	1.27	0.945	0.178	0.2942	0.1281	0.0000	1.32E-07
258	0.01	0.000	0.103	0.2853	0.1280	0.0000	1.32E-07
259	0.00	0.000	0.069	0.2784	0.1280	0.0000	1.32E-07
260	0.04	0.000	0.039	0.2782	0.1280	0.0000	1.32E-07
261	0.00	0.000	0.006	0.2776	0.1279	0.0000	1.32E-07
262	0.00	0.000	0.005	0.2771	0.1279	0.0000	1.32E-07
263	0.00	0.000	0.001	0.2770	0.1278	0.0000	1.32E-07
264	0.00	0.000	0.000	0.2770	0.1278	0.0000	1.32E-07
265	0.07	0.000	0.034	0.2809	0.1278	0.0000	1.32E-07
266	0.00	0.000	0.003	0.2807	0.1277	0.0000	1.32E-07
267	0.00	0.000	0.012	0.2795	0.1277	0.0000	1.32E-07
268	0.00	0.000	0.007	0.2787	0.1277	0.0000	1.32E-07
269	0.00	0.000	0.006	0.2781	0.1276	0.0000	1.32E-07
270	0.00	0.000	0.005	0.2777	0.1276	0.0000	1.32E-07
271	0.00	0.000	0.004	0.2772	0.1275	0.0000	1.32E-07
272	0.00	0.000	0.002	0.2771	0.1275	0.0000	1.31E-07
273	0.25	0.075	0.047	0.2897	0.1275	0.0000	1.31E-07
274	0.00	0.000	0.010	0.2887	0.1274	0.0000	1.31E-07
275	0.00	0.000	0.014	0.2873	0.1274	0.0000	1.31E-07
276	0.00	0.000	0.014	0.2859	0.1274	0.0000	1.31E-07
277	0.00	0.000	0.013	0.2847	0.1273	0.0000	1.31E-07
278	0.00	0.000	0.011	0.2835	0.1273	0.0000	1.31E-07
279	0.00	0.000	0.011	0.2824	0.1272	0.0000	1.31E-07
280	0.00	0.000	0.011	0.2813	0.1272	0.0000	1.31E-07

281	*	0.00	0.000	0.010	0.2803	0.1272	0.0000	1.31E-07
282		0.00	0.000	0.010	0.2793	0.1271	0.0000	1.31E-07
283		0.00	0.000	0.010	0.2784	0.1271	0.0000	1.31E-07
284	*	0.00	0.000	0.000	0.2784	0.1271	0.0000	1.31E-07
285	*	0.11	0.000	0.047	0.2804	0.1270	0.0000	1.31E-07
286	*	0.05	0.000	0.038	0.2823	0.1270	0.0000	1.31E-07
287		0.40	0.258	0.055	0.2950	0.1270	0.0000	1.31E-07
288		0.17	0.009	0.064	0.3043	0.1269	0.0000	1.31E-07
289		0.84	0.638	0.087	0.3158	0.1269	0.0000	1.31E-07
290		0.00	0.000	0.127	0.3031	0.1268	0.0000	1.31E-07
291		0.00	0.000	0.044	0.2989	0.1268	0.0000	1.31E-07
292		0.00	0.000	0.080	0.2909	0.1268	0.0000	1.31E-07
293		0.00	0.000	0.119	0.2790	0.1268	0.0000	1.31E-07
294		0.00	0.000	0.017	0.2773	0.1268	0.0000	1.31E-07
295		0.00	0.000	0.002	0.2771	0.1268	0.0000	1.31E-07
296		0.00	0.000	0.001	0.2770	0.1267	0.0000	1.31E-07
297		0.00	0.000	0.000	0.2770	0.1267	0.0000	1.31E-07
298		0.00	0.000	0.000	0.2770	0.1267	0.0000	1.31E-07
299		0.00	0.000	0.000	0.2770	0.1266	0.0000	1.31E-07
300		0.00	0.000	0.000	0.2770	0.1266	0.0000	1.31E-07
301		0.00	0.000	0.000	0.2770	0.1266	0.0000	1.31E-07
302		0.00	0.000	0.000	0.2770	0.1265	0.0000	1.31E-07
303		0.00	0.000	0.000	0.2770	0.1265	0.0000	1.31E-07
304		0.01	0.000	0.008	0.2770	0.1264	0.0000	1.30E-07
305		0.00	0.000	0.000	0.2770	0.1264	0.0000	1.30E-07
306		0.00	0.000	0.000	0.2770	0.1264	0.0000	1.30E-07
307		0.00	0.000	0.000	0.2770	0.1263	0.0000	1.30E-07
308		0.00	0.000	0.000	0.2770	0.1263	0.0000	1.30E-07
309		0.00	0.000	0.000	0.2770	0.1263	0.0000	1.30E-07
310		0.00	0.000	0.000	0.2770	0.1262	0.0000	1.30E-07
311		0.00	0.000	0.000	0.2770	0.1262	0.0000	1.30E-07
312		0.00	0.000	0.000	0.2770	0.1262	0.0000	1.30E-07

313		0.00	0.000	0.000	0.2770	0.1261	0.0000	1.30E-07
314		0.00	0.000	0.000	0.2770	0.1261	0.0000	1.30E-07
315		0.00	0.000	0.000	0.2770	0.1260	0.0000	1.30E-07
316		0.11	0.000	0.037	0.2840	0.1260	0.0000	1.30E-07
317		0.00	0.000	0.007	0.2833	0.1260	0.0000	1.30E-07
318		0.00	0.000	0.007	0.2826	0.1259	0.0000	1.30E-07
319		0.00	0.000	0.008	0.2818	0.1259	0.0000	1.30E-07
320	*	0.00	0.000	0.008	0.2810	0.1259	0.0000	1.30E-07
321		0.00	0.000	0.008	0.2802	0.1258	0.0000	1.30E-07
322		0.00	0.000	0.008	0.2794	0.1258	0.0000	1.30E-07
323		0.00	0.000	0.008	0.2786	0.1258	0.0000	1.30E-07
324		2.16	1.963	0.048	0.2940	0.1257	0.0000	1.30E-07
325		0.00	0.000	0.008	0.2932	0.1257	0.0000	1.30E-07
326		0.00	0.000	0.008	0.2924	0.1256	0.0000	1.30E-07
327	*	0.00	0.000	0.000	0.2924	0.1256	0.0000	1.30E-07
328	*	0.00	0.000	0.008	0.2916	0.1256	0.0000	1.30E-07
329		0.02	0.000	0.024	0.2914	0.1255	0.0000	1.30E-07
330		0.00	0.000	0.007	0.2907	0.1255	0.0000	1.30E-07
331	*	0.00	0.000	0.000	0.2907	0.1255	0.0000	1.30E-07
332	*	0.50	0.000	0.029	0.2927	0.1254	0.0000	1.30E-07
333		0.00	0.225	0.019	0.3054	0.1254	0.0000	1.30E-07
334		0.00	0.000	0.103	0.3027	0.1254	0.0000	1.29E-07
335		0.00	0.000	0.030	0.2998	0.1253	0.0000	1.29E-07
336		0.00	0.000	0.014	0.2985	0.1253	0.0000	1.29E-07
337	*	0.69	0.000	0.029	0.3005	0.1253	0.0000	1.29E-07
338		0.00	0.516	0.001	0.3132	0.1252	0.0000	1.29E-07
339		0.02	0.000	0.038	0.3113	0.1252	0.0000	1.29E-07
340		0.16	0.005	0.058	0.3208	0.1251	0.0000	1.29E-07
341		0.00	0.000	0.071	0.3136	0.1251	0.0000	1.29E-07
342		0.00	0.000	0.097	0.3045	0.1251	0.0000	1.29E-07
343		0.00	0.000	0.047	0.3002	0.1250	0.0000	1.29E-07
344		0.00	0.000	0.067	0.2935	0.1254	0.0000	1.30E-07

345		0.82	0.575	0.080	0.3098	0.1256	0.0000	1.30E-07
346		0.00	0.000	0.033	0.3065	0.1256	0.0000	1.30E-07
347		0.00	0.000	0.058	0.3007	0.1255	0.0000	1.30E-07
348		0.00	0.000	0.070	0.2937	0.1255	0.0000	1.30E-07
349		0.00	0.000	0.059	0.2879	0.1254	0.0000	1.30E-07
350		0.00	0.000	0.093	0.2786	0.1254	0.0000	1.30E-07
351		0.02	0.000	0.029	0.2774	0.1254	0.0000	1.29E-07
352		0.00	0.000	0.003	0.2771	0.1253	0.0000	1.29E-07
353		0.00	0.000	0.001	0.2770	0.1253	0.0000	1.29E-07
354		0.00	0.000	0.000	0.2770	0.1253	0.0000	1.29E-07
355		0.00	0.000	0.000	0.2770	0.1252	0.0000	1.29E-07
356		0.00	0.000	0.000	0.2770	0.1252	0.0000	1.29E-07
357		0.00	0.000	0.000	0.2770	0.1252	0.0000	1.29E-07
358		1.20	0.982	0.055	0.2933	0.1251	0.0000	1.29E-07
359	*	0.00	0.000	0.006	0.2927	0.1251	0.0000	1.29E-07
360		0.00	0.000	0.017	0.2911	0.1250	0.0000	1.29E-07
361		0.00	0.000	0.017	0.2894	0.1250	0.0000	1.29E-07
362		0.00	0.000	0.010	0.2883	0.1250	0.0000	1.29E-07
363	*	0.00	0.000	0.000	0.2883	0.1249	0.0000	1.29E-07
364	*	0.01	0.000	0.006	0.2883	0.1249	0.0000	1.29E-07
365	*	0.00	0.000	0.000	0.2883	0.1249	0.0000	1.29E-07

* = Frozen (air or soil)

Annual Totals for Year 27			
	inches	cubic feet	percent
Precipitation	36.13	131,160.8	100.00
Runoff	21.224	77,041.9	58.74
Evapotranspiration	14.929	54,190.9	41.32
Recirculation into Layer 1	0.0054	19.7	0.01
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0054	19.7	0.01
Percolation/Leakage through Layer 5	0.000049	0.1785	0.00
Average Head on Top of Layer 4	0.1309	---	---
Change in Water Storage	-0.0199	-72.2	-0.06
Soil Water at Start of Year	1,406.6379	5,106,095.5	3893.00
Soil Water at End of Year	1,406.6180	5,106,023.4	3892.95
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0054	-19.7	-0.02

Daily Output for Year 28

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.000	0.2883	0.1248	0.0000	1.29E-07
2	*		0.00	0.000	0.000	0.2883	0.1248	0.0000	1.29E-07
3	*		0.00	0.000	0.000	0.2883	0.1248	0.0000	1.29E-07
4			0.00	0.000	0.020	0.2863	0.1247	0.0000	1.29E-07
5			0.00	0.000	0.018	0.2845	0.1247	0.0000	1.29E-07
6	*		0.00	0.000	0.000	0.2845	0.1246	0.0000	1.29E-07
7			0.00	0.000	0.014	0.2831	0.1246	0.0000	1.29E-07
8			0.00	0.000	0.027	0.2804	0.1246	0.0000	1.29E-07
9			0.00	0.000	0.024	0.2780	0.1245	0.0000	1.29E-07
10	*		0.00	0.000	0.008	0.2772	0.1245	0.0000	1.29E-07
11	*		0.27	0.000	0.035	0.2792	0.1245	0.0000	1.29E-07
12			0.00	0.006	0.043	0.2913	0.1244	0.0000	1.29E-07
13			0.10	0.000	0.102	0.2957	0.1244	0.0000	1.29E-07
14			0.00	0.000	0.018	0.2939	0.1244	0.0000	1.29E-07
15			0.00	0.000	0.025	0.2915	0.1243	0.0000	1.28E-07
16			0.00	0.000	0.038	0.2876	0.1243	0.0000	1.28E-07
17			0.00	0.000	0.019	0.2858	0.1242	0.0000	1.28E-07
18			0.00	0.000	0.022	0.2835	0.1242	0.0000	1.28E-07
19	*		0.39	0.000	0.031	0.2855	0.1242	0.0000	1.28E-07
20	*		0.07	0.000	0.032	0.2875	0.1241	0.0000	1.28E-07
21			0.00	0.171	0.063	0.3002	0.1241	0.0000	1.28E-07
22			0.00	0.000	0.030	0.2972	0.1241	0.0000	1.28E-07
23			0.00	0.000	0.024	0.2948	0.1240	0.0000	1.28E-07
24			0.00	0.000	0.027	0.2921	0.1240	0.0000	1.28E-07

25		0.00	0.000	0.044	0.2877	0.1240	0.0000	1.28E-07
26		0.06	0.000	0.064	0.2870	0.1239	0.0000	1.28E-07
27		0.00	0.000	0.032	0.2838	0.1239	0.0000	1.28E-07
28		0.02	0.000	0.047	0.2813	0.1238	0.0000	1.28E-07
29	*	0.04	0.000	0.032	0.2817	0.1238	0.0000	1.28E-07
30	*	0.00	0.000	0.000	0.2817	0.1238	0.0000	1.28E-07
31		0.00	0.000	0.016	0.2801	0.1237	0.0000	1.28E-07
32	*	0.00	0.000	0.000	0.2801	0.1237	0.0000	1.28E-07
33	*	0.00	0.000	0.000	0.2801	0.1237	0.0000	1.28E-07
34	*	0.16	0.000	0.038	0.2820	0.1236	0.0000	1.28E-07
35	*	0.11	0.000	0.024	0.2840	0.1236	0.0000	1.28E-07
36	*	0.09	0.000	0.030	0.2860	0.1236	0.0000	1.28E-07
37		0.22	0.178	0.000	0.2987	0.1235	0.0000	1.28E-07
38	*	0.03	0.000	0.038	0.3007	0.1235	0.0000	1.28E-07
39		0.00	0.000	0.085	0.3012	0.1235	0.0000	1.28E-07
40		0.00	0.000	0.044	0.2969	0.1234	0.0000	1.28E-07
41		0.00	0.000	0.043	0.2926	0.1234	0.0000	1.28E-07
42		0.00	0.000	0.034	0.2891	0.1233	0.0000	1.28E-07
43	*	0.00	0.000	0.000	0.2891	0.1233	0.0000	1.28E-07
44	*	0.13	0.000	0.027	0.2911	0.1233	0.0000	1.28E-07
45	*	0.00	0.000	0.053	0.2931	0.1232	0.0000	1.27E-07
46	*	0.00	0.000	0.012	0.2931	0.1232	0.0000	1.27E-07
47	*	0.00	0.000	0.000	0.2931	0.1232	0.0000	1.27E-07
48		0.00	0.000	0.020	0.2910	0.1232	0.0000	1.27E-07
49	*	0.00	0.000	0.000	0.2910	0.1233	0.0000	1.28E-07
50	*	0.00	0.000	0.000	0.2910	0.1232	0.0000	1.27E-07
51		0.12	0.000	0.078	0.2957	0.1232	0.0000	1.27E-07
52		0.45	0.211	0.106	0.3089	0.1232	0.0000	1.27E-07
53		0.00	0.000	0.084	0.3005	0.1231	0.0000	1.27E-07
54		0.00	0.000	0.058	0.2947	0.1231	0.0000	1.27E-07
55		0.00	0.000	0.014	0.2933	0.1231	0.0000	1.27E-07
56	*	0.00	0.000	0.013	0.2920	0.1230	0.0000	1.27E-07

57		0.00	0.000	0.023	0.2897	0.1230	0.0000	1.27E-07
58		0.00	0.000	0.056	0.2841	0.1230	0.0000	1.27E-07
59		0.45	0.208	0.107	0.2977	0.1229	0.0000	1.27E-07
60		0.00	0.000	0.103	0.2874	0.1229	0.0000	1.27E-07
61		0.00	0.000	0.055	0.2818	0.1228	0.0000	1.27E-07
62		0.00	0.000	0.036	0.2782	0.1228	0.0000	1.27E-07
63		0.00	0.000	0.009	0.2773	0.1228	0.0000	1.27E-07
64		0.00	0.000	0.002	0.2771	0.1227	0.0000	1.27E-07
65		0.25	0.074	0.059	0.2886	0.1227	0.0000	1.27E-07
66		0.00	0.000	0.024	0.2862	0.1227	0.0000	1.27E-07
67	*	0.00	0.000	0.000	0.2862	0.1226	0.0000	1.27E-07
68		0.00	0.000	0.036	0.2826	0.1226	0.0000	1.27E-07
69	*	0.11	0.000	0.035	0.2846	0.1226	0.0000	1.27E-07
70	*	0.04	0.000	0.039	0.2865	0.1225	0.0000	1.27E-07
71		0.00	0.000	0.090	0.2820	0.1225	0.0000	1.27E-07
72		0.00	0.000	0.035	0.2785	0.1225	0.0000	1.27E-07
73		0.02	0.000	0.027	0.2778	0.1224	0.0000	1.27E-07
74		0.07	0.000	0.036	0.2813	0.1224	0.0000	1.27E-07
75	*	0.00	0.000	0.000	0.2813	0.1223	0.0000	1.27E-07
76	*	0.00	0.000	0.015	0.2798	0.1223	0.0000	1.27E-07
77	*	0.00	0.000	0.009	0.2789	0.1224	0.0000	1.27E-07
78	*	0.00	0.000	0.006	0.2783	0.1223	0.0000	1.27E-07
79		0.06	0.000	0.034	0.2812	0.1223	0.0000	1.27E-07
80		0.10	0.000	0.040	0.2868	0.1223	0.0000	1.27E-07
81		0.00	0.000	0.011	0.2857	0.1222	0.0000	1.27E-07
82	*	0.21	0.000	0.095	0.2877	0.1222	0.0000	1.26E-07
83		0.00	0.000	0.104	0.2866	0.1222	0.0000	1.26E-07
84		0.00	0.000	0.010	0.2857	0.1221	0.0000	1.26E-07
85		0.00	0.000	0.012	0.2845	0.1221	0.0000	1.26E-07
86		0.00	0.000	0.012	0.2832	0.1221	0.0000	1.26E-07
87		0.00	0.000	0.012	0.2820	0.1220	0.0000	1.26E-07
88		0.00	0.000	0.012	0.2809	0.1220	0.0000	1.26E-07

89	0.63	0.421	0.053	0.2965	0.1220	0.0000	1.26E-07
90	0.10	0.000	0.093	0.2976	0.1219	0.0000	1.26E-07
91	0.41	0.232	0.053	0.3106	0.1219	0.0000	1.26E-07
92	0.68	0.400	0.232	0.3156	0.1218	0.0000	1.26E-07
93	0.05	0.000	0.075	0.3128	0.1218	0.0000	1.26E-07
94	0.00	0.000	0.042	0.3086	0.1218	0.0000	1.26E-07
95	1.02	0.659	0.222	0.3224	0.1217	0.0000	1.26E-07
96	1.20	0.902	0.217	0.3308	0.1217	0.0000	1.26E-07
97	0.45	0.289	0.079	0.3385	0.1217	0.0000	1.26E-07
98	0.59	0.420	0.089	0.3467	0.1216	0.0000	1.26E-07
99	0.00	0.000	0.112	0.3355	0.1216	0.0000	1.26E-07
100	0.01	0.000	0.055	0.3304	0.1216	0.0000	1.26E-07
101	0.01	0.000	0.071	0.3239	0.1215	0.0000	1.26E-07
102	0.00	0.000	0.121	0.3119	0.1215	0.0000	1.26E-07
103	0.28	0.090	0.237	0.3071	0.1215	0.0000	1.26E-07
104	0.18	0.014	0.202	0.3036	0.1214	0.0000	1.26E-07
105	1.98	1.718	0.147	0.3152	0.1214	0.0000	1.26E-07
106	0.00	0.000	0.181	0.2970	0.1213	0.0000	1.26E-07
107	0.00	0.000	0.073	0.2897	0.1215	0.0000	1.26E-07
108	0.14	0.000	0.074	0.2959	0.1219	0.0000	1.26E-07
109	0.61	0.357	0.118	0.3091	0.1219	0.0000	1.26E-07
110	0.00	0.000	0.067	0.3024	0.1218	0.0000	1.26E-07
111	0.02	0.000	0.067	0.2981	0.1218	0.0000	1.26E-07
112	0.00	0.000	0.104	0.2877	0.1218	0.0000	1.26E-07
113	0.00	0.000	0.062	0.2815	0.1217	0.0000	1.26E-07
114	0.00	0.000	0.036	0.2778	0.1217	0.0000	1.26E-07
115	0.00	0.000	0.006	0.2772	0.1216	0.0000	1.26E-07
116	0.00	0.000	0.002	0.2771	0.1216	0.0000	1.26E-07
117	1.23	0.985	0.079	0.2933	0.1216	0.0000	1.26E-07
118	0.06	0.000	0.059	0.2936	0.1215	0.0000	1.26E-07
119	0.00	0.000	0.089	0.2847	0.1215	0.0000	1.26E-07
120	0.00	0.000	0.060	0.2787	0.1215	0.0000	1.26E-07

121	0.00	0.000	0.013	0.2774	0.1214	0.0000	1.26E-07
122	0.00	0.000	0.003	0.2771	0.1214	0.0000	1.26E-07
123	0.00	0.000	0.001	0.2770	0.1214	0.0000	1.26E-07
124	0.44	0.231	0.072	0.2911	0.1213	0.0000	1.26E-07
125	0.00	0.000	0.098	0.2813	0.1213	0.0000	1.26E-07
126	0.00	0.000	0.020	0.2792	0.1213	0.0000	1.26E-07
127	0.00	0.000	0.019	0.2774	0.1212	0.0000	1.26E-07
128	0.00	0.000	0.003	0.2771	0.1212	0.0000	1.26E-07
129	1.96	1.738	0.062	0.2933	0.1212	0.0000	1.26E-07
130	0.00	0.000	0.090	0.2843	0.1211	0.0000	1.25E-07
131	0.00	0.000	0.062	0.2781	0.1211	0.0000	1.25E-07
132	0.00	0.000	0.008	0.2773	0.1211	0.0000	1.25E-07
133	0.00	0.000	0.002	0.2771	0.1210	0.0000	1.25E-07
134	0.00	0.000	0.001	0.2770	0.1210	0.0000	1.25E-07
135	0.50	0.279	0.073	0.2917	0.1209	0.0000	1.25E-07
136	0.00	0.000	0.013	0.2903	0.1209	0.0000	1.25E-07
137	0.00	0.000	0.020	0.2884	0.1209	0.0000	1.25E-07
138	0.00	0.000	0.019	0.2865	0.1208	0.0000	1.25E-07
139	0.00	0.000	0.018	0.2847	0.1208	0.0000	1.25E-07
140	0.00	0.000	0.016	0.2831	0.1208	0.0000	1.25E-07
141	0.00	0.000	0.016	0.2815	0.1207	0.0000	1.25E-07
142	0.00	0.000	0.015	0.2800	0.1207	0.0000	1.25E-07
143	0.00	0.000	0.012	0.2787	0.1207	0.0000	1.25E-07
144	0.00	0.000	0.014	0.2773	0.1206	0.0000	1.25E-07
145	0.00	0.000	0.003	0.2771	0.1206	0.0000	1.25E-07
146	0.00	0.000	0.000	0.2770	0.1206	0.0000	1.25E-07
147	0.00	0.000	0.000	0.2770	0.1205	0.0000	1.25E-07
148	0.00	0.000	0.000	0.2770	0.1205	0.0000	1.25E-07
149	0.00	0.000	0.000	0.2770	0.1205	0.0000	1.25E-07
150	1.66	1.444	0.053	0.2932	0.1204	0.0000	1.25E-07
151	0.14	0.000	0.063	0.3008	0.1204	0.0000	1.25E-07
152	0.80	0.556	0.110	0.3139	0.1204	0.0000	1.25E-07

153	0.30	0.122	0.238	0.3082	0.1203	0.0000	1.25E-07
154	0.00	0.000	0.052	0.3030	0.1203	0.0000	1.25E-07
155	0.00	0.000	0.174	0.2856	0.1202	0.0000	1.25E-07
156	0.00	0.000	0.049	0.2807	0.1202	0.0000	1.25E-07
157	0.00	0.000	0.035	0.2772	0.1202	0.0000	1.25E-07
158	0.00	0.000	0.002	0.2771	0.1201	0.0000	1.25E-07
159	0.00	0.000	0.001	0.2770	0.1201	0.0000	1.25E-07
160	0.00	0.000	0.000	0.2770	0.1201	0.0000	1.24E-07
161	0.14	0.000	0.040	0.2866	0.1200	0.0000	1.24E-07
162	0.00	0.000	0.016	0.2850	0.1200	0.0000	1.24E-07
163	0.00	0.000	0.021	0.2829	0.1200	0.0000	1.24E-07
164	0.18	0.020	0.058	0.2929	0.1199	0.0000	1.24E-07
165	0.00	0.000	0.015	0.2914	0.1199	0.0000	1.24E-07
166	0.00	0.000	0.020	0.2894	0.1199	0.0000	1.24E-07
167	0.00	0.000	0.020	0.2874	0.1198	0.0000	1.24E-07
168	0.00	0.000	0.019	0.2855	0.1198	0.0000	1.24E-07
169	0.00	0.000	0.017	0.2838	0.1198	0.0000	1.24E-07
170	0.02	0.000	0.029	0.2825	0.1197	0.0000	1.24E-07
171	0.01	0.000	0.025	0.2809	0.1197	0.0000	1.24E-07
172	0.00	0.000	0.016	0.2793	0.1197	0.0000	1.24E-07
173	0.00	0.000	0.016	0.2777	0.1196	0.0000	1.24E-07
174	0.00	0.000	0.006	0.2772	0.1196	0.0000	1.24E-07
175	0.07	0.000	0.034	0.2805	0.1196	0.0000	1.24E-07
176	0.21	0.047	0.045	0.2926	0.1195	0.0000	1.24E-07
177	0.00	0.000	0.009	0.2917	0.1195	0.0000	1.24E-07
178	0.00	0.000	0.014	0.2903	0.1194	0.0000	1.24E-07
179	0.18	0.015	0.053	0.3011	0.1194	0.0000	1.24E-07
180	0.32	0.153	0.058	0.3121	0.1194	0.0000	1.24E-07
181	0.00	0.000	0.093	0.3028	0.1193	0.0000	1.24E-07
182	0.00	0.000	0.015	0.3013	0.1193	0.0000	1.24E-07
183	0.16	0.001	0.050	0.3121	0.1193	0.0000	1.24E-07
184	0.00	0.000	0.073	0.3048	0.1192	0.0000	1.24E-07

185	0.00	0.000	0.016	0.3032	0.1192	0.0000	1.24E-07
186	0.00	0.000	0.015	0.3017	0.1192	0.0000	1.24E-07
187	0.03	0.000	0.034	0.3018	0.1191	0.0000	1.24E-07
188	0.05	0.000	0.042	0.3027	0.1191	0.0000	1.24E-07
189	0.09	0.000	0.047	0.3069	0.1191	0.0000	1.24E-07
190	0.27	0.092	0.176	0.3071	0.1190	0.0000	1.23E-07
191	0.55	0.272	0.257	0.3094	0.1190	0.0000	1.23E-07
192	0.02	0.000	0.175	0.2936	0.1190	0.0000	1.23E-07
193	0.13	0.000	0.136	0.2929	0.1189	0.0000	1.23E-07
194	0.00	0.000	0.054	0.2876	0.1189	0.0000	1.23E-07
195	0.89	0.665	0.082	0.3018	0.1189	0.0000	1.23E-07
196	0.26	0.104	0.085	0.3091	0.1188	0.0000	1.23E-07
197	0.28	0.117	0.077	0.3172	0.1188	0.0000	1.23E-07
198	0.41	0.216	0.093	0.3276	0.1188	0.0000	1.23E-07
199	0.05	0.000	0.073	0.3256	0.1187	0.0000	1.23E-07
200	0.44	0.227	0.188	0.3281	0.1187	0.0000	1.23E-07
201	0.10	0.001	0.237	0.3144	0.1186	0.0000	1.23E-07
202	0.01	0.000	0.179	0.2975	0.1186	0.0000	1.23E-07
203	0.05	0.000	0.187	0.2833	0.1186	0.0000	1.23E-07
204	0.16	0.000	0.089	0.2904	0.1186	0.0000	1.23E-07
205	0.00	0.000	0.061	0.2843	0.1188	0.0000	1.23E-07
206	0.00	0.000	0.042	0.2801	0.1188	0.0000	1.23E-07
207	0.56	0.316	0.100	0.2945	0.1187	0.0000	1.23E-07
208	0.30	0.097	0.168	0.2982	0.1187	0.0000	1.23E-07
209	0.06	0.000	0.073	0.2968	0.1187	0.0000	1.23E-07
210	0.12	0.000	0.138	0.2953	0.1186	0.0000	1.23E-07
211	0.54	0.229	0.208	0.3053	0.1186	0.0000	1.23E-07
212	0.00	0.000	0.096	0.2957	0.1186	0.0000	1.23E-07
213	0.00	0.000	0.118	0.2839	0.1185	0.0000	1.23E-07
214	0.11	0.000	0.102	0.2852	0.1185	0.0000	1.23E-07
215	0.00	0.000	0.042	0.2810	0.1185	0.0000	1.23E-07
216	0.00	0.000	0.025	0.2785	0.1184	0.0000	1.23E-07

217	0.00	0.000	0.008	0.2776	0.1184	0.0000	1.23E-07
218	0.22	0.046	0.054	0.2896	0.1183	0.0000	1.23E-07
219	0.00	0.000	0.018	0.2878	0.1183	0.0000	1.23E-07
220	0.15	0.000	0.063	0.2963	0.1183	0.0000	1.23E-07
221	0.19	0.024	0.053	0.3076	0.1182	0.0000	1.23E-07
222	0.00	0.000	0.135	0.2941	0.1182	0.0000	1.23E-07
223	0.00	0.000	0.024	0.2916	0.1182	0.0000	1.23E-07
224	0.00	0.000	0.020	0.2897	0.1182	0.0000	1.23E-07
225	0.00	0.000	0.018	0.2879	0.1182	0.0000	1.23E-07
226	0.00	0.000	0.022	0.2857	0.1182	0.0000	1.23E-07
227	0.00	0.000	0.024	0.2833	0.1181	0.0000	1.23E-07
228	0.00	0.000	0.026	0.2807	0.1181	0.0000	1.23E-07
229	0.00	0.000	0.031	0.2776	0.1181	0.0000	1.23E-07
230	0.00	0.000	0.005	0.2771	0.1180	0.0000	1.23E-07
231	0.00	0.000	0.001	0.2770	0.1180	0.0000	1.23E-07
232	0.00	0.000	0.000	0.2770	0.1180	0.0000	1.22E-07
233	0.02	0.000	0.019	0.2773	0.1179	0.0000	1.22E-07
234	0.09	0.000	0.036	0.2824	0.1179	0.0000	1.22E-07
235	0.22	0.043	0.050	0.2953	0.1179	0.0000	1.22E-07
236	0.58	0.409	0.058	0.3064	0.1178	0.0000	1.22E-07
237	0.01	0.000	0.055	0.3022	0.1178	0.0000	1.22E-07
238	1.14	0.904	0.087	0.3167	0.1178	0.0000	1.22E-07
239	0.34	0.162	0.140	0.3207	0.1177	0.0000	1.22E-07
240	0.00	0.000	0.039	0.3168	0.1177	0.0000	1.22E-07
241	0.00	0.000	0.038	0.3130	0.1177	0.0000	1.22E-07
242	0.00	0.000	0.097	0.3033	0.1176	0.0000	1.22E-07
243	0.00	0.000	0.039	0.2994	0.1176	0.0000	1.22E-07
244	0.00	0.000	0.095	0.2899	0.1175	0.0000	1.22E-07
245	0.00	0.000	0.097	0.2802	0.1175	0.0000	1.22E-07
246	0.00	0.000	0.029	0.2773	0.1175	0.0000	1.22E-07
247	0.21	0.014	0.101	0.2865	0.1174	0.0000	1.22E-07
248	0.00	0.000	0.051	0.2814	0.1174	0.0000	1.22E-07

249		0.00	0.000	0.037	0.2777	0.1174	0.0000	1.22E-07
250		0.00	0.000	0.005	0.2772	0.1173	0.0000	1.22E-07
251		0.17	0.001	0.049	0.2890	0.1173	0.0000	1.22E-07
252		0.09	0.000	0.057	0.2928	0.1173	0.0000	1.22E-07
253		0.00	0.000	0.024	0.2904	0.1172	0.0000	1.22E-07
254		0.06	0.000	0.053	0.2912	0.1172	0.0000	1.22E-07
255		0.00	0.000	0.019	0.2893	0.1172	0.0000	1.22E-07
256		0.00	0.000	0.015	0.2878	0.1171	0.0000	1.22E-07
257		0.00	0.000	0.018	0.2860	0.1171	0.0000	1.22E-07
258		0.00	0.000	0.018	0.2842	0.1171	0.0000	1.22E-07
259		0.00	0.000	0.017	0.2825	0.1170	0.0000	1.22E-07
260		0.32	0.127	0.059	0.2959	0.1170	0.0000	1.22E-07
261		0.00	0.000	0.014	0.2945	0.1170	0.0000	1.22E-07
262		0.00	0.000	0.014	0.2931	0.1169	0.0000	1.22E-07
263		0.00	0.000	0.013	0.2918	0.1169	0.0000	1.21E-07
264		0.00	0.000	0.013	0.2905	0.1169	0.0000	1.21E-07
265		0.00	0.000	0.013	0.2891	0.1168	0.0000	1.21E-07
266		0.00	0.000	0.013	0.2879	0.1168	0.0000	1.21E-07
267		0.00	0.000	0.011	0.2867	0.1168	0.0000	1.21E-07
268		0.00	0.000	0.011	0.2856	0.1167	0.0000	1.21E-07
269		0.06	0.000	0.042	0.2870	0.1167	0.0000	1.21E-07
270		0.00	0.000	0.012	0.2859	0.1167	0.0000	1.21E-07
271		0.00	0.000	0.013	0.2846	0.1166	0.0000	1.21E-07
272		0.02	0.000	0.030	0.2839	0.1166	0.0000	1.21E-07
273		0.89	0.699	0.053	0.2976	0.1166	0.0000	1.21E-07
274		0.00	0.000	0.056	0.2920	0.1165	0.0000	1.21E-07
275		0.00	0.000	0.027	0.2893	0.1165	0.0000	1.21E-07
276	*	0.00	0.000	0.017	0.2876	0.1165	0.0000	1.21E-07
277		0.00	0.000	0.044	0.2832	0.1164	0.0000	1.21E-07
278		0.00	0.000	0.025	0.2806	0.1164	0.0000	1.21E-07
279		0.00	0.000	0.028	0.2779	0.1164	0.0000	1.21E-07
280		0.00	0.000	0.007	0.2772	0.1163	0.0000	1.21E-07

281		0.00	0.000	0.002	0.2771	0.1163	0.0000	1.21E-07
282		0.00	0.000	0.000	0.2770	0.1163	0.0000	1.21E-07
283		0.00	0.000	0.000	0.2770	0.1162	0.0000	1.21E-07
284		0.00	0.000	0.000	0.2770	0.1162	0.0000	1.21E-07
285		0.00	0.000	0.000	0.2770	0.1162	0.0000	1.21E-07
286		0.57	0.350	0.066	0.2927	0.1161	0.0000	1.21E-07
287		0.02	0.000	0.121	0.2821	0.1161	0.0000	1.21E-07
288		0.00	0.000	0.017	0.2804	0.1161	0.0000	1.21E-07
289		0.00	0.000	0.019	0.2785	0.1160	0.0000	1.21E-07
290		0.03	0.000	0.035	0.2778	0.1160	0.0000	1.21E-07
291		1.07	0.851	0.060	0.2935	0.1160	0.0000	1.21E-07
292		0.42	0.200	0.102	0.3051	0.1159	0.0000	1.21E-07
293		0.60	0.411	0.077	0.3167	0.1159	0.0000	1.21E-07
294		0.00	0.000	0.098	0.3068	0.1159	0.0000	1.20E-07
295		0.00	0.000	0.095	0.2973	0.1158	0.0000	1.20E-07
296		0.00	0.000	0.095	0.2878	0.1158	0.0000	1.20E-07
297		0.10	0.000	0.149	0.2834	0.1157	0.0000	1.20E-07
298		0.00	0.000	0.041	0.2793	0.1157	0.0000	1.20E-07
299		0.00	0.000	0.016	0.2777	0.1157	0.0000	1.20E-07
300		0.00	0.000	0.005	0.2772	0.1156	0.0000	1.20E-07
301		0.00	0.000	0.001	0.2770	0.1156	0.0000	1.20E-07
302		0.00	0.000	0.000	0.2770	0.1156	0.0000	1.20E-07
303		0.31	0.129	0.052	0.2894	0.1155	0.0000	1.20E-07
304		0.05	0.000	0.052	0.2896	0.1155	0.0000	1.20E-07
305		0.00	0.000	0.012	0.2886	0.1155	0.0000	1.20E-07
306	*	0.00	0.000	0.000	0.2886	0.1154	0.0000	1.20E-07
307		0.00	0.000	0.018	0.2868	0.1154	0.0000	1.20E-07
308		0.39	0.179	0.063	0.3012	0.1154	0.0000	1.20E-07
309		0.00	0.000	0.031	0.2981	0.1153	0.0000	1.20E-07
310		0.00	0.000	0.035	0.2946	0.1153	0.0000	1.20E-07
311		0.00	0.000	0.024	0.2923	0.1153	0.0000	1.20E-07
312	*	0.00	0.000	0.000	0.2923	0.1152	0.0000	1.20E-07

313	*	0.10	0.000	0.042	0.2942	0.1152	0.0000	1.20E-07
314		1.07	0.977	0.000	0.3069	0.1152	0.0000	1.20E-07
315	*	0.06	0.000	0.050	0.3083	0.1151	0.0000	1.20E-07
316		0.14	0.002	0.058	0.3164	0.1151	0.0000	1.20E-07
317		0.00	0.000	0.027	0.3137	0.1151	0.0000	1.20E-07
318	*	0.00	0.000	0.015	0.3123	0.1150	0.0000	1.20E-07
319		0.61	0.406	0.065	0.3259	0.1150	0.0000	1.20E-07
320		0.00	0.000	0.031	0.3230	0.1150	0.0000	1.20E-07
321		0.24	0.071	0.077	0.3319	0.1149	0.0000	1.20E-07
322		0.00	0.000	0.088	0.3231	0.1149	0.0000	1.20E-07
323		0.00	0.000	0.120	0.3112	0.1149	0.0000	1.20E-07
324		0.00	0.000	0.031	0.3081	0.1148	0.0000	1.20E-07
325		0.00	0.000	0.066	0.3015	0.1148	0.0000	1.20E-07
326		0.00	0.000	0.027	0.2989	0.1148	0.0000	1.19E-07
327		0.00	0.000	0.033	0.2956	0.1147	0.0000	1.19E-07
328	*	0.00	0.000	0.012	0.2944	0.1147	0.0000	1.19E-07
329		0.56	0.344	0.063	0.3101	0.1147	0.0000	1.19E-07
330	*	0.00	0.000	0.001	0.3101	0.1146	0.0000	1.19E-07
331		1.24	1.054	0.053	0.3235	0.1146	0.0000	1.19E-07
332		0.00	0.000	0.026	0.3209	0.1146	0.0000	1.19E-07
333		0.00	0.000	0.035	0.3173	0.1145	0.0000	1.19E-07
334		0.00	0.000	0.031	0.3143	0.1145	0.0000	1.19E-07
335		0.00	0.000	0.019	0.3124	0.1145	0.0000	1.19E-07
336		0.07	0.000	0.052	0.3146	0.1144	0.0000	1.19E-07
337	*	0.00	0.000	0.017	0.3128	0.1146	0.0000	1.19E-07
338	*	0.00	0.000	0.000	0.3128	0.1151	0.0000	1.20E-07
339	*	0.00	0.000	0.000	0.3128	0.1151	0.0000	1.20E-07
340		0.00	0.000	0.016	0.3112	0.1150	0.0000	1.20E-07
341	*	0.00	0.000	0.000	0.3112	0.1150	0.0000	1.20E-07
342	*	0.00	0.000	0.014	0.3098	0.1150	0.0000	1.20E-07
343	*	0.00	0.000	0.015	0.3084	0.1149	0.0000	1.20E-07
344		0.00	0.000	0.016	0.3067	0.1149	0.0000	1.20E-07

345		0.00	0.000	0.016	0.3051	0.1149	0.0000	1.20E-07
346		0.00	0.000	0.015	0.3036	0.1148	0.0000	1.20E-07
347		0.02	0.000	0.033	0.3024	0.1148	0.0000	1.19E-07
348		0.00	0.000	0.022	0.3002	0.1148	0.0000	1.19E-07
349		0.00	0.000	0.030	0.2972	0.1147	0.0000	1.19E-07
350		0.00	0.000	0.024	0.2948	0.1147	0.0000	1.19E-07
351		0.00	0.000	0.018	0.2930	0.1147	0.0000	1.19E-07
352	*	0.00	0.000	0.001	0.2930	0.1146	0.0000	1.19E-07
353	*	0.77	0.000	0.025	0.2950	0.1146	0.0000	1.19E-07
354	*	0.18	0.000	0.012	0.2969	0.1146	0.0000	1.19E-07
355	*	0.00	0.000	0.026	0.2989	0.1145	0.0000	1.19E-07
356	*	0.00	0.000	0.014	0.3009	0.1145	0.0000	1.19E-07
357		0.77	1.450	0.000	0.3136	0.1145	0.0000	1.19E-07
358		0.01	0.000	0.018	0.3123	0.1144	0.0000	1.19E-07
359	*	0.10	0.000	0.030	0.3143	0.1144	0.0000	1.19E-07
360		0.00	0.000	0.069	0.3126	0.1144	0.0000	1.19E-07
361		0.00	0.000	0.042	0.3084	0.1143	0.0000	1.19E-07
362		0.00	0.000	0.017	0.3067	0.1143	0.0000	1.19E-07
363	*	0.00	0.000	0.016	0.3052	0.1143	0.0000	1.19E-07
364		0.00	0.000	0.018	0.3033	0.1142	0.0000	1.19E-07
365		0.00	0.000	0.035	0.2999	0.1142	0.0000	1.19E-07

* = Frozen (air or soil)

Annual Totals for Year 28			
	inches	cubic feet	percent
Precipitation	40.07	145,445.7	100.00
Runoff	23.128	83,954.2	57.72
Evapotranspiration	16.828	61,086.1	42.00
Recirculation into Layer 1	0.0050	18.0	0.01
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0050	18.0	0.01
Percolation/Leakage through Layer 5	0.000045	0.1644	0.00
Average Head on Top of Layer 4	0.1193	---	---
Change in Water Storage	0.1117	405.3	0.28
Soil Water at Start of Year	1,406.6180	5,106,023.4	3510.60
Soil Water at End of Year	1,406.7297	5,106,428.7	3510.88
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0050	-18.0	-0.01

Daily Output for Year 29

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1			0.01	0.000	0.039	0.2974	0.1141	0.0000	1.19E-07
2	*		0.10	0.000	0.032	0.2994	0.1141	0.0000	1.19E-07
3	*		0.22	0.000	0.000	0.3014	0.1141	0.0000	1.19E-07
4			0.08	0.176	0.022	0.3141	0.1140	0.0000	1.19E-07
5	*		0.00	0.000	0.000	0.3141	0.1140	0.0000	1.19E-07
6	*		0.00	0.000	0.011	0.3130	0.1140	0.0000	1.19E-07
7			0.00	0.000	0.031	0.3099	0.1139	0.0000	1.19E-07
8			0.00	0.000	0.029	0.3070	0.1139	0.0000	1.19E-07
9			0.00	0.000	0.038	0.3032	0.1139	0.0000	1.19E-07
10			0.01	0.000	0.020	0.3018	0.1138	0.0000	1.19E-07
11			0.01	0.000	0.049	0.2981	0.1138	0.0000	1.19E-07
12			0.00	0.000	0.036	0.2945	0.1138	0.0000	1.19E-07
13			0.44	0.194	0.110	0.3083	0.1137	0.0000	1.18E-07
14			0.04	0.000	0.040	0.3082	0.1137	0.0000	1.18E-07
15			0.00	0.000	0.024	0.3058	0.1137	0.0000	1.18E-07
16			0.07	0.000	0.066	0.3060	0.1136	0.0000	1.18E-07
17			0.00	0.000	0.034	0.3026	0.1136	0.0000	1.18E-07
18			0.00	0.000	0.038	0.2988	0.1136	0.0000	1.18E-07
19			0.00	0.000	0.019	0.2971	0.1135	0.0000	1.18E-07
20			0.00	0.000	0.025	0.2946	0.1135	0.0000	1.18E-07
21			0.06	0.000	0.061	0.2950	0.1135	0.0000	1.18E-07
22			0.00	0.000	0.030	0.2920	0.1134	0.0000	1.18E-07
23			0.00	0.000	0.030	0.2890	0.1134	0.0000	1.18E-07
24			0.00	0.000	0.025	0.2865	0.1134	0.0000	1.18E-07

25		0.00	0.000	0.020	0.2845	0.1133	0.0000	1.18E-07
26		0.00	0.000	0.032	0.2812	0.1133	0.0000	1.18E-07
27		0.00	0.000	0.032	0.2780	0.1133	0.0000	1.18E-07
28		0.00	0.000	0.008	0.2772	0.1132	0.0000	1.18E-07
29		0.00	0.000	0.001	0.2770	0.1132	0.0000	1.18E-07
30		0.00	0.000	0.000	0.2770	0.1132	0.0000	1.18E-07
31		0.16	0.000	0.044	0.2890	0.1131	0.0000	1.18E-07
32		0.21	0.038	0.055	0.3003	0.1131	0.0000	1.18E-07
33		0.10	0.000	0.053	0.3050	0.1131	0.0000	1.18E-07
34	*	0.07	0.000	0.049	0.3070	0.1130	0.0000	1.18E-07
35		0.00	0.000	0.030	0.3040	0.1130	0.0000	1.18E-07
36	*	0.67	0.000	0.030	0.3060	0.1130	0.0000	1.18E-07
37	*	0.36	0.000	0.032	0.3080	0.1129	0.0000	1.18E-07
38	*	0.00	0.000	0.015	0.3099	0.1129	0.0000	1.18E-07
39	*	0.00	0.000	0.009	0.3119	0.1129	0.0000	1.18E-07
40	*	0.00	0.000	0.023	0.3139	0.1128	0.0000	1.18E-07
41		0.00	0.694	0.000	0.3266	0.1128	0.0000	1.18E-07
42		0.00	0.000	0.030	0.3236	0.1128	0.0000	1.18E-07
43	*	0.00	0.000	0.015	0.3221	0.1127	0.0000	1.18E-07
44		0.00	0.000	0.039	0.3186	0.1127	0.0000	1.18E-07
45		0.28	0.101	0.100	0.3269	0.1127	0.0000	1.17E-07
46		0.04	0.000	0.112	0.3193	0.1126	0.0000	1.17E-07
47		0.15	0.003	0.105	0.3231	0.1126	0.0000	1.17E-07
48		0.01	0.000	0.042	0.3197	0.1126	0.0000	1.17E-07
49		0.92	0.667	0.109	0.3336	0.1126	0.0000	1.17E-07
50		0.00	0.000	0.026	0.3311	0.1125	0.0000	1.17E-07
51		0.00	0.000	0.034	0.3277	0.1125	0.0000	1.17E-07
52		0.00	0.000	0.035	0.3242	0.1125	0.0000	1.17E-07
53		0.00	0.000	0.045	0.3197	0.1124	0.0000	1.17E-07
54		0.00	0.000	0.020	0.3177	0.1124	0.0000	1.17E-07
55		0.02	0.000	0.049	0.3152	0.1124	0.0000	1.17E-07
56		0.00	0.000	0.019	0.3133	0.1123	0.0000	1.17E-07

57		0.00	0.000	0.082	0.3051	0.1123	0.0000	1.17E-07
58		0.00	0.000	0.059	0.2993	0.1123	0.0000	1.17E-07
59		0.11	0.000	0.080	0.3019	0.1122	0.0000	1.17E-07
60		0.00	0.000	0.170	0.2850	0.1122	0.0000	1.17E-07
61		0.00	0.000	0.038	0.2812	0.1122	0.0000	1.17E-07
62		0.11	0.000	0.073	0.2844	0.1121	0.0000	1.17E-07
63		0.03	0.000	0.035	0.2837	0.1121	0.0000	1.17E-07
64		0.57	0.371	0.073	0.2968	0.1121	0.0000	1.17E-07
65		0.00	0.000	0.019	0.2949	0.1120	0.0000	1.17E-07
66		0.00	0.000	0.035	0.2914	0.1120	0.0000	1.17E-07
67		0.00	0.000	0.034	0.2880	0.1120	0.0000	1.17E-07
68	*	0.00	0.000	0.013	0.2867	0.1119	0.0000	1.17E-07
69		0.50	0.273	0.073	0.3017	0.1119	0.0000	1.17E-07
70		0.00	0.000	0.036	0.2981	0.1119	0.0000	1.17E-07
71		0.00	0.000	0.030	0.2951	0.1118	0.0000	1.17E-07
72		0.00	0.000	0.041	0.2909	0.1118	0.0000	1.17E-07
73		0.00	0.000	0.047	0.2862	0.1118	0.0000	1.17E-07
74		0.00	0.000	0.048	0.2815	0.1117	0.0000	1.17E-07
75		0.00	0.000	0.020	0.2795	0.1117	0.0000	1.17E-07
76		0.04	0.000	0.051	0.2782	0.1117	0.0000	1.17E-07
77		0.00	0.000	0.007	0.2775	0.1116	0.0000	1.16E-07
78		0.00	0.000	0.006	0.2771	0.1116	0.0000	1.16E-07
79		1.61	1.369	0.081	0.2934	0.1116	0.0000	1.16E-07
80		0.00	0.000	0.031	0.2903	0.1115	0.0000	1.16E-07
81		0.00	0.000	0.039	0.2864	0.1115	0.0000	1.16E-07
82		0.02	0.000	0.079	0.2808	0.1115	0.0000	1.16E-07
83		0.00	0.000	0.021	0.2787	0.1114	0.0000	1.16E-07
84		0.84	0.615	0.064	0.2948	0.1114	0.0000	1.16E-07
85		0.37	0.168	0.084	0.3064	0.1114	0.0000	1.16E-07
86		0.05	0.000	0.061	0.3053	0.1113	0.0000	1.16E-07
87		0.04	0.000	0.047	0.3049	0.1113	0.0000	1.16E-07
88		0.03	0.000	0.079	0.2998	0.1113	0.0000	1.16E-07

89		0.69	0.381	0.176	0.3133	0.1112	0.0000	1.16E-07
90		0.00	0.000	0.059	0.3075	0.1112	0.0000	1.16E-07
91	*	0.08	0.000	0.047	0.3094	0.1112	0.0000	1.16E-07
92	*	0.35	0.000	0.000	0.3114	0.1111	0.0000	1.16E-07
93		0.00	0.117	0.095	0.3241	0.1111	0.0000	1.16E-07
94		0.00	0.000	0.123	0.3118	0.1111	0.0000	1.16E-07
95		1.61	1.193	0.272	0.3259	0.1110	0.0000	1.16E-07
96		0.00	0.000	0.038	0.3223	0.1110	0.0000	1.16E-07
97		0.00	0.000	0.097	0.3126	0.1110	0.0000	1.16E-07
98		0.00	0.000	0.156	0.2970	0.1109	0.0000	1.16E-07
99		0.00	0.000	0.131	0.2839	0.1109	0.0000	1.16E-07
100		0.00	0.000	0.063	0.2776	0.1109	0.0000	1.16E-07
101		0.00	0.000	0.004	0.2771	0.1108	0.0000	1.16E-07
102		0.31	0.130	0.059	0.2889	0.1108	0.0000	1.16E-07
103		0.00	0.000	0.012	0.2877	0.1108	0.0000	1.16E-07
104		0.00	0.000	0.029	0.2849	0.1108	0.0000	1.16E-07
105		0.00	0.000	0.029	0.2820	0.1107	0.0000	1.16E-07
106		0.00	0.000	0.033	0.2787	0.1107	0.0000	1.16E-07
107		0.00	0.000	0.013	0.2773	0.1107	0.0000	1.16E-07
108		0.00	0.000	0.003	0.2770	0.1106	0.0000	1.16E-07
109		0.00	0.000	0.000	0.2770	0.1106	0.0000	1.15E-07
110		0.00	0.000	0.000	0.2770	0.1106	0.0000	1.15E-07
111		0.23	0.058	0.049	0.2895	0.1105	0.0000	1.15E-07
112		0.06	0.000	0.041	0.2916	0.1105	0.0000	1.15E-07
113		0.00	0.000	0.013	0.2903	0.1105	0.0000	1.15E-07
114		0.84	0.645	0.060	0.3042	0.1104	0.0000	1.15E-07
115		0.56	0.329	0.119	0.3158	0.1104	0.0000	1.15E-07
116	*	0.03	0.000	0.078	0.3111	0.1104	0.0000	1.15E-07
117		0.17	0.008	0.126	0.3151	0.1103	0.0000	1.15E-07
118		0.09	0.000	0.109	0.3132	0.1103	0.0000	1.15E-07
119		1.26	1.062	0.070	0.3258	0.1103	0.0000	1.15E-07
120		0.00	0.000	0.059	0.3202	0.1102	0.0000	1.15E-07

121	0.27	0.098	0.147	0.3230	0.1102	0.0000	1.15E-07
122	0.38	0.196	0.128	0.3290	0.1102	0.0000	1.15E-07
123	0.00	0.000	0.128	0.3162	0.1101	0.0000	1.15E-07
124	0.00	0.000	0.074	0.3088	0.1101	0.0000	1.15E-07
125	0.00	0.000	0.120	0.2968	0.1101	0.0000	1.15E-07
126	0.00	0.000	0.093	0.2875	0.1100	0.0000	1.15E-07
127	0.00	0.000	0.086	0.2789	0.1100	0.0000	1.15E-07
128	0.00	0.000	0.016	0.2773	0.1100	0.0000	1.15E-07
129	0.00	0.000	0.003	0.2770	0.1099	0.0000	1.15E-07
130	0.00	0.000	0.000	0.2770	0.1099	0.0000	1.15E-07
131	0.00	0.000	0.000	0.2770	0.1099	0.0000	1.15E-07
132	0.00	0.000	0.000	0.2770	0.1099	0.0000	1.15E-07
133	0.00	0.000	0.000	0.2770	0.1098	0.0000	1.15E-07
134	0.20	0.027	0.050	0.2895	0.1098	0.0000	1.15E-07
135	0.00	0.000	0.011	0.2884	0.1098	0.0000	1.15E-07
136	0.00	0.000	0.016	0.2868	0.1097	0.0000	1.15E-07
137	0.32	0.121	0.061	0.3009	0.1097	0.0000	1.15E-07
138	0.00	0.000	0.016	0.2993	0.1097	0.0000	1.15E-07
139	0.00	0.000	0.016	0.2977	0.1096	0.0000	1.15E-07
140	0.48	0.288	0.058	0.3110	0.1096	0.0000	1.15E-07
141	0.00	0.000	0.068	0.3042	0.1096	0.0000	1.15E-07
142	0.17	0.003	0.156	0.3049	0.1095	0.0000	1.14E-07
143	0.05	0.000	0.075	0.3020	0.1095	0.0000	1.14E-07
144	0.00	0.000	0.123	0.2896	0.1095	0.0000	1.14E-07
145	0.00	0.000	0.084	0.2813	0.1094	0.0000	1.14E-07
146	0.00	0.000	0.035	0.2778	0.1094	0.0000	1.14E-07
147	0.00	0.000	0.007	0.2771	0.1094	0.0000	1.14E-07
148	0.02	0.000	0.019	0.2771	0.1093	0.0000	1.14E-07
149	0.00	0.000	0.001	0.2770	0.1093	0.0000	1.14E-07
150	0.00	0.000	0.000	0.2770	0.1093	0.0000	1.14E-07
151	0.00	0.000	0.000	0.2770	0.1093	0.0000	1.14E-07
152	0.00	0.000	0.000	0.2770	0.1092	0.0000	1.14E-07

153	0.00	0.000	0.000	0.2770	0.1092	0.0000	1.14E-07
154	0.70	0.476	0.062	0.2932	0.1092	0.0000	1.14E-07
155	0.00	0.000	0.010	0.2921	0.1091	0.0000	1.14E-07
156	0.00	0.000	0.017	0.2905	0.1091	0.0000	1.14E-07
157	0.17	0.012	0.055	0.3012	0.1091	0.0000	1.14E-07
158	0.00	0.000	0.015	0.2997	0.1090	0.0000	1.14E-07
159	0.23	0.060	0.055	0.3115	0.1090	0.0000	1.14E-07
160	0.00	0.000	0.058	0.3058	0.1090	0.0000	1.14E-07
161	0.00	0.000	0.103	0.2955	0.1089	0.0000	1.14E-07
162	0.00	0.000	0.095	0.2860	0.1089	0.0000	1.14E-07
163	0.74	0.485	0.098	0.3014	0.1089	0.0000	1.14E-07
164	0.01	0.000	0.131	0.2891	0.1088	0.0000	1.14E-07
165	0.00	0.000	0.038	0.2853	0.1088	0.0000	1.14E-07
166	0.00	0.000	0.030	0.2823	0.1088	0.0000	1.14E-07
167	0.00	0.000	0.029	0.2794	0.1087	0.0000	1.14E-07
168	0.00	0.000	0.021	0.2773	0.1087	0.0000	1.14E-07
169	0.00	0.000	0.003	0.2770	0.1087	0.0000	1.14E-07
170	0.00	0.000	0.000	0.2770	0.1086	0.0000	1.14E-07
171	0.00	0.000	0.000	0.2770	0.1086	0.0000	1.14E-07
172	0.00	0.000	0.000	0.2770	0.1086	0.0000	1.14E-07
173	0.00	0.000	0.000	0.2770	0.1086	0.0000	1.14E-07
174	0.00	0.000	0.000	0.2770	0.1085	0.0000	1.14E-07
175	0.00	0.000	0.000	0.2770	0.1085	0.0000	1.13E-07
176	0.00	0.000	0.000	0.2770	0.1085	0.0000	1.13E-07
177	0.12	0.000	0.040	0.2855	0.1084	0.0000	1.13E-07
178	0.01	0.000	0.024	0.2846	0.1084	0.0000	1.13E-07
179	0.00	0.000	0.016	0.2830	0.1084	0.0000	1.13E-07
180	0.00	0.000	0.017	0.2813	0.1083	0.0000	1.13E-07
181	0.98	0.773	0.058	0.2958	0.1083	0.0000	1.13E-07
182	0.02	0.000	0.049	0.2929	0.1083	0.0000	1.13E-07
183	0.00	0.000	0.062	0.2867	0.1082	0.0000	1.13E-07
184	0.00	0.000	0.069	0.2799	0.1082	0.0000	1.13E-07

185	0.00	0.000	0.022	0.2777	0.1082	0.0000	1.13E-07
186	0.00	0.000	0.005	0.2772	0.1081	0.0000	1.13E-07
187	0.00	0.000	0.001	0.2770	0.1081	0.0000	1.13E-07
188	0.00	0.000	0.000	0.2770	0.1081	0.0000	1.13E-07
189	0.00	0.000	0.000	0.2770	0.1081	0.0000	1.13E-07
190	0.00	0.000	0.000	0.2770	0.1080	0.0000	1.13E-07
191	0.25	0.072	0.054	0.2892	0.1080	0.0000	1.13E-07
192	0.03	0.000	0.032	0.2888	0.1080	0.0000	1.13E-07
193	0.00	0.000	0.020	0.2868	0.1079	0.0000	1.13E-07
194	0.00	0.000	0.020	0.2848	0.1079	0.0000	1.13E-07
195	0.35	0.150	0.065	0.2987	0.1079	0.0000	1.13E-07
196	0.04	0.000	0.043	0.2989	0.1078	0.0000	1.13E-07
197	0.03	0.000	0.042	0.2977	0.1078	0.0000	1.13E-07
198	0.00	0.000	0.019	0.2958	0.1078	0.0000	1.13E-07
199	0.00	0.000	0.019	0.2939	0.1077	0.0000	1.13E-07
200	0.05	0.000	0.043	0.2944	0.1077	0.0000	1.13E-07
201	0.00	0.000	0.018	0.2926	0.1077	0.0000	1.13E-07
202	0.00	0.000	0.022	0.2904	0.1076	0.0000	1.13E-07
203	1.29	1.093	0.066	0.3039	0.1076	0.0000	1.13E-07
204	0.76	0.435	0.242	0.3122	0.1076	0.0000	1.13E-07
205	0.22	0.051	0.162	0.3131	0.1075	0.0000	1.13E-07
206	0.08	0.000	0.085	0.3127	0.1075	0.0000	1.13E-07
207	0.04	0.000	0.166	0.2996	0.1075	0.0000	1.13E-07
208	1.08	0.842	0.098	0.3135	0.1075	0.0000	1.13E-07
209	0.01	0.000	0.055	0.3092	0.1074	0.0000	1.12E-07
210	0.00	0.000	0.117	0.2974	0.1074	0.0000	1.12E-07
211	0.31	0.126	0.159	0.3002	0.1074	0.0000	1.12E-07
212	0.05	0.000	0.202	0.2854	0.1073	0.0000	1.12E-07
213	0.23	0.046	0.164	0.2878	0.1073	0.0000	1.12E-07
214	1.55	1.344	0.100	0.2988	0.1073	0.0000	1.12E-07
215	0.00	0.000	0.110	0.2878	0.1074	0.0000	1.12E-07
216	0.00	0.000	0.085	0.2794	0.1078	0.0000	1.13E-07

217	0.00	0.000	0.018	0.2776	0.1077	0.0000	1.13E-07
218	0.00	0.000	0.004	0.2771	0.1077	0.0000	1.13E-07
219	0.00	0.000	0.001	0.2770	0.1077	0.0000	1.13E-07
220	0.00	0.000	0.000	0.2770	0.1076	0.0000	1.13E-07
221	0.00	0.000	0.000	0.2770	0.1076	0.0000	1.13E-07
222	0.00	0.000	0.000	0.2770	0.1076	0.0000	1.13E-07
223	0.00	0.000	0.000	0.2770	0.1075	0.0000	1.13E-07
224	0.00	0.000	0.000	0.2770	0.1075	0.0000	1.13E-07
225	0.53	0.315	0.068	0.2921	0.1075	0.0000	1.13E-07
226	0.00	0.000	0.013	0.2909	0.1074	0.0000	1.13E-07
227	0.00	0.000	0.019	0.2889	0.1074	0.0000	1.12E-07
228	0.00	0.000	0.019	0.2870	0.1074	0.0000	1.12E-07
229	0.00	0.000	0.022	0.2848	0.1074	0.0000	1.12E-07
230	0.00	0.000	0.018	0.2830	0.1073	0.0000	1.12E-07
231	0.00	0.000	0.019	0.2811	0.1073	0.0000	1.12E-07
232	0.00	0.000	0.016	0.2795	0.1073	0.0000	1.12E-07
233	0.00	0.000	0.021	0.2774	0.1072	0.0000	1.12E-07
234	0.45	0.246	0.063	0.2913	0.1072	0.0000	1.12E-07
235	0.00	0.000	0.078	0.2835	0.1072	0.0000	1.12E-07
236	0.07	0.000	0.050	0.2856	0.1071	0.0000	1.12E-07
237	0.42	0.234	0.063	0.2977	0.1071	0.0000	1.12E-07
238	0.98	0.590	0.293	0.3078	0.1071	0.0000	1.12E-07
239	0.14	0.005	0.096	0.3118	0.1070	0.0000	1.12E-07
240	0.00	0.000	0.218	0.2900	0.1070	0.0000	1.12E-07
241	0.00	0.000	0.114	0.2786	0.1070	0.0000	1.12E-07
242	0.00	0.000	0.012	0.2774	0.1070	0.0000	1.12E-07
243	0.00	0.000	0.003	0.2771	0.1069	0.0000	1.12E-07
244	0.02	0.000	0.019	0.2770	0.1069	0.0000	1.12E-07
245	0.00	0.000	0.001	0.2770	0.1069	0.0000	1.12E-07
246	0.00	0.000	0.000	0.2770	0.1068	0.0000	1.12E-07
247	0.26	0.087	0.057	0.2891	0.1068	0.0000	1.12E-07
248	0.22	0.063	0.055	0.2996	0.1068	0.0000	1.12E-07

249		0.29	0.114	0.100	0.3073	0.1067	0.0000	1.12E-07
250		0.00	0.000	0.081	0.2992	0.1067	0.0000	1.12E-07
251		0.00	0.000	0.024	0.2969	0.1067	0.0000	1.12E-07
252		0.00	0.000	0.041	0.2928	0.1067	0.0000	1.12E-07
253		0.00	0.000	0.033	0.2895	0.1066	0.0000	1.12E-07
254		0.00	0.000	0.026	0.2869	0.1066	0.0000	1.12E-07
255		0.00	0.000	0.020	0.2849	0.1066	0.0000	1.12E-07
256	*	0.00	0.000	0.026	0.2824	0.1065	0.0000	1.12E-07
257		0.00	0.000	0.026	0.2798	0.1065	0.0000	1.12E-07
258		0.00	0.000	0.022	0.2775	0.1065	0.0000	1.12E-07
259		0.00	0.000	0.005	0.2771	0.1064	0.0000	1.12E-07
260		0.19	0.016	0.051	0.2896	0.1064	0.0000	1.12E-07
261		0.00	0.000	0.010	0.2886	0.1064	0.0000	1.11E-07
262		0.00	0.000	0.017	0.2869	0.1063	0.0000	1.11E-07
263		0.00	0.000	0.016	0.2853	0.1063	0.0000	1.11E-07
264		0.00	0.000	0.016	0.2837	0.1063	0.0000	1.11E-07
265		0.00	0.000	0.016	0.2821	0.1063	0.0000	1.11E-07
266		0.00	0.000	0.016	0.2805	0.1062	0.0000	1.11E-07
267		0.00	0.000	0.016	0.2789	0.1062	0.0000	1.11E-07
268		0.06	0.000	0.046	0.2808	0.1062	0.0000	1.11E-07
269		0.00	0.000	0.007	0.2801	0.1061	0.0000	1.11E-07
270		0.00	0.000	0.009	0.2792	0.1061	0.0000	1.11E-07
271		0.08	0.000	0.039	0.2831	0.1061	0.0000	1.11E-07
272		0.00	0.000	0.009	0.2821	0.1060	0.0000	1.11E-07
273		0.00	0.000	0.011	0.2813	0.1060	0.0000	1.11E-07
274		0.39	0.192	0.057	0.2953	0.1060	0.0000	1.11E-07
275		0.00	0.000	0.009	0.2944	0.1060	0.0000	1.11E-07
276		0.05	0.000	0.039	0.2954	0.1059	0.0000	1.11E-07
277		0.00	0.000	0.013	0.2942	0.1059	0.0000	1.11E-07
278		1.57	1.386	0.056	0.3074	0.1059	0.0000	1.11E-07
279		0.00	0.000	0.082	0.2992	0.1058	0.0000	1.11E-07
280		0.00	0.000	0.026	0.2966	0.1058	0.0000	1.11E-07

281		0.00	0.000	0.048	0.2918	0.1058	0.0000	1.11E-07
282		0.50	0.246	0.106	0.3066	0.1057	0.0000	1.11E-07
283		0.00	0.000	0.022	0.3044	0.1057	0.0000	1.11E-07
284		0.00	0.000	0.037	0.3007	0.1057	0.0000	1.11E-07
285		0.01	0.000	0.069	0.2951	0.1056	0.0000	1.11E-07
286		0.00	0.000	0.024	0.2928	0.1056	0.0000	1.11E-07
287		0.02	0.000	0.056	0.2889	0.1056	0.0000	1.11E-07
288	*	0.78	0.000	0.038	0.2908	0.1055	0.0000	1.11E-07
289		0.00	0.000	0.046	0.2928	0.1055	0.0000	1.11E-07
290		0.00	0.298	0.000	0.3055	0.1055	0.0000	1.11E-07
291		0.00	0.068	0.042	0.3172	0.1055	0.0000	1.11E-07
292		0.00	0.000	0.036	0.3136	0.1054	0.0000	1.11E-07
293		0.00	0.000	0.033	0.3103	0.1054	0.0000	1.11E-07
294		0.00	0.000	0.064	0.3039	0.1054	0.0000	1.11E-07
295		0.05	0.000	0.091	0.2997	0.1053	0.0000	1.10E-07
296		0.09	0.000	0.094	0.2992	0.1053	0.0000	1.10E-07
297		0.00	0.000	0.026	0.2966	0.1053	0.0000	1.10E-07
298		0.00	0.000	0.035	0.2931	0.1052	0.0000	1.10E-07
299		0.00	0.000	0.110	0.2821	0.1052	0.0000	1.10E-07
300		0.00	0.000	0.038	0.2784	0.1052	0.0000	1.10E-07
301		0.00	0.000	0.010	0.2773	0.1051	0.0000	1.10E-07
302		0.00	0.000	0.002	0.2771	0.1051	0.0000	1.10E-07
303		0.00	0.000	0.001	0.2770	0.1051	0.0000	1.10E-07
304		0.00	0.000	0.000	0.2770	0.1051	0.0000	1.10E-07
305		0.00	0.000	0.000	0.2770	0.1050	0.0000	1.10E-07
306		0.01	0.000	0.007	0.2770	0.1050	0.0000	1.10E-07
307		0.00	0.000	0.000	0.2770	0.1050	0.0000	1.10E-07
308		0.00	0.000	0.000	0.2770	0.1049	0.0000	1.10E-07
309		0.00	0.000	0.000	0.2770	0.1049	0.0000	1.10E-07
310		0.00	0.000	0.000	0.2770	0.1049	0.0000	1.10E-07
311		0.07	0.000	0.035	0.2803	0.1048	0.0000	1.10E-07
312	*	0.00	0.000	0.001	0.2802	0.1048	0.0000	1.10E-07

313	*	0.00	0.000	0.005	0.2797	0.1048	0.0000	1.10E-07
314	*	0.00	0.000	0.006	0.2791	0.1048	0.0000	1.10E-07
315		0.00	0.000	0.003	0.2788	0.1047	0.0000	1.10E-07
316		0.06	0.000	0.035	0.2813	0.1047	0.0000	1.10E-07
317	*	0.43	0.000	0.029	0.2833	0.1047	0.0000	1.10E-07
318	*	0.00	0.000	0.018	0.2852	0.1046	0.0000	1.10E-07
319	*	0.00	0.000	0.036	0.2872	0.1046	0.0000	1.10E-07
320		0.00	0.076	0.086	0.2999	0.1046	0.0000	1.10E-07
321		0.02	0.000	0.020	0.2995	0.1045	0.0000	1.10E-07
322		0.05	0.000	0.040	0.3008	0.1045	0.0000	1.10E-07
323		0.00	0.000	0.011	0.2997	0.1045	0.0000	1.10E-07
324		0.43	0.245	0.055	0.3129	0.1045	0.0000	1.10E-07
325		0.00	0.000	0.017	0.3113	0.1044	0.0000	1.10E-07
326		0.00	0.000	0.013	0.3100	0.1044	0.0000	1.10E-07
327	*	0.00	0.000	0.016	0.3088	0.1044	0.0000	1.10E-07
328	*	0.43	0.000	0.019	0.3108	0.1043	0.0000	1.10E-07
329	*	0.01	0.000	0.000	0.3128	0.1043	0.0000	1.09E-07
330	*	0.01	0.000	0.000	0.3147	0.1043	0.0000	1.09E-07
331		0.00	0.229	0.020	0.3275	0.1042	0.0000	1.09E-07
332	*	0.00	0.000	0.000	0.3275	0.1042	0.0000	1.09E-07
333		0.00	0.000	0.015	0.3259	0.1042	0.0000	1.09E-07
334		0.00	0.000	0.032	0.3228	0.1041	0.0000	1.09E-07
335		0.05	0.000	0.055	0.3225	0.1041	0.0000	1.09E-07
336		0.47	0.266	0.075	0.3352	0.1041	0.0000	1.09E-07
337		0.11	0.005	0.049	0.3411	0.1041	0.0000	1.09E-07
338	*	0.00	0.000	0.000	0.3411	0.1040	0.0000	1.09E-07
339		0.00	0.000	0.024	0.3387	0.1040	0.0000	1.09E-07
340		0.00	0.000	0.020	0.3367	0.1040	0.0000	1.09E-07
341		0.00	0.000	0.016	0.3350	0.1039	0.0000	1.09E-07
342	*	0.00	0.000	0.000	0.3350	0.1039	0.0000	1.09E-07
343	*	0.00	0.000	0.000	0.3350	0.1039	0.0000	1.09E-07
344	*	0.00	0.000	0.000	0.3350	0.1038	0.0000	1.09E-07

345	*	0.00	0.000	0.013	0.3337	0.1038	0.0000	1.09E-07
346		0.00	0.000	0.018	0.3320	0.1038	0.0000	1.09E-07
347		0.00	0.000	0.022	0.3298	0.1038	0.0000	1.09E-07
348		0.00	0.000	0.029	0.3269	0.1037	0.0000	1.09E-07
349		0.00	0.000	0.015	0.3254	0.1037	0.0000	1.09E-07
350		0.00	0.000	0.015	0.3239	0.1037	0.0000	1.09E-07
351		0.00	0.000	0.010	0.3228	0.1036	0.0000	1.09E-07
352		0.00	0.000	0.016	0.3212	0.1036	0.0000	1.09E-07
353		0.00	0.000	0.018	0.3194	0.1036	0.0000	1.09E-07
354	*	0.00	0.000	0.000	0.3194	0.1035	0.0000	1.09E-07
355		0.00	0.000	0.015	0.3178	0.1035	0.0000	1.09E-07
356		0.00	0.000	0.021	0.3158	0.1035	0.0000	1.09E-07
357		0.00	0.000	0.031	0.3126	0.1034	0.0000	1.09E-07
358		0.00	0.000	0.029	0.3097	0.1034	0.0000	1.09E-07
359		0.00	0.000	0.025	0.3072	0.1034	0.0000	1.09E-07
360		0.00	0.000	0.011	0.3061	0.1034	0.0000	1.09E-07
361		0.00	0.000	0.016	0.3045	0.1033	0.0000	1.09E-07
362		0.00	0.000	0.012	0.3033	0.1033	0.0000	1.09E-07
363	*	0.00	0.000	0.011	0.3022	0.1033	0.0000	1.09E-07
364	*	0.00	0.000	0.000	0.3022	0.1032	0.0000	1.08E-07
365	*	0.00	0.000	0.000	0.3022	0.1032	0.0000	1.08E-07

* = Frozen (air or soil)

Annual Totals for Year 29			
	inches	cubic feet	percent
Precipitation	35.25	127,961.1	100.00
Runoff	19.969	72,485.7	56.65
Evapotranspiration	15.263	55,403.7	43.30
Recirculation into Layer 1	0.0045	16.3	0.01
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0045	16.3	0.01
Percolation/Leakage through Layer 5	0.000041	0.1504	0.00
Average Head on Top of Layer 4	0.1085	---	---
Change in Water Storage	0.0197	71.5	0.06
Soil Water at Start of Year	1,406.7297	5,106,428.7	3990.61
Soil Water at End of Year	1,406.7494	5,106,500.2	3990.67
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0045	-16.3	-0.01

Daily Output for Year 30

Column key: Head #1: drainage from Layer 4
Drain #1: drainage from Layer 3
Leak #1: leakage thru Layer 5

Title: AEL Lateral Expansion
Simulated On: 6/29/2023 9:04

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)
1	*		0.00	0.000	0.000	0.3022	0.1032	0.0000	1.08E-07
2	*		0.00	0.000	0.000	0.3022	0.1031	0.0000	1.08E-07
3	*		0.03	0.000	0.014	0.3038	0.1031	0.0000	1.08E-07
4	*	*	0.00	0.000	0.000	0.3038	0.1031	0.0000	1.08E-07
5	*	*	0.00	0.000	0.000	0.3038	0.1031	0.0000	1.08E-07
6	*	*	0.00	0.000	0.000	0.3038	0.1030	0.0000	1.08E-07
7	*	*	0.00	0.000	0.000	0.3038	0.1030	0.0000	1.08E-07
8	*	*	0.00	0.000	0.000	0.3038	0.1030	0.0000	1.08E-07
9	*	*	0.00	0.000	0.000	0.3038	0.1029	0.0000	1.08E-07
10	*	*	0.43	0.000	0.009	0.3038	0.1029	0.0000	1.08E-07
11	*	*	0.00	0.000	0.021	0.3038	0.1029	0.0000	1.08E-07
12	*	*	0.00	0.000	0.023	0.3038	0.1028	0.0000	1.08E-07
13	*	*	0.00	0.000	0.000	0.3038	0.1028	0.0000	1.08E-07
14	*	*	0.03	0.000	0.019	0.3038	0.1028	0.0000	1.08E-07
15		*	0.00	0.334	0.022	0.3069	0.1028	0.0000	1.08E-07
16		*	0.17	0.131	0.040	0.3069	0.1027	0.0000	1.08E-07
17			0.00	0.000	0.043	0.3026	0.1027	0.0000	1.08E-07
18			0.03	0.000	0.052	0.2999	0.1027	0.0000	1.08E-07
19			0.03	0.000	0.046	0.2979	0.1026	0.0000	1.08E-07
20			0.19	0.017	0.055	0.3092	0.1026	0.0000	1.08E-07
21			0.08	0.000	0.081	0.3090	0.1026	0.0000	1.08E-07
22			0.12	0.000	0.082	0.3129	0.1025	0.0000	1.08E-07
23			0.21	0.045	0.071	0.3227	0.1025	0.0000	1.08E-07
24			0.00	0.000	0.019	0.3209	0.1025	0.0000	1.08E-07

25		0.00	0.000	0.055	0.3153	0.1025	0.0000	1.08E-07
26		0.00	0.000	0.050	0.3103	0.1024	0.0000	1.08E-07
27		0.00	0.000	0.021	0.3082	0.1024	0.0000	1.08E-07
28		0.00	0.000	0.067	0.3015	0.1024	0.0000	1.08E-07
29		0.00	0.000	0.097	0.2919	0.1023	0.0000	1.08E-07
30		0.00	0.000	0.039	0.2879	0.1026	0.0000	1.08E-07
31	*	0.00	0.000	0.020	0.2858	0.1044	0.0000	1.10E-07
32	*	0.00	0.000	0.000	0.2858	0.1043	0.0000	1.10E-07
33		0.00	0.000	0.026	0.2832	0.1043	0.0000	1.09E-07
34	*	0.00	0.000	0.003	0.2832	0.1043	0.0000	1.09E-07
35	*	0.00	0.000	0.000	0.2832	0.1042	0.0000	1.09E-07
36	*	0.00	0.000	0.000	0.2832	0.1042	0.0000	1.09E-07
37	*	0.25	0.000	0.039	0.2852	0.1042	0.0000	1.09E-07
38		0.02	0.012	0.074	0.2974	0.1042	0.0000	1.09E-07
39		0.01	0.000	0.087	0.2901	0.1041	0.0000	1.09E-07
40		0.02	0.000	0.036	0.2886	0.1041	0.0000	1.09E-07
41		0.83	0.615	0.071	0.3033	0.1041	0.0000	1.09E-07
42		0.00	0.000	0.033	0.3000	0.1040	0.0000	1.09E-07
43		0.02	0.000	0.111	0.2911	0.1040	0.0000	1.09E-07
44		0.00	0.000	0.058	0.2853	0.1040	0.0000	1.09E-07
45		0.00	0.000	0.027	0.2826	0.1039	0.0000	1.09E-07
46		0.00	0.000	0.029	0.2797	0.1039	0.0000	1.09E-07
47		0.41	0.205	0.065	0.2936	0.1039	0.0000	1.09E-07
48		0.00	0.000	0.025	0.2910	0.1039	0.0000	1.09E-07
49		0.00	0.000	0.014	0.2896	0.1038	0.0000	1.09E-07
50	*	0.93	0.000	0.024	0.2916	0.1038	0.0000	1.09E-07
51	*	0.34	0.000	0.000	0.2935	0.1038	0.0000	1.09E-07
52	*	0.18	0.000	0.000	0.2955	0.1037	0.0000	1.09E-07
53	*	0.00	0.000	0.034	0.2975	0.1037	0.0000	1.09E-07
54	*	0.00	0.000	0.016	0.2994	0.1037	0.0000	1.09E-07
55		0.00	0.310	0.000	0.3122	0.1036	0.0000	1.09E-07
56	*	0.00	0.000	0.027	0.3142	0.1036	0.0000	1.09E-07

57	*		0.00	0.000	0.030	0.3161	0.1036	0.0000	1.09E-07
58	*		0.00	0.000	0.032	0.3181	0.1035	0.0000	1.09E-07
59	*		0.00	0.000	0.017	0.3201	0.1035	0.0000	1.09E-07
60	*		0.00	0.000	0.033	0.3221	0.1035	0.0000	1.09E-07
61	*		0.00	0.000	0.035	0.3241	0.1035	0.0000	1.09E-07
62	*		0.00	0.000	0.038	0.3261	0.1034	0.0000	1.09E-07
63			0.25	0.615	0.000	0.3388	0.1034	0.0000	1.09E-07
64	*		0.12	0.000	0.082	0.3408	0.1034	0.0000	1.09E-07
65	*		0.03	0.000	0.055	0.3399	0.1033	0.0000	1.09E-07
66	*		0.00	0.000	0.036	0.3363	0.1033	0.0000	1.09E-07
67			0.00	0.000	0.071	0.3292	0.1033	0.0000	1.09E-07
68	*		0.00	0.000	0.042	0.3251	0.1032	0.0000	1.08E-07
69			0.00	0.000	0.046	0.3204	0.1032	0.0000	1.08E-07
70	*		0.00	0.000	0.000	0.3204	0.1032	0.0000	1.08E-07
71			0.00	0.000	0.047	0.3157	0.1032	0.0000	1.08E-07
72	*		0.00	0.000	0.000	0.3157	0.1031	0.0000	1.08E-07
73	*	*	0.11	0.000	0.034	0.3157	0.1031	0.0000	1.08E-07
74	*	*	0.37	0.000	0.024	0.3157	0.1031	0.0000	1.08E-07
75	*	*	0.06	0.000	0.000	0.3157	0.1030	0.0000	1.08E-07
76	*	*	0.80	0.000	0.000	0.3157	0.1030	0.0000	1.08E-07
77		*	0.84	2.088	0.000	0.3194	0.1030	0.0000	1.08E-07
78		*	0.00	0.000	0.000	0.3194	0.1029	0.0000	1.08E-07
79			0.00	0.000	0.108	0.3086	0.1029	0.0000	1.08E-07
80			0.00	0.000	0.065	0.3021	0.1029	0.0000	1.08E-07
81	*		0.00	0.000	0.000	0.3021	0.1029	0.0000	1.08E-07
82	*	*	0.00	0.000	0.000	0.3021	0.1028	0.0000	1.08E-07
83	*	*	0.00	0.000	0.000	0.3021	0.1028	0.0000	1.08E-07
84	*	*	0.83	0.000	0.032	0.3021	0.1028	0.0000	1.08E-07
85	*	*	0.69	0.000	0.018	0.3021	0.1028	0.0000	1.08E-07
86	*	*	0.00	0.000	0.047	0.3021	0.1027	0.0000	1.08E-07
87	*	*	0.35	0.000	0.029	0.3021	0.1027	0.0000	1.08E-07
88	*	*	0.00	0.000	0.021	0.3021	0.1027	0.0000	1.08E-07

89	*	*	0.08	0.000	0.029	0.3021	0.1026	0.0000	1.08E-07
90		*	0.00	1.325	0.000	0.3067	0.1026	0.0000	1.08E-07
91		*	0.00	0.303	0.101	0.3067	0.1026	0.0000	1.08E-07
92			0.00	0.000	0.059	0.3008	0.1025	0.0000	1.08E-07
93			0.21	0.047	0.075	0.3100	0.1025	0.0000	1.08E-07
94			0.00	0.000	0.068	0.3031	0.1025	0.0000	1.08E-07
95			0.00	0.000	0.075	0.2956	0.1025	0.0000	1.08E-07
96			0.04	0.000	0.108	0.2885	0.1024	0.0000	1.08E-07
97			0.02	0.000	0.046	0.2861	0.1024	0.0000	1.08E-07
98			0.54	0.308	0.084	0.3013	0.1024	0.0000	1.08E-07
99			0.17	0.008	0.130	0.3047	0.1023	0.0000	1.08E-07
100			0.00	0.000	0.035	0.3012	0.1023	0.0000	1.08E-07
101			0.00	0.000	0.110	0.2902	0.1023	0.0000	1.08E-07
102			0.00	0.000	0.079	0.2823	0.1022	0.0000	1.08E-07
103			0.00	0.000	0.042	0.2780	0.1022	0.0000	1.07E-07
104			0.59	0.354	0.083	0.2935	0.1022	0.0000	1.07E-07
105			0.15	0.001	0.110	0.2975	0.1022	0.0000	1.07E-07
106			0.43	0.178	0.174	0.3055	0.1021	0.0000	1.07E-07
107			0.00	0.000	0.100	0.2955	0.1021	0.0000	1.07E-07
108			0.00	0.000	0.046	0.2909	0.1021	0.0000	1.07E-07
109			0.00	0.000	0.120	0.2788	0.1020	0.0000	1.07E-07
110			0.08	0.000	0.063	0.2806	0.1020	0.0000	1.07E-07
111			1.03	0.828	0.072	0.2937	0.1020	0.0000	1.07E-07
112			0.00	0.000	0.057	0.2881	0.1019	0.0000	1.07E-07
113			0.00	0.000	0.083	0.2798	0.1019	0.0000	1.07E-07
114			0.22	0.036	0.127	0.2857	0.1019	0.0000	1.07E-07
115			0.18	0.012	0.079	0.2942	0.1019	0.0000	1.07E-07
116			0.59	0.335	0.141	0.3057	0.1018	0.0000	1.07E-07
117			0.01	0.000	0.038	0.3032	0.1018	0.0000	1.07E-07
118			0.06	0.000	0.057	0.3034	0.1018	0.0000	1.07E-07
119			0.00	0.000	0.064	0.2970	0.1017	0.0000	1.07E-07
120			0.56	0.226	0.196	0.3110	0.1017	0.0000	1.07E-07

121	0.21	0.041	0.119	0.3157	0.1017	0.0000	1.07E-07
122	0.08	0.000	0.088	0.3145	0.1016	0.0000	1.07E-07
123	0.29	0.112	0.115	0.3207	0.1016	0.0000	1.07E-07
124	0.19	0.025	0.160	0.3214	0.1016	0.0000	1.07E-07
125	0.70	0.457	0.159	0.3302	0.1016	0.0000	1.07E-07
126	0.22	0.061	0.107	0.3359	0.1015	0.0000	1.07E-07
127	0.19	0.039	0.163	0.3344	0.1015	0.0000	1.07E-07
128	2.68	2.367	0.185	0.3471	0.1015	0.0000	1.07E-07
129	0.00	0.000	0.100	0.3371	0.1014	0.0000	1.07E-07
130	0.52	0.291	0.214	0.3389	0.1014	0.0000	1.07E-07
131	0.18	0.024	0.189	0.3357	0.1014	0.0000	1.07E-07
132	0.00	0.000	0.163	0.3194	0.1014	0.0000	1.07E-07
133	0.00	0.000	0.173	0.3021	0.1013	0.0000	1.07E-07
134	0.00	0.000	0.200	0.2821	0.1013	0.0000	1.07E-07
135	0.12	0.000	0.086	0.2856	0.1013	0.0000	1.07E-07
136	1.00	0.784	0.098	0.2975	0.1012	0.0000	1.07E-07
137	0.00	0.000	0.035	0.2941	0.1012	0.0000	1.07E-07
138	0.78	0.409	0.241	0.3074	0.1012	0.0000	1.06E-07
139	0.04	0.000	0.146	0.2969	0.1011	0.0000	1.06E-07
140	0.27	0.077	0.184	0.2976	0.1011	0.0000	1.06E-07
141	0.07	0.000	0.131	0.2910	0.1011	0.0000	1.06E-07
142	0.00	0.000	0.105	0.2805	0.1011	0.0000	1.06E-07
143	0.34	0.138	0.097	0.2912	0.1010	0.0000	1.06E-07
144	0.05	0.000	0.119	0.2847	0.1010	0.0000	1.06E-07
145	0.00	0.000	0.040	0.2807	0.1010	0.0000	1.06E-07
146	0.00	0.000	0.027	0.2780	0.1009	0.0000	1.06E-07
147	0.61	0.303	0.177	0.2909	0.1009	0.0000	1.06E-07
148	1.07	0.842	0.113	0.3023	0.1009	0.0000	1.06E-07
149	0.00	0.000	0.077	0.2946	0.1008	0.0000	1.06E-07
150	0.00	0.000	0.061	0.2885	0.1008	0.0000	1.06E-07
151	0.00	0.000	0.074	0.2811	0.1008	0.0000	1.06E-07
152	0.00	0.000	0.036	0.2775	0.1008	0.0000	1.06E-07

153	0.00	0.000	0.004	0.2771	0.1007	0.0000	1.06E-07
154	0.00	0.000	0.001	0.2770	0.1007	0.0000	1.06E-07
155	0.61	0.367	0.085	0.2925	0.1007	0.0000	1.06E-07
156	1.23	0.873	0.246	0.3038	0.1006	0.0000	1.06E-07
157	0.01	0.000	0.093	0.2956	0.1006	0.0000	1.06E-07
158	0.33	0.134	0.168	0.2981	0.1006	0.0000	1.06E-07
159	0.03	0.000	0.073	0.2936	0.1006	0.0000	1.06E-07
160	0.00	0.000	0.122	0.2815	0.1005	0.0000	1.06E-07
161	0.00	0.000	0.041	0.2774	0.1005	0.0000	1.06E-07
162	0.21	0.033	0.073	0.2881	0.1005	0.0000	1.06E-07
163	0.09	0.000	0.058	0.2918	0.1004	0.0000	1.06E-07
164	0.56	0.362	0.080	0.3039	0.1004	0.0000	1.06E-07
165	0.00	0.000	0.104	0.2934	0.1004	0.0000	1.06E-07
166	0.00	0.000	0.104	0.2831	0.1003	0.0000	1.06E-07
167	0.00	0.000	0.050	0.2780	0.1003	0.0000	1.06E-07
168	0.00	0.000	0.008	0.2773	0.1003	0.0000	1.06E-07
169	0.21	0.034	0.064	0.2888	0.1003	0.0000	1.06E-07
170	0.00	0.000	0.020	0.2868	0.1002	0.0000	1.06E-07
171	0.33	0.122	0.079	0.3002	0.1002	0.0000	1.06E-07
172	0.30	0.115	0.133	0.3057	0.1002	0.0000	1.06E-07
173	0.00	0.000	0.120	0.2937	0.1001	0.0000	1.06E-07
174	0.00	0.000	0.091	0.2846	0.1001	0.0000	1.05E-07
175	0.76	0.499	0.110	0.2995	0.1001	0.0000	1.05E-07
176	0.00	0.000	0.147	0.2847	0.1001	0.0000	1.05E-07
177	0.00	0.000	0.045	0.2802	0.1000	0.0000	1.05E-07
178	0.10	0.000	0.069	0.2837	0.1000	0.0000	1.05E-07
179	0.00	0.000	0.021	0.2816	0.1000	0.0000	1.05E-07
180	1.00	0.782	0.077	0.2953	0.0999	0.0000	1.05E-07
181	0.00	0.000	0.093	0.2860	0.0999	0.0000	1.05E-07
182	1.50	1.256	0.098	0.3007	0.0999	0.0000	1.05E-07
183	0.04	0.000	0.070	0.2973	0.0999	0.0000	1.05E-07
184	0.00	0.000	0.046	0.2927	0.0998	0.0000	1.05E-07

185	0.00	0.000	0.113	0.2813	0.0998	0.0000	1.05E-07
186	0.00	0.000	0.036	0.2778	0.0998	0.0000	1.05E-07
187	0.00	0.000	0.006	0.2772	0.0997	0.0000	1.05E-07
188	0.00	0.000	0.001	0.2770	0.0997	0.0000	1.05E-07
189	0.00	0.000	0.000	0.2770	0.0997	0.0000	1.05E-07
190	0.00	0.000	0.000	0.2770	0.0996	0.0000	1.05E-07
191	0.00	0.000	0.000	0.2770	0.0996	0.0000	1.05E-07
192	0.05	0.000	0.035	0.2790	0.0996	0.0000	1.05E-07
193	0.03	0.000	0.024	0.2792	0.0996	0.0000	1.05E-07
194	0.00	0.000	0.004	0.2788	0.0995	0.0000	1.05E-07
195	0.00	0.000	0.008	0.2781	0.0995	0.0000	1.05E-07
196	0.00	0.000	0.007	0.2773	0.0995	0.0000	1.05E-07
197	0.01	0.000	0.018	0.2771	0.0994	0.0000	1.05E-07
198	0.52	0.304	0.072	0.2915	0.0994	0.0000	1.05E-07
199	0.49	0.315	0.065	0.3028	0.0994	0.0000	1.05E-07
200	0.00	0.000	0.106	0.2922	0.0994	0.0000	1.05E-07
201	0.00	0.000	0.092	0.2830	0.0993	0.0000	1.05E-07
202	0.00	0.000	0.054	0.2776	0.0993	0.0000	1.05E-07
203	0.00	0.000	0.004	0.2771	0.0993	0.0000	1.05E-07
204	0.00	0.000	0.001	0.2770	0.0992	0.0000	1.05E-07
205	0.17	0.000	0.047	0.2888	0.0992	0.0000	1.05E-07
206	1.40	1.197	0.083	0.3008	0.0992	0.0000	1.05E-07
207	0.00	0.000	0.028	0.2982	0.0992	0.0000	1.05E-07
208	0.69	0.421	0.130	0.3124	0.0991	0.0000	1.05E-07
209	0.00	0.000	0.149	0.2976	0.0991	0.0000	1.05E-07
210	0.05	0.000	0.165	0.2860	0.0991	0.0000	1.04E-07
211	0.03	0.000	0.100	0.2790	0.0990	0.0000	1.04E-07
212	0.00	0.000	0.015	0.2775	0.0990	0.0000	1.04E-07
213	0.00	0.000	0.004	0.2771	0.0990	0.0000	1.04E-07
214	0.00	0.000	0.002	0.2770	0.0990	0.0000	1.04E-07
215	0.00	0.000	0.000	0.2770	0.0989	0.0000	1.04E-07
216	0.00	0.000	0.000	0.2770	0.0989	0.0000	1.04E-07

217	0.00	0.000	0.000	0.2770	0.0989	0.0000	1.04E-07
218	0.01	0.000	0.007	0.2770	0.0988	0.0000	1.04E-07
219	0.00	0.000	0.000	0.2770	0.0988	0.0000	1.04E-07
220	0.01	0.000	0.009	0.2770	0.0988	0.0000	1.04E-07
221	0.00	0.000	0.000	0.2770	0.0988	0.0000	1.04E-07
222	0.00	0.000	0.000	0.2770	0.0987	0.0000	1.04E-07
223	0.00	0.000	0.000	0.2770	0.0987	0.0000	1.04E-07
224	0.00	0.000	0.000	0.2770	0.0987	0.0000	1.04E-07
225	0.00	0.000	0.000	0.2770	0.0986	0.0000	1.04E-07
226	0.00	0.000	0.000	0.2770	0.0986	0.0000	1.04E-07
227	0.00	0.000	0.000	0.2770	0.0986	0.0000	1.04E-07
228	0.00	0.000	0.000	0.2770	0.0986	0.0000	1.04E-07
229	0.00	0.000	0.000	0.2770	0.0985	0.0000	1.04E-07
230	0.00	0.000	0.000	0.2770	0.0985	0.0000	1.04E-07
231	0.00	0.000	0.000	0.2770	0.0985	0.0000	1.04E-07
232	0.56	0.339	0.065	0.2921	0.0984	0.0000	1.04E-07
233	0.00	0.000	0.010	0.2911	0.0984	0.0000	1.04E-07
234	0.02	0.000	0.041	0.2894	0.0984	0.0000	1.04E-07
235	0.00	0.000	0.016	0.2878	0.0984	0.0000	1.04E-07
236	0.00	0.000	0.019	0.2858	0.0983	0.0000	1.04E-07
237	0.00	0.000	0.015	0.2843	0.0983	0.0000	1.04E-07
238	0.38	0.179	0.070	0.2978	0.0983	0.0000	1.04E-07
239	0.05	0.000	0.049	0.2976	0.0982	0.0000	1.04E-07
240	0.37	0.183	0.067	0.3095	0.0982	0.0000	1.04E-07
241	0.00	0.000	0.166	0.2928	0.0982	0.0000	1.04E-07
242	0.29	0.102	0.069	0.3045	0.0982	0.0000	1.04E-07
243	0.01	0.000	0.177	0.2874	0.0981	0.0000	1.04E-07
244	0.91	0.691	0.081	0.3013	0.0981	0.0000	1.04E-07
245	0.00	0.000	0.061	0.2953	0.0981	0.0000	1.04E-07
246	0.74	0.475	0.122	0.3091	0.0980	0.0000	1.03E-07
247	0.00	0.000	0.049	0.3042	0.0980	0.0000	1.03E-07
248	0.00	0.000	0.089	0.2953	0.0980	0.0000	1.03E-07

249	0.07	0.000	0.071	0.2948	0.0980	0.0000	1.03E-07
250	0.04	0.000	0.122	0.2869	0.0979	0.0000	1.03E-07
251	0.00	0.000	0.067	0.2802	0.0979	0.0000	1.03E-07
252	0.00	0.000	0.023	0.2779	0.0979	0.0000	1.03E-07
253	0.00	0.000	0.007	0.2772	0.0979	0.0000	1.03E-07
254	0.01	0.000	0.011	0.2770	0.0980	0.0000	1.03E-07
255	0.00	0.000	0.000	0.2770	0.0980	0.0000	1.03E-07
256	0.18	0.001	0.060	0.2890	0.0980	0.0000	1.03E-07
257	0.00	0.000	0.017	0.2873	0.0979	0.0000	1.03E-07
258	0.00	0.000	0.021	0.2851	0.0979	0.0000	1.03E-07
259	0.00	0.000	0.024	0.2828	0.0979	0.0000	1.03E-07
260	0.00	0.000	0.022	0.2806	0.0979	0.0000	1.03E-07
261	0.00	0.000	0.018	0.2788	0.0978	0.0000	1.03E-07
262	0.48	0.265	0.067	0.2934	0.0978	0.0000	1.03E-07
263	0.13	0.000	0.070	0.2995	0.0978	0.0000	1.03E-07
264	0.50	0.286	0.087	0.3123	0.0977	0.0000	1.03E-07
265	0.00	0.000	0.091	0.3032	0.0977	0.0000	1.03E-07
266	0.00	0.000	0.041	0.2991	0.0977	0.0000	1.03E-07
267	0.00	0.000	0.158	0.2834	0.0977	0.0000	1.03E-07
268	0.00	0.000	0.048	0.2786	0.0976	0.0000	1.03E-07
269	0.45	0.217	0.101	0.2918	0.0976	0.0000	1.03E-07
270	0.00	0.000	0.063	0.2855	0.0976	0.0000	1.03E-07
271	0.00	0.000	0.060	0.2795	0.0975	0.0000	1.03E-07
272	0.00	0.000	0.020	0.2775	0.0975	0.0000	1.03E-07
273	0.00	0.000	0.004	0.2771	0.0975	0.0000	1.03E-07
274	0.00	0.000	0.001	0.2770	0.0975	0.0000	1.03E-07
275	0.00	0.000	0.000	0.2770	0.0974	0.0000	1.03E-07
276	0.32	0.135	0.053	0.2897	0.0974	0.0000	1.03E-07
277	0.16	0.001	0.055	0.3003	0.0974	0.0000	1.03E-07
278	0.00	0.000	0.011	0.2992	0.0973	0.0000	1.03E-07
279	0.00	0.000	0.055	0.2938	0.0973	0.0000	1.03E-07
280	0.00	0.000	0.024	0.2914	0.0973	0.0000	1.03E-07

281		0.00	0.000	0.014	0.2900	0.0973	0.0000	1.03E-07
282		0.00	0.000	0.029	0.2871	0.0972	0.0000	1.03E-07
283		0.00	0.000	0.024	0.2847	0.0972	0.0000	1.03E-07
284		0.00	0.000	0.021	0.2826	0.0972	0.0000	1.03E-07
285		0.00	0.000	0.016	0.2810	0.0971	0.0000	1.03E-07
286		0.06	0.000	0.054	0.2815	0.0971	0.0000	1.03E-07
287	*	0.02	0.000	0.030	0.2806	0.0971	0.0000	1.03E-07
288	*	0.00	0.000	0.000	0.2806	0.0971	0.0000	1.03E-07
289	*	0.00	0.000	0.000	0.2806	0.0970	0.0000	1.03E-07
290		0.00	0.000	0.014	0.2792	0.0970	0.0000	1.02E-07
291	*	0.00	0.000	0.007	0.2785	0.0970	0.0000	1.02E-07
292	*	0.00	0.000	0.004	0.2781	0.0969	0.0000	1.02E-07
293		0.54	0.328	0.063	0.2934	0.0969	0.0000	1.02E-07
294		0.00	0.000	0.024	0.2909	0.0969	0.0000	1.02E-07
295		0.00	0.000	0.013	0.2896	0.0969	0.0000	1.02E-07
296		0.00	0.000	0.012	0.2884	0.0968	0.0000	1.02E-07
297		0.00	0.000	0.012	0.2872	0.0968	0.0000	1.02E-07
298		0.00	0.000	0.011	0.2860	0.0968	0.0000	1.02E-07
299		0.00	0.000	0.011	0.2850	0.0967	0.0000	1.02E-07
300		0.00	0.000	0.011	0.2839	0.0967	0.0000	1.02E-07
301		0.00	0.000	0.010	0.2829	0.0967	0.0000	1.02E-07
302		0.00	0.000	0.010	0.2819	0.0967	0.0000	1.02E-07
303	*	1.24	0.000	0.039	0.2839	0.0966	0.0000	1.02E-07
304		0.00	0.855	0.000	0.2977	0.0966	0.0000	1.02E-07
305		0.01	0.005	0.085	0.3087	0.0966	0.0000	1.02E-07
306	*	0.19	0.000	0.058	0.3107	0.0965	0.0000	1.02E-07
307	*	0.00	0.000	0.023	0.3127	0.0965	0.0000	1.02E-07
308		0.45	0.388	0.001	0.3254	0.0965	0.0000	1.02E-07
309		0.12	0.008	0.053	0.3316	0.0965	0.0000	1.02E-07
310		0.03	0.000	0.041	0.3306	0.0964	0.0000	1.02E-07
311		1.30	1.117	0.057	0.3437	0.0964	0.0000	1.02E-07
312		0.08	0.002	0.047	0.3466	0.0964	0.0000	1.02E-07

313		0.00	0.000	0.022	0.3443	0.0964	0.0000	1.02E-07
314		0.00	0.000	0.023	0.3420	0.0963	0.0000	1.02E-07
315		0.00	0.000	0.024	0.3396	0.0963	0.0000	1.02E-07
316		0.00	0.000	0.065	0.3331	0.0963	0.0000	1.02E-07
317		0.00	0.000	0.056	0.3275	0.0962	0.0000	1.02E-07
318		0.00	0.000	0.050	0.3225	0.0962	0.0000	1.02E-07
319		0.03	0.000	0.083	0.3176	0.0962	0.0000	1.02E-07
320		0.00	0.000	0.055	0.3120	0.0962	0.0000	1.02E-07
321		0.22	0.046	0.060	0.3233	0.0961	0.0000	1.02E-07
322		0.04	0.000	0.049	0.3222	0.0961	0.0000	1.02E-07
323		0.02	0.000	0.035	0.3204	0.0963	0.0000	1.02E-07
324	*	0.01	0.000	0.019	0.3194	0.0963	0.0000	1.02E-07
325		0.00	0.000	0.019	0.3174	0.0963	0.0000	1.02E-07
326		0.00	0.000	0.039	0.3136	0.0962	0.0000	1.02E-07
327		0.00	0.000	0.040	0.3095	0.0962	0.0000	1.02E-07
328		0.00	0.000	0.045	0.3050	0.0962	0.0000	1.02E-07
329		0.17	0.001	0.139	0.3076	0.0962	0.0000	1.02E-07
330		0.28	0.098	0.061	0.3196	0.0961	0.0000	1.02E-07
331		0.00	0.000	0.067	0.3129	0.0961	0.0000	1.02E-07
332		0.00	0.000	0.023	0.3107	0.0961	0.0000	1.02E-07
333		0.00	0.000	0.047	0.3060	0.0960	0.0000	1.02E-07
334		0.03	0.000	0.049	0.3038	0.0960	0.0000	1.02E-07
335		0.00	0.000	0.017	0.3021	0.0960	0.0000	1.02E-07
336		0.00	0.000	0.015	0.3006	0.0960	0.0000	1.01E-07
337		0.00	0.000	0.018	0.2989	0.0959	0.0000	1.01E-07
338		0.00	0.000	0.011	0.2978	0.0959	0.0000	1.01E-07
339	*	0.00	0.000	0.013	0.2965	0.0959	0.0000	1.01E-07
340	*	0.00	0.000	0.000	0.2965	0.0959	0.0000	1.01E-07
341	*	0.00	0.000	0.012	0.2953	0.0958	0.0000	1.01E-07
342	*	0.00	0.000	0.008	0.2945	0.0958	0.0000	1.01E-07
343		0.00	0.000	0.015	0.2930	0.0958	0.0000	1.01E-07
344		0.00	0.000	0.018	0.2912	0.0957	0.0000	1.01E-07

345		0.00	0.000	0.021	0.2891	0.0957	0.0000	1.01E-07
346		0.00	0.000	0.020	0.2872	0.0957	0.0000	1.01E-07
347		0.00	0.000	0.019	0.2852	0.0957	0.0000	1.01E-07
348		0.00	0.000	0.017	0.2836	0.0956	0.0000	1.01E-07
349		0.00	0.000	0.011	0.2825	0.0956	0.0000	1.01E-07
350	*	0.00	0.000	0.013	0.2812	0.0956	0.0000	1.01E-07
351		0.00	0.000	0.026	0.2786	0.0955	0.0000	1.01E-07
352		0.00	0.000	0.013	0.2773	0.0955	0.0000	1.01E-07
353		0.27	0.093	0.057	0.2895	0.0955	0.0000	1.01E-07
354		0.00	0.000	0.007	0.2887	0.0955	0.0000	1.01E-07
355		0.00	0.000	0.015	0.2872	0.0954	0.0000	1.01E-07
356		0.00	0.000	0.034	0.2838	0.0954	0.0000	1.01E-07
357		0.00	0.000	0.024	0.2814	0.0954	0.0000	1.01E-07
358		0.00	0.000	0.024	0.2790	0.0953	0.0000	1.01E-07
359		0.00	0.000	0.015	0.2774	0.0953	0.0000	1.01E-07
360		0.00	0.000	0.004	0.2771	0.0953	0.0000	1.01E-07
361		0.00	0.000	0.001	0.2770	0.0953	0.0000	1.01E-07
362		0.58	0.359	0.068	0.2928	0.0952	0.0000	1.01E-07
363		0.00	0.000	0.009	0.2919	0.0952	0.0000	1.01E-07
364		0.01	0.000	0.025	0.2907	0.0952	0.0000	1.01E-07
365		0.00	0.000	0.029	0.2879	0.0952	0.0000	1.01E-07

* = Frozen (air or soil)

Annual Totals for Year 30			
	inches	cubic feet	percent
Precipitation	45.52	165,241.2	100.00
Runoff	27.288	99,054.9	59.95
Evapotranspiration	18.379	66,715.3	40.37
Recirculation into Layer 1	0.0041	15.0	0.01
Drainage Collected from Layer 3	0.0000	0.0000	0.00

Recirculation from Layer 3	0.0041	15.0	0.01
Percolation/Leakage through Layer 5	0.000038	0.1394	0.00
Average Head on Top of Layer 4	0.0998	---	---
Change in Water Storage	-0.1458	-529.2	-0.32
Soil Water at Start of Year	1,406.7494	5,106,500.2	3090.33
Soil Water at End of Year	1,406.6036	5,105,971.0	3090.01
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00
Annual Water Budget Balance	-0.0041	-15.0	-0.01

Average Annual Totals Summary

Title: AEL Lateral Expansion
Simulated on: 6/29/2023 9:04

	Average Annual Totals for Years 1 - 30*			
	(inches)	[std dev]	(cubic feet)	(percent)
Precipitation	37.26	[5.79]	135,260.0	100.00
Runoff	22.193	[4.34]	80,560.7	59.56
Evapotranspiration	15.068	[2.294]	54,698.1	40.44
Subprofile1				
Recirculation into Layer 1	0.0086	[0.0078]	31.4	0.02
Lateral drainage collected from Layer 3	0.0000	[0]	0.0000	0.00
Drainage recirculated from Layer 3	0.0086	[0.0078]	31.4	0.02
Percolation/leakage through Layer 5	0.000073	[0.000061]	0.2664	0.00
Average Head on Top of Layer 4	0.2087	[0.1873]	---	---
Water storage				
Change in water storage	0.0003	[0.4116]	0.9824	0.00

* Note: Average inches are converted to volume based on the user-specified area.

Peak Values Summary

Title: AEL Lateral Expansion
Simulated on: 6/29/2023 9:04

	Peak Values for Years 1 - 30*		
	(inches)		(cubic feet)
Precipitation	4.75		17,255.9
Runoff	5.591		20,293.8
Subprofile1			
Drainage Recirculated into Layer 1	0.0001		0.2881
Drainage collected from Layer 3	0.0000		0.0000
Drainage recirculated from Layer 3	0.0001		0.2881
Percolation/leakage through Layer 5	0.000001		0.0023
Average head on Layer 4	0.7000		---
Maximum head on Layer 4	1.1774		---
Location of maximum head in Layer 3	39.74	(feet from drain)	
Other Parameters			
Snow water	2.9391		10,668.9
Maximum vegetation soil water	0.4273	(vol/vol)	
Minimum vegetation soil water	0.2770	(vol/vol)	

Final Water Storage in Landfill Profile at End of Simulation Period

Title: AEL Lateral Expansion
Simulated on: 6/29/2023 9:04
Simulation period: 30 years

	Final Water Storage	
Layer	(inches)	(vol/vol)
1	3.6646	0.3054
2	1,391.0880	0.2920
3	1.6030	0.1336
4	0.0000	0.0000
5	10.2480	0.4270
Snow water	0.0000	---