

**TITLE 252. DEPARTMENT OF ENVIRONMENTAL QUALITY
CHAPTER 690. WATER QUALITY STANDARDS IMPLEMENTATION**

SUBCHAPTER 1. INTRODUCTION

252:690-1-1. Purpose and applicability

This Chapter establishes guidance and requirements for DEQ jurisdictional areas for the implementation of Oklahoma's Water Quality Standards, found at OAC ~~785:45~~252:730, pursuant to 27A O.S. § 1-1-202(B). The DEQ's Water Quality Standards Implementation Plan is included as Appendix A. Included in Subchapter 3 of this Chapter are certain point source discharge implementation criteria formerly contained in OAC ~~785:46~~252:740. In addition, the applicable implementation provisions of the following DEQ rules apply:

- (1) OAC 252:205, "Hazardous Waste Management;"
- (2) OAC 252:220, "Brownfields;"
- (3) OAC 252:301, "Laboratory Accreditation;"
- (4) OAC 252:410, "Radiation Management;"
- (5) OAC 252:515, "Management of Solid Waste;"
- (6) OAC 252:606, "Discharge Standards;"
- (7) OAC 252:611, "General Water Quality;"
- (8) OAC 252:616, "Industrial Wastewater Systems;"
- (9) OAC 252:619, "Operation and Maintenance of Non-Industrial Total Retention Lagoon Systems and Land Application;"
- (10) OAC 252:621, "Non-Industrial Flow-Through and Public Water Supply Impoundments Including Land Application;"
- (11) OAC 252:626, "Public Water Supply Construction Standards;"
- (12) OAC 252:631, "Public Water Supply Operation;"
- (13) OAC 252:641, "Individual and Small Public On-Site Sewage Treatment Systems;"
- (14) OAC 252:652, "Underground Injection Control;"
- (15) OAC 252:656, "Water Pollution Control Facility Construction;" and
- (16) OAC 252:710, "Waterworks and Wastewater Works Operator Certification."

252:690-1-2. Definitions

The following words or terms, when used in this Chapter, shall have the following meaning, unless the context clearly indicates otherwise:

"Acute WET testing" means WET testing which measures short-term lethality to a specific aquatic animal test species as specified in OAC 252:690-3-29.

"Arithmetic mean" means the sum of the values of individual data points in a data set divided by the number of data points. This term is synonymous with arithmetic average.

"Background concentration" means the concentration of a substance in receiving water immediately upstream of, but not influenced by, a wastewater discharge.

"CAFO" means Concentrated Animal Feeding Operation.

"Chronic WET testing" means WET testing which measures long term lethal and sublethal effects to a specific aquatic animal test species as specified in OAC 252:690-3-29.

"Coefficient of variation (CV)" means, when used in the context of effluent data, the measure

of an effluent distribution's variation relative to its mean. When used in the context of WET test acceptability, CV means the % variation among test replicates in either the control or the critical dilution.

"Conservative substance" means a substance which persists in the environment, having characteristics which are resistant to ordinary biological or biochemical degradation.

"Critical dilution" means an effluent dilution, expressed as a percentage, representative of the dilution afforded a wastewater discharge according to the appropriate Q*-dependent chronic mixing zone equation for chronic WET testing. The critical dilution for acute WET testing is 100%.

"Defensible analytical data" means data traceable to a laboratory certified for that pollutant by-DEQ under OAC 252:301 or data accepted by EPA; data traceable to a municipal laboratory operated by a properly certified laboratory technician by OAC 252:710; or data generated by a state or federal agency laboratory with equivalent certification. Quality assurance procedures, including chain of custody records, shall be adequate and documentable. Quality control data required in the analytical method shall be available from the laboratory upon request.

"DEQ" means the Oklahoma Department of Environmental Quality.

"Detectable concentration" means a concentration greater than zero (0) using a ninety-nine percent (99%) probability basis.

"Dilution series" means a set of proportional effluent dilutions for acute or chronic WET testing based on a specified critical dilution, which is typically the next-to-highest dilution in the series.

"Effluent-dominated receiving stream" means a stream which receives a point source discharge greater than or equal to one-third (1/3) of its 7Q2 flow.

"Engineer" means professional engineer registered in the State of Oklahoma.

"EPA" means the United States Environmental Protection Agency.

"Geometric mean" means the antilog of the arithmetic average of the natural logarithms of the individual points in a data set.

"Intermittent toxicity" means two or more lethal or sublethal effect test failures of a routine acute or chronic WET test within any 18-month period.

"LC₅₀ (lethal concentration)" means the concentration of a toxicant in an external medium that is lethal to fifty percent of the test animals for a specified period of exposure.

"Life of the permit" means a specific time frame from the date of the issuance of a permit until a new or renewed permit is issued.

"Load Allocation or LA" means the portion of a receiving water's TMDL that is attributed either to one of its existing or future nonpoint sources or to natural background sources.

"Log transformation" means the mathematical transformation of an observed data set which results in a data set consisting of the natural logarithms of the individual data points in the observed data set.

"Log-normally distributed" means a distribution of effluent data which is positively skewed.

"Major discharger" means an industrial facility which has a point rating greater than or equal to 80 according to the NPDES permit rating system for industrial discharges; a POTW with a design flow greater than or equal to 1 mgd; or any facility designated as such by EPA in conjunction with the state permitting authority.

"Mineral constituents" means chlorides, sulfates and total dissolved solids collectively.

"Measurable level" means a detectable concentration for which the analytical signal to noise ratio is significantly high to report a reliable single number. The measurable level corresponds to

the lowest point at which the analytical calibration curve is determined based on analyses for the pollutant of concern.

"Municipal" means a publicly owned treatment works or facilities which are privately owned that generate only domestic waste including mobile home parks, home owner's associations, etc.

"Narrative water quality criterion" means statements or other qualitative expressions of chemical, physical, or biological parameters that are assigned to protect a beneficial use.

"Numerical water quality criterion" means concentrations or other quantitative measures of chemical, physical, or biological parameters that are assigned to protect a beneficial use.

"No Observed Effect Concentration-Lethal" or **"NOEC_L"** means the greatest tested effluent dilution in a WET test at and below which lethality to test organisms does not occur that is statistically different from the control (0% effluent) at the 95% confidence level.

"No Observed Effect Concentration-Sublethal" or **"NOEC_s"** means the greatest tested effluent dilution in a WET test at and below which a sublethal effect to test organisms does not occur that is statistically different from the control (0% effluent) at the 95% confidence level.

"Non-conservative substance" means a substance which undergoes significant short-term degradation or change in the environment other than by dilution.

"OAC" means Oklahoma Administrative Code.

"Once-through cooling water" means cooling water that is not recirculated.

"OWQS" means the Oklahoma Water Quality Standards, contained at OAC 785:45252:730.

"Permit cycle" means the life of a permit from the date of issuance to the date of expiration as specifically stated on a permit, unless the expiration of the permit is extended by operation of statute, rule or agreement of the permittee and DEQ.

"Period of Record" means a continuous period for which a facility's effluent data is reviewed for the purposes of characterizing the effluent.

"Persistent toxicity" means the repeated failure of an acute or chronic WET test. If the required WET testing frequency is monthly, repeated failure occurs upon the failure of two of the three consecutive monthly tests for the same test species. If the required WET testing frequency is other than monthly, repeated failure occurs upon the failure of the required test plus one of the two monthly retests for the same test species in the ensuing two-month period.

"Percent mortality" means 100% minus percent survival in a WET test effluent dilution.

"Positively skewed" means a data distribution which is asymmetric about its arithmetic mean with a tail in the positive direction.

"POTW" means ~~publically~~ publicly owned treatment works.

"Reasonable potential" means causes, or has a reasonable potential to cause or contribute to an exceedance of a water quality criterion.

"Robust Regression on Order Statistics (Robust ROS)" means a statistical method that computes a regression line to estimate values for non-detect data and combines these estimates with detected observations to compute sample statistics.

"RPF₉₅" means the reasonable potential factor for an effluent distribution, based on a 95% probability basis, for the purpose of determining whether an effluent limitation is required.

"RPF_{95(M)}" means the reasonable potential factor for an effluent distribution, based on a 95% confidence interval and 95% probability basis, and accounting for the size of the effluent data set, for the purpose of determining whether further effluent monitoring is required.

"Receiving water" means the water of the State to which a wastewater is discharged.

"Regulatory effluent flow" means the effluent flow, which is water quality criterion-dependent, used in determining reasonable potential and wasteload allocations for a substance.

"SMCRA" means the Surface Mining Control and Reclamation Act of 1977.

"Standard deviation (s_x)" means the standard deviation of an untransformed data set based on a sample of size N.

"Standard deviation of log-transformed x ($s_{\ln(x)}$)" means the standard deviation of a log-normally transformed data set based on a sample of size N.

"Sublethal test failure" means the statistically significant difference (at the 95% confidence level) between reproduction or growth of the test organism at or below the chronic critical dilution after completion of an EPA approved chronic test method.

" T_{95} " means the 95th percentile of the effluent temperature distribution (in °C) of sustained two-hour daily maximum effluent temperatures where effluent temperature is recorded continuously and the distribution of daily maximum effluent temperatures where temperature is recorded at discrete intervals of two hours or longer, provided that recording intervals for temperature do not exceed six hours.

"TDS" means total dissolved solids.

"TIE" means toxicity identification evaluation.

"TRE" means toxicity reduction evaluation.

"Trigger Background concentration" means the background concentration necessary to trigger reasonable potential for a substance to exceed an applicable criterion given a specified mean effluent concentration.

"Wasteload allocation" or "WLA" means the portion of a receiving water's TMDL that is allocated to one of its existing or future point sources of pollution.

"WET limit" means a WET testing limitation in the form of a $NOEC_L$, $NOEC_s$, or LC_{50} , the exceedance of which constitutes a permit violation.

"WET testing" means testing for whole effluent toxicity:

- (A) using an effluent dilution series based on a critical dilution,
- (B) with a specific aquatic animal species, and
- (C) utilizing EPA-approved testing methods.

252:690-1-3. Technical Acronyms

The following technical acronyms, when used in this Chapter, shall have the following meaning:

" ΔT_{max} " means the maximum temperature increase in °C at the edge of the temperature mixing zone.

"7Q2" means the 7 day low flow of a stream likely to occur with a 50% probability each year. The procedure for determining a site-specific 7Q2 is described at OAC ~~785:46~~252:740.

"7T2" means the 7 day maximum temperature likely to occur with a 50% probability each year. The procedure for determining a site-specific 7T2 is described at OAC ~~785:46~~252:740.

"ACD" means acute critical dilution.

"BOD₅" means 5-day biochemical oxygen demand.

"BT/C ratio" means the ratio of trigger background concentration to associated water quality criterion.

"(BT/C)_{max}" means the maximum BT/C ratio for a given criterion for which background monitoring is required as a permit condition.

" C_{95} " means the 95th percentile maximum likelihood effluent concentration of a substance. It is the product of $C_{E(mean)}$ and RPF_{95} .

" $C_{95(M)}$ " means the 95th percentile maximum likelihood effluent concentration of a substance,

accounting for the size of the effluent data set. It is the product of $C_{E(max)}$ and $RPF_{95(M)}$.

"**C_A**" means the acute numerical criterion for toxic substances.

"**C_B**" means background concentration.

"**C_C**" means the chronic numerical criterion for toxic substances.

"**C_d**" means the instream concentration of a substance resulting from a wastewater discharge.

"**C_{d(A)}**" means the instream concentration of a substance as determined by the acute mixing equation.

"**C_{d(c)}**" means the maximum instream concentration of a substance at the edge of the chronic mixing zone.

"**C_{d(FF)}**" means the instream concentration of a substance after complete mixing, as applied to determination of reasonable potential to exceed a human health criterion for the consumption of fish flesh.

"**C_{d(FFW)}**" means the instream concentration of a substance after complete mixing, as applied to determination of reasonable potential to exceed a human health criterion for the consumption of fish flesh and water.

"**C_{d(NRWQC)}**" means the instream concentration of a substance after complete mixing, as applied to determination of reasonable potential to exceed an EPA human health criterion for the consumption of fish flesh.

"**C_{d(RAW)}**" means the instream concentration of a substance after complete mixing, as applied to determination of reasonable potential to exceed a raw water column criterion.

"**C_{d(SS)}**" means the instream concentration of a substance after complete mixing, as applied to determination of reasonable potential to exceed an agriculture sample standard (SS).

"**C_{d(YMS)}**" means the instream concentration of a substance after complete mixing, as applied to determination of reasonable potential to exceed an agriculture yearly mean standard (YMS).

"**C_{E(max)}**" means the maximum concentration of a substance in an effluent data set.

"**C_{E(mean)}**" means mean effluent concentration.

"**C_{FF}**" means the numerical criterion for the protection of human health for the consumption of fish flesh.

"**C_{FFW}**" means the numerical criterion for the protection of human health for the consumption of fish flesh and water.

"**C_{NRWQC}**" means the EPA recommended national water quality criterion for the protection of human health for the consumption of fish flesh.

"**C_{RAW}**" means the numerical criterion for protection of the raw water column.

"**C_{SS}**" means agriculture sample standard numerical criterion, i.e., the historic segment averaged SS value from Appendix F of OAC 785:45252:730, unless data more representative of the receiving stream are available.

"**C_{YMS}**" means agriculture yearly mean standard numerical criterion, i.e., the historic segment averaged YMS value from Appendix F of OAC 785:45252:730, unless data more representative of the receiving stream are available.

"**CBOD₅**" means 5-day carbonaceous biochemical oxygen demand.

"**CCD**" means chronic critical dilution.

"**CPP**" means the Continuing Planning Process document required under Section 303(e) of the Clean Water Act.

"**CWAC**" means cool water aquatic community.

"**D**" means, in the context of a discharge to a lake through a pipe, the pipe diameter in feet.

"**DML**" means daily maximum permit limitation.

"DML_A" means the toxic substance acute criterion DML.
"DML_C" means the toxic substance chronic criterion DML.
"DML_{CL}" means agriculture criterion-based DML for chlorides.
"DML_{FF}" means the human health/fish flesh DML.
"DML_{FFW}" means the human health/fish flesh and water DML.
"DML_{HH}" means human health-based DML.
"DML_{RAW}" means the raw water column DML.
"DML_{SO4}" means agriculture criterion-based DML for sulfates.
"DML_T" means the temperature based DML.
"DML_{TDS}" means agriculture criterion-based DML for total dissolved solids (dried at 180°C).
"DML_{TOX}" means toxic substance-based DML.
"DMR" means Discharge Monitoring Report.
"DO" means dissolved oxygen.
"gpd" means gallons per day.
"HLAC" means habitat-limited aquatic community.
"ICIS" means integrated compliance information system.
"LTA" means long term average.
"LTA_A" means the toxic substance acute numerical criterion LTA.
"LTA_C" means the toxic substance chronic numerical criterion LTA.
"LTA_{FF}" means the fish flesh human health criterion LTA.
"LTA_{FFW}" means the fish flesh and water human health criterion LTA.
"LTA_{RAW}" means the raw water column criterion LTA.
"LTA_{SS}" means the agriculture sample standard LTA.
"LTA_T" means the temperature criterion LTA.
"LTA_{TOX}" means the limiting toxic substance-based LTA, i.e., the smallest of LTA_A or LTA_C, as applicable.
"LTA_{YMS}" means the agriculture yearly mean standard LTA.
"MAL" means monthly average permit limitation.
"MAL_A" means the toxic substance acute criterion MAL.
"MAL_C" means the toxic substance chronic criterion MAL.
"MAL_{CL}" means agriculture criterion-based MAL for chlorides.
"MAL_{FF}" means the human health/fish flesh MAL.
"MAL_{FFW}" means the human health/fish flesh and water MAL.
"MAL_{RAW}" means the raw water column MAL.
"MCL" means maximum contaminant level (when used in the context of primary drinking water standards).
"MAL_{HH}" means human health-based MAL.
"MAL_{SO4}" means agriculture criterion-based MAL for sulfates.
"MAL_T" means temperature MAL.
"MAL_{TDS}" means agriculture criterion-based MAL for total dissolved solids (dried at 180°C).
"MAL_{TOX}" means toxic substance-based MAL.
"mgd" means million gallons per day.
"mg/l" means milligrams per liter.
"MQL" means minimum quantifiable level.
"N" means the number of individual data points, collected over time, in an effluent or background data set.

"**N_m**" means the per month monitoring frequency where a permit limitation is established. When used in the context of temperature limitations, N_m is equal to four times N_w (i.e., $N_m = 4 \times N_w$).

"**N_w**" means the per week monitoring frequency where a temperature permit limitation is established.

"**NRWQC**" means the National Recommended Water Quality Criteria, publication no. EPA 822-Z-99-001, April 1999.

"**PBCR**" means Primary Body Contact Recreation.

"**PCS**" means Permit Compliance System, an EPA database that tracks NPDES permit compliance.

"**Q***" means the ratio of the regulatory effluent flow to the regulatory receiving water flow.

"**Q_e**" means regulatory effluent flow.

"**Q_{e(30)}**" means the Q_e that is the highest monthly average flow over the two year period of record for an industrial facility.

"**Q_{e(D)}**" means the Q_e that is the lesser of the design flow for a municipal POTW or the design flow listed in the Section 208 Areawide Basin Plan.

"**Q_{e(LTA)}**" means the Q_e that is the arithmetic (long term) average flow over the two year period of record for an industrial facility.

"**Q_u**" means regulatory receiving water flow upstream of a point of wastewater discharge.

"**Q_{u(7Q2)}**" means the same as 7Q2.

"**Q_{u(LTA)}**" means the Q_u that is the mean annual (long term) receiving water flow.

"**Q_{u(STA)}**" means the Q_u that is the short term average receiving water flow and is equal to $Q_{u(LTA)} \times 0.68$.

"**SBCR**" means Secondary Body Contact Recreation

"**SNC**" means significant noncompliance.

"**SS**" means sample standard.

"**s.u.**" means standard units for the measurement of pH.

"**T₉₅**" means 95th percentile effluent temperature in °C.

"**T_a**" means regulatory ambient temperature in °C.

"**TBLL**" means technically based local limits

"**TDS**" means total dissolved solids.

"**TIE**" means toxicity identification evaluation.

"**TMDL**" means total maximum daily load.

"**TRC**" means total residual chlorine.

"**TRE**" means toxicity reduction evaluation.

"**TRO**" means total residual (halogenated) oxidants.

"**µg/l**" means micrograms per liter.

"**W**" means, in the context of a discharge to a lake through an open channel (i.e., canal), the channel width in feet.

"**WAL**" means weekly average permit limitation.

"**WAL_T**" means temperature WAL.

"**WET**" means whole effluent toxicity.

"**WLA**" means waste load allocation.

"**WLA_A**" means a toxic substance acute criterion WLA.

"**WLA_C**" means a toxic substance chronic criterion WLA.

"**WLA_{FF}**" means a human health/fish flesh criterion WLA.

"**WLA_{FFW}**" means a human health/fish flesh and water criterion WLA.
"WLA_{RAW}" means a raw water column criterion WLA.
"WLA_{SS}" means an agriculture sample standard WLA.
"WLA_T" means a temperature criterion WLA.
"WLA_{YMS}" means an agriculture yearly mean standard WLA.
"WQMP" means the statewide Section 208 Water Quality Management Plan.
"WWAC" means warm water aquatic community.
"YMS" means yearly mean standard.

252:690-1-6. Relationship to other rules

References are made in these rules to water quality standards, water quality criteria, beneficial uses, antidegradation, and mixing zones. Rules regarding these topics are promulgated by ~~the OWRB~~ DEQ at OAC ~~785:45~~ 252:730, as approved by EPA. References are made in these rules to water quality standards implementation, effluent characterization, reasonable potential, and regulatory receiving stream flows. Rules regarding these topics are promulgated by ~~the OWRB~~ DEQ at OAC ~~785:46~~ 252:740. Provisions in these rules provide additional procedures to implement the ~~OWRB~~ water quality standards, water quality criteria, beneficial uses, antidegradation, and mixing zone rules for regulatory purposes.

SUBCHAPTER 3. POINT SOURCE DISCHARGES

252:690-3-11. Receiving water background characterization requirements

- (a) **Long term average.** Where required, the DEQ will calculate a LTA background level of a substance as a geometric mean unless otherwise specified.
- (b) **Background data sources.** Background data must be defensible analytical data and be representative of the receiving water's current upstream conditions. The DEQ will use data collected and reported in accordance with a background monitoring requirement in a previous permit where available.
- (c) **Unavailability of background data.** Where no background data is available, the background is assumed to be zero.
- (d) **Size of background data set.** At least 10 data points are required for a background data set to be considered complete. The DEQ may use a partial background data set for reasonable potential purposes if the data is the only defensible analytical data available. Where the use of a partial background data set results in demonstration of reasonable potential, the permit will include effluent limitations based on a zero background level, which may have a delayed effective date of no more than two years. The permit will require the permittee to complete the background monitoring, at which time the DEQ will reopen the permit, if necessary, to adjust permit limitations according to the background level determined from a complete background data set.
- (e) **Alternative Method for Determination of 7Q2.**
 - (1) A permittee may use an alternative method for determining a 7Q2 as allowed by OAC ~~785:46~~ 252:740-1-6 (c). The 7Q2 calculated from the historical record may be modified to incorporate anticipated upstream flow releases provided the source of water is owned or controlled by a federal governmental entity and the following information is submitted to the DEQ:
 - (A) a determination that a reliable source of upstream flow exists;

(B) documentation that the upstream source of water:

- (i) includes water quality improvement as an authorized use, or
- (ii) includes allocated storage for water quality improvement;

(C) documentation that the upstream source of water is governed by a water control plan developed and implemented pursuant to 33 CFR § 222.5; and

(D) a demonstration that the alternative 7Q2 is identified in the most recently published State Water Quality Management Plan.

(2) The DEQ will include any approved alternative 7Q2 as a permit limit in any discharge permit. Said limit shall be stated as a minimum daily flow measured at the nearest upstream flow gage.

(3) In the event that the alternative 7Q2 is not consistently attained, the DEQ may re-open the permit and re-calculate the effluent limitations using the actual receiving stream flows.

252:690-3-16. Requirements specific to agriculture criteria

(a) **Historical data.** If site-specific background defensible analytical data is not available, the DEQ will use the YMS and SS criteria in OAC ~~785:452~~252:730, Appendix F, to determine the background concentrations of the mineral constituents. In the absence of listed YMS and SS criteria specific to the receiving water of interest, the segment averaged YMS and SS criteria are used to establish the background concentrations of the mineral constituents. C_B is calculated according to Equation C-11 in Appendix C.

(b) **Site-specific background data available.** Where a site specific background data set of at least 10 data points is available, the DEQ may use the arithmetic average of the site specific background data set instead of a background level determined from the segment-averaged YMS and SS values in OAC ~~785:452~~252:730, Appendix F.

(c) **Background monitoring.** Where agriculture criteria-based limitations are established in a permit, the DEQ may require background monitoring of the limited mineral constituent(s) to determine site-specific conditions.

252:690-3-18. Reasonable potential to exceed narrative toxicity criterion for the Fish and Wildlife Propagation beneficial use utilizing whole effluent toxicity

See OAC ~~785:462~~252:740.

252:690-3-21. Reasonable potential for ammonia

See OAC ~~785:462~~252:740.

252:690-3-26. Monitoring frequencies for ammonia

Where ammonia limits are toxicity-based, permits will require the permittee to monitor ammonia at a frequency of three (3) times per week. At any time during the term of a permit, where the permittee has completed twelve (12) consecutive reporting periods subject to toxicity based ammonia limits where the highest daily maximum concentration did not exceed 1.5 times the toxicity based MAL and there were not ~~exceedences-exceedances~~ of the monthly average or daily maximum limits for ammonia, the permittee may request a reduction of the ammonia monitoring frequency to one (1) time per week. If WET test failures attributable to ammonia are experienced at any time during the term of a permit, or there are ~~exceedences-exceedances~~ of the monthly average limit or daily maximum limit for ammonia, the ammonia monitoring frequency must be continued at or be returned to three (3) times per week. If there are no WET test failures

attributable to ammonia and no ~~exceedences~~ ~~exceedances~~ of either the monthly average limit or the daily maximum limit for ammonia following a reduction of the monitoring frequency for toxicity-based ammonia limits to one (1) time per week, the reduced ammonia monitoring frequency may be continued in the ensuing permit cycle. This paragraph does not apply to ammonia monitoring required to be performed concurrently with WET testing.

252:690-3-40. Endpoint and test failure criteria for chronic tests

The endpoint for lethality for chronic WET testing and retesting is the NOEC_L. The endpoint for sublethality for routine chronic WET testing and retesting is the NOEC_S. Statistical analysis must be consistent with the methods described in the documents referenced in OAC 252:690-3-29. For chronic test failure, see OAC ~~785:45~~252:730.

252:690-3-47. Reasonable potential to exceed temperature criterion for the implementation of temperature criteria to protect the Fish and Wildlife Propagation beneficial use

See OAC ~~785:46~~252:740.

252:690-3-54. Reasonable potential determination for the implementation of numerical criteria for toxic substances to protect the Fish and Wildlife Propagation beneficial use

C_{d(A)} and C_{d(C)} are calculated for each applicable criterion where a pollutant is present at measurable levels in the effluent or where an analytical detection level greater than the established MQL has been utilized. Also see OAC ~~785:46~~252:740.

252:690-3-60. Receiving water characterization for the implementation of dissolved oxygen criteria to protect the Fish and Wildlife Propagation beneficial use

DO modeling will be performed under conditions that are most critical with respect to processes that determine instream concentration of DO as outlined below.

(1) **Flow.** Background flow for models shall be set at the higher of the seven-day, two-year low flow for the study area or 1 cfs. When a daily flow record of ten years or more exists, a seasonal 7Q2 may be calculated and applied for streams designated as HLAC or WWAC. Also see OAC ~~785:46~~252:740.

(2) **Temperature.** The seasonal regulatory temperatures specified in the OWQS shall be modeled as background conditions unless site-specific data is available. If at least one year of average daily stream temperature values is available, the upper 90th percentile value calculated from the dataset for the season will be used.

(3) **Water quality constituents.** Where available, the long term average of measured values will be used to establish receiving water conditions. For seasonal analyses, values calculated from the dataset for the season shall be used. For simple models, assumed conditions estimated from similar streams in the area may be used.

252:690-3-61. Reasonable potential determination for the implementation of dissolved oxygen criteria to protect the Fish and Wildlife Propagation beneficial use

See OAC ~~785:46~~252:740.

252:690-3-64. Implementation of human health criteria for toxic substances to protect the Fish Consumption beneficial use

For the implementation of human health criteria for conservative substances, see OAC

252:690-3-64 through 3-70. These criteria only apply to receiving waters not designated as HLAC in Appendix A of OAC ~~785:45~~252:730.

252:690-3-67. Reasonable potential determinations in the implementation of human health criteria for toxic substances to protect the Fish Consumption beneficial use

Where a pollutant is present at measurable levels in an effluent or where an analytical detection level greater than the established MQL has been utilized, $C_{d(FF)}$ and $C_{d(NRWQC)}$ are calculated. Also see OAC ~~785:46~~252:740.

252:690-3-71. Implementation of human health and raw water criteria for toxic substances to protect the Public and Private Water Supply beneficial use

For the implementation of human health and raw water criteria for conservative substances, see OAC 252:690-71 through 77. These criteria only apply to receiving waters designated in Appendix A of OAC ~~785:45~~252:730 with the Public and Private Water Supply beneficial use.

252:690-3-74. Reasonable potential determination for the implementation of human health and raw water criteria for toxic substances to protect the Public and Private Water Supply beneficial use

Where a pollutant is present at measurable levels in an effluent or where an analytical detection level greater than the established MQL has been utilized, $C_{d(FFW)}$ and $C_{d(RAW)}$ are calculated. Also see OAC ~~785:46~~252:740.

252:690-3-82. Reasonable potential to exceed YMS and SS criteria

Where agriculture criteria are applicable, $C_{d(YMS)}$ and $C_{d(SS)}$ are calculated for each mineral constituent. Also see OAC ~~785:46~~252:740.

252:690-3-87. Implementation of criteria to protect the Aesthetics beneficial use

(a) Limitations and monitoring requirements for pollutants from previous permits are retained. (b)

Limitations and monitoring requirements may be established on a case-by-case basis to protect the aesthetics beneficial use of the receiving water established in OAC ~~785:45~~252:730.

(c) For effluents containing lignins, tannins, dyes, and other organic or inorganic chemicals that cause true color, the narrative water quality criterion for color shall be implemented by limiting the instream concentration after mixing to 70 Platinum-cobalt true color units based on a simple mass balance calculation. The following regulatory effluent flows apply for the implementation of the color criterion to protect the Aesthetics beneficial use:

- (1) for industrial facilities, $Q_{e(30)}$; and
- (2) for municipal facilities, $Q_{e(D)}$.

252:690-3-91. Performance-based monitoring frequency reductions and increases

(a) When MALs have been established in a previous permit and a parameter(s) has been monitored for one complete permit cycle (five years), performance-based monitoring frequency reductions or increases will be considered.

(1) Except for ammonia, when a permittee has experienced:

(A) no permit limit violation of any kind for a limited parameter during the permit cycle, a performance-based monitoring frequency reduction may be granted according to Table I-1 in Appendix I.

- (B) a non-SNC permit limit violation during the permit cycle, the permittee is ineligible for a performance-based monitoring frequency reduction for that parameter for the ensuing permit cycle.
- (C) SNC violations for a parameter during the permit cycle, the permittee is:
 - (i) ineligible for a performance-based monitoring frequency reduction for that parameter for the ensuing permit cycle, and
 - (ii) a monitoring frequency increase is required in accordance with Table I-2 in Appendix I.
- (2) Permittees may request toxicity-based ammonia limit monitoring frequency reductions according to 252:690-3-26 or WET testing frequency reductions according to 252:690-3-42.
- (3) The monitoring frequency for a metal may be reduced to once every six (6) months if:
 - (A) the permit includes a long-term average effluent concentration for the permit cycle of less than ten percent (10%) of the Monthly Average Concentration Limit;
 - (B) it no longer exhibits reasonable potential (either from monitoring or effluent limit); (C) there is a limit for that parameter in a previous permit that cannot be removed; and
 - (D) the parameter is not causing the receiving water body to be listed as a Category 5 water body in Oklahoma's Integrated Report.
- (b) Performance-based monitoring frequency reductions shall not be based on a weekly average, a daily minimum or a daily maximum concentration limit.
- (c) The permit frequency reductions stated in this Section and in Appendix I do not affect the need or number of control tests to be undertaken as required in Appendix A of 252:606.
- (d) In accordance with ~~785:45~~252:730-5-10 and ~~OAC 785:45~~252:730-5-16, no frequency reduction shall be allowed for bacteriological limitations.
- (e) Any control test undertaken in accordance with OAC 252:606, Appendix A, shall be reported on the DMRs as required by 40 CFR § 122.41 (l)(4)(ii), provided the control test sample meets all the sample protocol requirements as contained in the OPDES permit.

252:690-3-93. Monitoring for a nutrient limited watershed

A permittee shall monitor monthly for total nitrogen and/or total phosphorus if the discharge is to a nutrient limited watershed as designated in OAC ~~785:45~~252:730.

SUBCHAPTER 5. GROUNDWATER PROTECTION

252:690-5-10. Land application of Biosolids

Any person or entity engaged in the land application of biosolids must comply with the requirements for site restrictions, application rates, soil and vegetation criteria, record keeping, sampling, disposal and constituent prohibitions, and closure at ~~OAC 252:648~~ OAC 252:606-8 to protect groundwater quality.

252:690-5-17. Solid waste disposal sites

The owner/operator of any solid waste disposal site must comply with the requirements of OAC ~~252:540~~515 ~~or 252:520~~, as appropriate, to protect groundwater quality.

DRAFT

**APPENDIX A. WATER QUALITY STANDARDS IMPLEMENTATION PLAN,
OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY**

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PART III. PUBLIC AND INTERAGENCY PARTICIPATION

PART I. INTRODUCTION

(a) STATUTORY AUTHORITY.

27A O.S. §1-1-202(B) mandates each of the state's environmental agencies to promulgate a Water Quality Standards Implementation Plan (WQSIP) by July 1, 2001, for its jurisdictional areas of environmental responsibility in compliance with the Administrative Procedures Act and pursuant to the provisions of that section. After initial promulgation, each state environmental agency is required to review its WQSIP at least every three years thereafter to determine whether revisions to the plan are necessary.

(b) DEFINITIONS AND TERMS (not included in OAC 252:690-1-2 or OAC 252:690-1-3).

"40 CFR" means Title 40 of the Code of Federal Regulations.

"Section 106" means Section 106 of the CWA, which provides annual grants for water quality management activities and special projects.

"Section 301" means Section 301 of the CWA, which requires the achievement of EPA-established effluent limitations for industrial and municipal point source dischargers.

"Section 303" means Section 303 of the CWA, which requires states to review and, as necessary, revise their water quality standards at least every three years.

"Section 303(d)" means Section 303(d) of the CWA, which requires states to identify waters that do not or are not expected to meet applicable water quality standards with technology-based controls alone (sometimes referred to as the 303(d) List). States establish priority rankings for the listed waters, taking into account pollution severity and existing and designated beneficial uses of the waters. States must develop TMDLs for waters on this list according to priority rankings.

"Section 303(e)" means Section 303(e) of the CWA, which requires each state to prepare a CPP document.

"Section 306" means Section 306 of the CWA, which directs the promulgation of effluent limitations and standards of performance for certain categories of industries.

"Section 307" means Section 307 of the CWA, which provides the process for establishing effluent limitations for those pollutants otherwise known as "priority" pollutants, including pretreatment standards of performance for industrial facility discharges to POTWs.

"Section 401" means Section 401 of the CWA, which requires applicants for federal licenses or permits for the construction or operation of facilities which may result in discharges into navigable waters to provide the licensing or permitting agency a certification from the state in which the discharge originates or will originate or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or will originate.

"Section 402" means Section 402 of the CWA, which establishes the National Pollutant Discharge Elimination System (NPDES).

"AO" means an Administrative Order.

"ARAR" means appropriate, relevant and applicable requirements, when used in the context of Superfund and Brownfields-related investigations and remediations.

"BMP" means Best Management Practice(s), a technique determined to be the most effective, practical means of preventing or reducing pollutant discharges to achieve water quality goals. The term is generally applied in the context of nonpoint sources.

"BUMP" means Beneficial Use Monitoring Program, a program developed by the OWRB pursuant to 27A O.S. §1-3-101, for monitoring the state's surface and groundwater quality for the

purpose of determining compliance with the OWQS and the effectiveness of water quality management activities.

"CAA" means the Clean Air Act and amendments thereto.

"CEI" means Compliance Evaluation Inspection.

"CERCLA" means the Comprehensive Environmental Response, Compensation and Liability Act, also known as Superfund (see also SARA).

"CFR" means Code of Federal Regulations.

"CO" means Consent Order.

"Conventional Pollutants" means the following five pollutants: 5-day biochemical oxygen demand (BOD₅) or, alternatively, carbonaceous biochemical oxygen demand, (CBOD₅), suspended solids, oil and grease, fecal coliform and pH.

"Corp Comm" means the Oklahoma Corporation Commission.

"CPP" means the Continuing Planning Process document, which describes present and planned water quality management programs and the strategy used by the State in conducting these programs. Procedures for developing OPDES permit limitations utilizing the OWQS and OWQS Implementation Criteria are contained in this document.

"CWA" means the Clean Water Act and amendments thereto.

"DEQ" means the Oklahoma Department of Environmental Quality.

"DMR" means Discharge Monitoring Report, a report submitted to the WQD on a monthly basis via a specialized form by OPDES permittees in accordance with the effluent limitations and monitoring requirements of such permit and standard conditions thereof. Information provided on the DMR is entered into EPA's Permit Compliance System (see PCS) or Integrated Compliance Information System (see ICIS).

"ECLS" means the Environmental Complaints and Local Services Division of the DEQ.

"ELG" means Effluent Limitations Guideline, one of a series of technology-based effluent limitations standards, either for direct discharge to navigable waters or for discharge to a POTW, established for certain categories of industries pursuant to Sections 306 and 307 of the CWA.

"EPA" means the Environmental Protection Agency.

"EPA Region 6" means the EPA Region 6 office in Dallas, Texas.

"Fish and Wildlife Propagation" means the OWQS beneficial use designation for promoting fish and wildlife propagation for the fishery classifications of HLAC, WWAC, CWAC and Trout Fishery (Put and Take).

"Fish Consumption" means the OWQS beneficial use designation for the protection of human health for the consumption of fish flesh.

"HQW" means High Quality Water, defined as a water of the state which possesses an existing water quality which exceeds that necessary to support the propagation of fishes, shellfishes, wildlife, and recreation in and on the water, and which is designated as such in OAC 252:730, Appendix A.

"IU Permit" means Industrial User Permit, a permit issued in accordance with the National Pretreatment Regulation at 40 CFR Part 403 and, as appropriate, the categorical pretreatment standards at 40 CFR Parts 405 through 499.

"LPD" means the Land Protection Division (formerly the Waste Management Division) of the DEQ.

"LUST" means leaking underground storage tank.

"MCL" means maximum contaminant level.

"MSGP" means an industrial Multi Sector General Permit for the discharge of storm water.

"MS4" means Municipal Separate Storm Sewer System.

"NELAC" means the National Environmental Laboratory Accreditation Council.

"Nonpoint source" means a source without a well defined point of origin.

"Non-pretreatment program POTW" means a POTW receiving industrial wastewater discharges which does not have an approved pretreatment program, is not in the process of developing a pretreatment program, and has not been directed to develop a pretreatment program.

"NOV" means Notice of Violation.

"NPDES" means the National Pollutant Discharge Elimination System, as authorized by Section 402 of the CWA. The DEQ has received delegation of the NPDES program in Oklahoma, except for certain jurisdictional areas related to agriculture and the oil and gas industry retained by ODA and Corp Comm, for which EPA has retained permitting authority. The NPDES program is implemented in Oklahoma via the OPDES program pursuant to the OPDES Act and in accordance with the Memorandum of Agreement between the DEQ and EPA relating to administration and enforcement of the delegated NPDES program.

"NRC" means the U.S. Nuclear Regulatory Commission.

"OAC" means Oklahoma Administrative Code.

"OBDA" means the Oklahoma Brine Development Act.

"OCC" means the Oklahoma Conservation Commission.

"ODA" means the Oklahoma Department of Agriculture.

"ODM" means the Oklahoma Department of Mines.

"OPDES" means Oklahoma Pollutant Discharge Elimination System (see also NPDES).

"OPDES Act" means the Oklahoma Pollutant Discharge Elimination System Act.

"OPDES Permit" means a permit issued pursuant to the OPDES Act.

"OPDES Permitting Section" means the Wastewater Discharge Permit Section of the DEQ's Water Quality Division.

"ORW" means Outstanding Resource Water, defined as a water of the state which constitutes an outstanding resource or is of exceptional recreational and/or ecological significance, and which is designated as such in OAC 252:730, Appendix A.

"O.S." means Oklahoma Statutes.

"OSHA" means the Occupational Safety and Health Act and amendments thereto.

"OWQS" means the Oklahoma Water Quality Standards, established in OAC 252:730, as approved by EPA.

"OWQScreen" means a spreadsheet application package developed by the Wastewater Discharge Permit Section, Water Quality Division, for screening point source discharges against OWQS criteria and developing OPDES permit limitations.

"OWRB" means the Oklahoma Water Resources Board.

"Plan" means Water Quality Standards Implementation Plan.

"Point Source" means any discernible, confined and discrete conveyance or outlet, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, or vessel or other floating craft, from which pollutants are or may be discharged into waters of the state. The term "point source" shall not include agricultural storm water runoff and return flows from irrigated agriculture.

"**PPWS**" means Public and Private Water Supply, an OWQS beneficial use designation for the protection of human health for the consumption of water and consumption of fish flesh and water. This term is not synonymous with primary and secondary drinking water standards, as defined in OAC 252:631, Appendix A.

"**SARA**" means the Superfund Amendments and Reauthorization Act (see also CERCLA).

"**Scenic River**" means a river or stream so designated pursuant to the Oklahoma Scenic Rivers Act. A scenic river is automatically considered an ORW.

"**SDWA**" means the Safe Drinking Water Act and amendments thereto.

"**SEL**" means the State Environmental Laboratory of the DEQ's Customer Services Division.

"**SWP3**" means Storm Water Pollution Prevention Plan.

"**SWS**" means Sensitive Water Supply, defined as a water of the state which constitutes a sensitive public and private water supply, and which is designated as such in OAC 252:730, Appendix A.

"**TBLL**" means, in the context of the pretreatment program, Technically Based Local Limits.

"**Technology-based limitation**" means an effluent limitation based on various levels of technologically-achievable performance.

"**UAA**" means Use Attainability Analysis.

"**UIC**" means Underground Injection Control.

"**USAP**" means Use Support Assessment Protocols, as defined at OAC 252:740.

"**USFWS**" means the United States Fish and Wildlife Service.

"**USGS**" means the United States Geological Survey.

"**Water quality-based limitation**" means an effluent limitation required to attain and maintain water quality standards.

"**WQD**" means the Water Quality Division of the DEQ.

"**WQS Implementation Criteria**" means water quality standards implementation criteria, procedures used to implement the OWQS, including mixing zones, regulatory effluent and receiving water flows, determination of effluent wasteload allocations and criteria long term average concentrations, determination of permit limitations and antidegradation policy implementation. Statewide WQS Implementation Criteria of general applicability are found at OAC 252:740. Water quality standards implementation criteria for facilities under DEQ jurisdiction are found in OAC 252:690 and the CPP.

"WQSIP" means Water Quality Standards Implementation Plan.

(c) **REQUIRED WQSIP ELEMENTS.**

Pursuant to 27A O.S. §1-1-202(B), each agency's WQSIP must include eight elements for each of its jurisdictional areas of environmental responsibility. The eight required elements are:

(1) **Compliance with antidegradation requirements and protection of beneficial uses.**

This element describes the processes, procedures and methodologies utilized to ensure that programs within jurisdictional areas of environmental responsibility comply with antidegradation standards and lead to:

(A) Maintenance of water quality where beneficial uses are supported.

(B) Removal of threats to water quality where beneficial uses are in danger of not being supported.

(C) Restoration of water quality where beneficial uses are not being supported.

(2) **Application of USAP.** This element describes the procedures to be utilized by the agency in the application of USAP to make impairment determinations. USAP implementation criteria are found at OAC 252:740. The procedure by which a DEQ program area utilizes USAP in making waterbody beneficial use impairment determinations, or the manner in which USAP-derived support/impairment information is utilized in program area functions is described. USAP studies are spatial/temporal waterbody investigations utilizing established numerical criteria and/or implementation guidelines to determine whether existing and designated beneficial uses are being supported or not supported.

(3) **Description of programs affecting water quality.** This element describes the various agency programs and subprograms within each jurisdictional area of environmental responsibility. A program area is described in sufficient detail to convey the manner and process by which surface water quality standards or groundwater protection implementation is achieved.

(4) **Technical information and procedures for implementation.** This element includes technical information and procedures to be utilized in implementing the WQSIP. Technical information, databases, software programs and operational procedures, be they of federal or agency division/program area origin, that are utilized by a program area to implement the DEQ WQSIP are described.

(5) **Integration of WQSIP into water quality management activities.** This element describes how agency administrative rules, program area policies and guidance, and standardized methods of conducting business have been or will be developed to facilitate integration of the WQSIP into the water quality management activities within each jurisdictional area of environmental responsibility.

(6) **Compliance with mandated statewide water quality requirements.** This element describes the manner in which an agency will comply with mandated statewide requirements affecting water quality developed by other state environmental agencies including, but not limited to, TMDL development, point source wastewater discharge permitting activities, and NPS pollution prevention programs. The manner in which a program area utilizes statewide requirements affecting water quality is described in sufficient detail to demonstrate compliance with those requirements.

(7) **Public and interagency participation.** This element requires a summary of written comments and testimony received pursuant to all federal and state interagency reviews and

public meetings held by the state environmental agency, and the state environmental agency's response thereto, for the purpose of providing public participation related to its WQSIP. This element applies to both the initial WQSIP promulgation and revisions thereto.

(8) **Evaluation of the effectiveness of agency activities.** This element describes objective methods and means to evaluate the effectiveness of activities conducted pursuant to an agency's WQSIP in achieving water quality standards. BUMP and USAP assessments are the two primary means by which the effectiveness of water quality management activities may be evaluated on a continuing basis. Fish community biotrend monitoring and regulated activity self-monitoring provide additional means of evaluating program effectiveness.

(A) **BUMP.** The OWRB's Beneficial Use Monitoring Program was created in 1998 at the direction of the State Legislature. The program's monitoring is composed of five key elements, as follows:

- (i) Periodic river and stream monitoring, itself composed of two components:
 - (1) Monitoring at a series of fixed locations, determined by the OWRB in consultation with other state environmental agencies.
 - (2) Monitoring at a series of stations which rotate on an annual basis, the location and monitoring parameters of which are based largely on the state's list of impaired waterbodies (the so-called 303(d) list, established pursuant to Section 303(d) of the CWA).
- (ii) Fixed station load (flow) monitoring.
- (iii) Fixed station lakes monitoring.
- (iv) Fixed station groundwater monitoring.
- (v) Intensive investigative sampling involving identified impaired waters, primarily for the purpose of documenting the source of the impairment and determining appropriate restorative actions.

(B) **USAP.** Waterbody impairment and restoration studies, field surveys, monitoring results, or other available data will be assessed utilizing USAP.

(C) **Fish community biotrends monitoring.** This activity provides an additional biologically-oriented measure of the effectiveness of water quality management activities. Together, BUMP data, USAP studies and Fish Community Biotrends monitoring provide the best overall measures of water quality standards compliance and beneficial use support.

(D) **Regulated activity self-monitoring.** Site-specific monitoring of surface waters and groundwater outside the scope of BUMP and USAP is available to the DEQ on a continuing basis from the regulated community through its various regulatory programs.

- (i) **OPDES permits.** Self-monitoring required by OPDES permits issued by the Department. Continued compliance of point source dischargers in a waterbody segment with their OPDES permit limitations, as assessed through self monitoring, should correlate with a waterbody's compliance with state water quality standards as assessed through BUMP and USAP investigations. Likewise, self-monitoring of groundwater included in an OPDES permit is useful for assessing groundwater quality management where surface impoundments and/or land application are utilized.
- (ii) **Land Protection activities.** Self monitoring of surface waters and groundwater required by solid waste, hazardous waste, underground injection and site remediation regulatory activities yields valuable information for determining compliance with water quality standards and the effectiveness of Land Protection activities.

- (iii) **Water supplies.** Self-monitoring of public and private water supplies (both surface waters and groundwater) provides valuable information which may indicate present or impending problems in the maintenance of, or success in the restoration of, the suitability of those surface water supplies and groundwater sources for the public and private water supply beneficial use.

(d) **DEQ JURISDICTIONAL AREAS.**

The jurisdictional areas of the Department of Environmental Quality are listed in 27A O.S. § 1-3-101(B), 27A O.S. § 2-6-103(B)(2), and 82 O.S. § 1085.30.

PART II. WQSIP ELEMENTS BY JURISDICTIONAL AREA

(a) **GENERAL**

The eight required WQSIP elements are presented by jurisdictional area, and in some cases individual program areas within the scope of the jurisdictional area. DEQ's WQSIP will evolve to adapt to future changes in the OWQS and WQS implementation criteria.

(b) **WATER QUALITY PLANNING**

(1) **Compliance with antidegradation requirements and protection of beneficial uses.**

The antidegradation policy in the OWQS prohibits an increase in loading that would impair or further impair an existing use. In addition, the policy prohibits degradation of outstanding resource waters and high-quality waters, even if existing and designated uses would still be attained. Current CPP procedures regarding the 303(d) list, TMDL's, and loading allocations for both point and non-point sources of pollution are consistent with these provisions. DEQ may also adopt variances and site-specific criteria as set forth in 27A O.S. § 2-6-103(B).

(2) **Application of USAP.** Although evaluation of beneficial use support is not a water quality planning responsibility, its TMDL function is closely related and is utilized on a continuing basis to identify water bodies where USAP might be utilized to reevaluate a waterbody's beneficial uses. USAP, water quality standards, and EPA guidance will be considered to set appropriate target end points in the development of TMDLs.

(3) **Description of programs affecting water quality.** The CPP document, developed pursuant to requirements of Section 303(e) of the CWA, provides the basis and guidance for all water quality planning activities at the DEQ. Water quality planning staff are responsible for several water quality planning program elements:

(A) Developing procedures for planning and implementing water quality management programs in the CPP.

(B) Preparing recommendations for the listing and delisting of waterbodies in the 303(d) List.

(C) Establishing TMDLs for 303(d)-listed waterbodies and coordinating TMDLs with other state environmental agencies.

(4) **Technical information and procedures for implementation.** Technical information and procedures used in water quality planning activities are included in the CPP. Because it is such a significant element in water quality planning, the TMDL development process is described in detail. Proposed adoption of a TMDL is considered a major change to the state's Water Quality Management Plan. Public participation in TMDL development and adoption shall be conducted in accordance with state requirements and the procedures outlined in the CPP. The

TMDL loading allocation process culminates in the allocation of pollutant loads among various point sources, nonpoint sources, natural background sources and a margin of safety (MOS), according to the following equation:

$$\text{TMDL} = \text{WLA} + \text{LA} + \text{MOS}$$

TMDL is loading capacity, the maximum amount of pollutant loading a water body can receive without violating water quality standards. WLA is wasteload allocation, the portion of a receiving water's loading capacity that is allocated to existing and future point sources. LA is load allocation, the portion of a receiving water's loading capacity that is allocated to existing and future nonpoint sources and to natural background sources. MOS is margin of safety, the prescribed mechanism to account for the uncertainty in determining the amount of pollutant load and its effect on water quality. MOS is typically considered implicitly with conservative assumptions within calculations or models, explicitly during allocation of loads, or both. The major components of TMDL development are assessment of existing conditions, determination of maximum allowable loading, and allocation of loadings.

(A) Assessment of Existing Conditions

(i) Water Quality

The first step in assessing the current conditions is to gather available data and information on the water body. At a minimum, the water quality data (if available) that was used for listing the water body (re: 303(d) List) should be reviewed. The sufficiency and adequacy of existing data is evaluated and described. The DEQ will consider data to be sufficient and adequate when the data accurately characterizes the conditions of the water body, watershed, pollutant, and pollutant sources throughout typical geographic and temporal conditions with reasonable certainty. Some TMDL projects will require additional watershed information relating to particular water quality conditions, as existing data alone may be insufficient to support the analytical needs of TMDL projects. Data on low-flow conditions, storm-flow conditions, and seasonal variations are gathered when appropriate to the situation. Data will be evaluated considering USAP, water quality standards, and EPA guidance.

(ii) Pollutant Load

Before pollutant loads are allocated among sources, the location and types of sources, and the current and projected pollutant load for each source are identified. Current loading and source contributions are established by measuring pollutant loads directly, calculating or estimating loads from water quality and flow data, estimating loads with mathematical models, or using a combination of these methods. Examples of data utilized for pollutant source analysis include:

- watershed and sub watershed boundaries
- hydrologic interaction between surface water and groundwater
- locations of stream segments
- locations of pollutant sources
- types of pollutant sources
- anticipated growth of discharges
- meteorological/rainfall data and runoff coefficients
- land uses and land cover
- soil types.

An inventory is developed of all known factors in the watershed which influence water quality. These factors might include permitted industrial and municipal wastewater discharges, concentrated animal feeding operations (CAFOs), waste application sites, cropland, forestry operations, industrial storm water runoff, urban runoff, construction activities, and other sources such as natural background. This information will be collected and maintained by sub-watershed where possible to enhance the identification of cause-and-effect relationships. The watershed inventory is compiled from land use data, special investigations, DEQ complaint investigations, DEQ permit databases, surface water monitoring data, input from other agencies, and watershed stakeholder input through an outreach process.

(B) Maximum Allowable Loading

A water body's loading capacity is an estimate of the maximum amount of pollutant loading the water body, considering critical conditions (i.e. flow, temperature, etc.), can receive over time without exceeding water quality standards. Hydrological, biological, chemical, and pollutant fate and transport data are required to calculate a water body's loading capacity. The maximum loading capacities of a waterbody are determined in most cases using a water quality model or models adapted specifically for the waterbody in question. The model used is selected on a case by case basis and is based on available resources, the identified pollutant source(s) and the availability of water quality data.

(C) Allocation of Loadings

Future growth, spatial and temporal variations in flows and loadings, antidegradation, antidegradation and pollutant sources and source categories must be considered and incorporated when developing a loading, unless it is demonstrated that one or more of these factors is not relevant to the particular load allocation.

(D) Pollution Allocation Strategies

There are three common methods for allocating loads; equal percent removal, equal effluent concentrations, and a hybrid method. Other methods are considered if necessary.

(i) Equal Percent Removal

Equal percent removal exists in two forms. In one, the overall removal efficiencies of the sources are set so that they are all equal. In the other, the incremental removal efficiencies beyond the current discharge are equal.

(ii) Equal Effluent Concentration

This method is self-evident. It is similar to equal percent removal if influent concentrations at all sources are approximately the same.

(iii) Hybrid Method

With this method, the criteria for waste reduction may not be the same from one source to the next. One source may be allowed to operate unchanged while another may be

required to provide the entire load reduction. More generally, however, a proportionality rule may be assigned that requires the percent removal to be proportional to the input source loading or flow rate.

(iv) Other Methods

Any other method contained in EPA guidance. The DEQ shall approve the use of the method on a case-by-case basis.

(E) Pollutant Trading

Where appropriate and technically feasible, tradeoffs among wasteload allocations are considered. Technological feasibility, economic issues, and regulatory authority are evaluated when trading allocations. Pollutant trades are acceptable so long as water quality standards (including antidegradation regulations and policies) and minimum applicable technology-based controls are met.

(F) Margin of Safety

The margin of safety (MOS) is the prescribed mechanism to account for the uncertainty associated with TMDL projects. Guidelines for appropriate margins of safety are included in the CPP. The MOS can be included in more than one of the TMDL analytical steps. To represent the MOS, conservative assumptions should be used in completing one or more of the following steps:

- (i) derivation of numeric water quality targets
- (ii) determination of pollutant sources
- (iii) representation of pollutant fate and transport relationships
- (iv) determination of the degree of pollutant reduction achievable through management measures and control actions

(5) **Integration of WQSIP into water quality management activities.** DEQ administrative rules and WQD policies are currently in place which integrate the requirements of the WQSIP into water quality planning. Should WQSIP revisions be necessary in future years, rule changes and policy changes will be made to address and incorporate such requirements.

(6) **Compliance with mandated statewide water quality requirements.** TMDL activities comply with the procedures established in the CPP. Coordination of TMDL activities among state agencies is the primary responsibility of the TMDL Work Group, which is chaired by the DEQ and includes the state environmental agencies with water quality responsibilities.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** The 303(d) listing/delisting process, which in turn utilizes USAP, will be used to evaluate the effectiveness of all DEQ programs related to surface water quality.

(C) **POINT SOURCE DISCHARGES - OPDES PERMITTING**

The primary mechanism for controlling pollution from point source discharges to waters of the state is through the OPDES permitting, compliance monitoring and enforcement processes. OPDES permits include such effluent limitations as are necessary to protect water quality and existing and designated beneficial uses of the receiving water(s). OPDES permit enforcement activities are described in Part II(r) of the Plan.

(1) **Compliance with antidegradation requirements and protection of beneficial uses.**

(A) **General.** The OWQS provides a tiered antidegradation policy designating levels of protection. An OPDES permit and the pollutant limitations therein must, at a minimum,

serve to protect the existing and designated beneficial uses of the receiving surface water, thereby affording it protection from degradation at the most basic level (Tier 1). In those cases where existing or proposed discharges are to a designated HQW, SWS, or to waters of ecological and/or recreational significance or endangered/threatened species habitat (OAC 252:740, Appendix B waters), a higher degree of protection from degradation (Tier 2) must be afforded the waterbody. In no case will any discharge be permitted which would, if it occurred, lower existing water quality in an SWS or HQW, regardless of the date of its original existence. A designated Scenic River and/or Outstanding Resource Water (ORW) and their watersheds must be afforded the highest degree of protection (Tier 3), which may even involve denial of a permit to discharge or denial of an increased pollutant loading in the discharge, depending on whether the discharge existed on or prior to June 11, 1989 (non-storm water), or June 25, 1992 (storm water)

(B) **Fact Sheet/Statement of Basis.** An OPDES permit's Fact Sheet/Statement of Basis must address how permit limitations are developed, which in turn assures compliance with the OWQS and WQS implementation criteria for protecting existing and designated beneficial uses. To ensure that compliance with antidegradation requirements is addressed in an individual OPDES permit, the permit's Fact Sheet or Statement of Basis shall specifically describe the antidegradation level applicable to the receiving water and any permitting considerations necessary to afford that level of protection. In cases where permit issuance is denied based on Tier 2 or Tier 3 antidegradation criteria, the statement of basis for the permit denial shall so state. Authorizations issued under a General Permit do not require separate fact sheets. As General Permits expire and are reissued, the associated fact sheets will incorporate a discussion of antidegradation requirements and protection of beneficial uses.

(2) **Application of USAP.** The making of beneficial use support/impairment determinations for surface waters is not a component of this program area, but such determinations of beneficial use support or impairment may directly affect the OPDES permitting process in terms of the level of pollutant control technology that may need to be employed for discharges to an impaired waterbody and compliance with the anti-backsliding provisions in Section 402(o) of the CWA. This becomes particularly important when a facility's effluent contains the pollutant(s) causing or contributing to the impairment of a waterbody. For this reason, OPDES permitting procedures will include a review of the 303(d) list and available USAP data applicable to the receiving water.

(3) **Description of programs affecting water quality.**

(A) **Direct discharges.** Municipal POTWs and industrial facilities under DEQ jurisdiction which discharge process wastewaters directly to waters of the state are required to obtain OPDES permits from the Department. Included are discharge authorizations under a General Permit for those facility classes for which general permits have been developed, discharges from water treatment plant wastewaters (OAC 252:631, Subchapter 1), and discharges generated by groundwater remediation activities (OAC 252:611, Subchapter 5). These OPDES permits limit the concentration and loading of specified pollutants in such discharges and require periodic self-monitoring and reporting of levels of the limited pollutants in the facility's discharge(s). Numeric limitations result from the application of the more stringent of technology or water quality-based criteria. OPDES permits may include narrative limitations, effluent or receiving water background

monitoring, schedules of compliance and such other special conditions as may be necessary to prevent, control or abate pollution.

(B) **Indirect discharges.** OPDES permits may also take the form of individual IU permits for industrial facilities which discharge to a non-pretreatment program POTW.

(4) **Technical information and procedures for implementation.**

(A) **Permitting procedures.** OPDES permit limitations are developed using the more stringent of technology-based limitations (secondary treatment standards for municipal POTWs and industrial category-specific ELGs for industries) or water quality-based limitations derived utilizing the OWQS and WQS implementation criteria in OAC 252:740 and OAC 252:690, Subchapter 3. Where technology-based limitations for conventional pollutants are not sufficient to maintain OWQS-prescribed criteria a WLA is developed, approved by EPA Region 6, and publicly noticed. Where technology-based limitations for conventional pollutants are not sufficient to maintain OWQS-prescribed DO criteria for fish and wildlife propagation, a DO-based WLA for oxygen demanding substances (ammonia plus either BOD₅ or CBOD₅) and DO is generated, approved by EPA Region 6, and publicly noticed. DO-based monthly average ammonia limits, as well as technology-based ammonia limits for certain categories of industries, are compared against the toxicity-based monthly average ammonia limit derived from the 6 mg/l chronic screening value for ammonia at the edge of the chronic mixing zone. Where the toxicity-based ammonia limit is more stringent than either a DO-based limit or a technology-based limit, the toxicity-based limit is established in the permit. Where a DO-based ammonia limit applies for a portion of the year, but not the entire year, a toxicity-based limit applies during the season for which the DO-based WLA is silent. For pollutants with numerical criteria in the OWQS, water quality-based permit limitations are required where a measurable pollutant in an effluent exhibits reasonable potential. WLAs and criterion LTAs are calculated, and permit limits are developed from the criterion LTAs. The most stringent monthly average limit and its associated daily maximum limit are established in the permit. Where reasonable potential is exhibited to exceed an NRWQC human health/fish consumption criterion in the absence of a promulgated state criterion, effluent monitoring, rather than a limitation, is required and OWRB is notified so that they may consider the need for a water quality criterion. Permit limits are developed in accordance with OAC 252:690, Subchapter 3. Where an industrial technology-based limitation applies to a pollutant and reasonable potential is not exhibited for the effluent to exceed an applicable water quality criterion for that pollutant, the technology-based limitation is itself screened to determine whether it would, if the pollutant were present in the effluent at a concentration equal to the technology standard's monthly average limit, exhibit reasonable potential. If so, a water quality-based permit limitation is required for that pollutant.

(B) **OWQS criteria screening.** Because of the complexity of the mathematical and statistical computations necessary to screen for reasonable potential, calculate WLAs and limiting criterion LTAs, and develop permit limits, the WQD has developed two spreadsheets for this purpose, one for discharges to streams and the other for discharges to lakes. Together they are referred to by the DEQ as OWQScreen. The Permitting Section will utilize, maintain and update OWQScreen, as necessary, to remain current with the OWQS and WQS implementation criteria in OAC 252:740 and OAC 252:690, Subchapter 3. Site specific OWQScreen spreadsheets will be developed on an as-needed basis for receiving waters for which site-specific metals criteria are developed and adopted into the

OWQS in accordance with OAC 252:730, Appendix E. Should TBLLs be required in DEQ-issued IU permits or in municipally-issued IU permits, OWQScreen also provides the capability to calculate the entire array of (theoretical) water quality-based permit limits for pollutants with numerical criteria in the OWQS (i.e., limits that would be established in a given OPDES permit were reasonable potential demonstrated to exceed an applicable water criterion).

(C) **Effluent and background monitoring.** Ten data points are required to properly characterize the standard deviation of an effluent or background data distribution. Often there are no background data available and only a single effluent data point. Where the use of such limited effluent and background data does not result in reasonable potential for a pollutant, a permit writer must determine whether additional effluent or background monitoring is warranted as a permit condition. Procedures are established at OAC 252:690, Subchapter 3, to objectively and uniformly evaluate where additional monitoring is warranted where less than 10 data points are available.

(5) **Integration of WQSIP into water quality management activities.** Because of the SB 549-mandated reallocation of a major portion of the WQS implementation criteria to the various state environmental agencies, the DEQ has promulgated WQS implementation criteria for point source discharges and groundwater protection in OAC 252:690, based on the OWQS and the foundational statewide implementation criteria in OAC 252:740.

(6) **Compliance with mandated statewide water quality requirements.** Procedures for the development of individual and general OPDES permits issued to municipal POTWs and industrial facilities utilize and are in compliance with all applicable statewide surface water quality requirements. Compliance with statewide groundwater quality requirements in OPDES permits is described in Part II(q). OPDES permits require that environmental laboratories utilized in fulfilling analytical monitoring requirements be certified by the SEL (see Part II(n)). In the permitting of surface coal mine discharges, the WQD must interface with the ODM, since surface coal mine discharge permit limitations and monitoring requirements are tied to the status of the mine (active, Phase I SMCRA bond release awaiting Phase II release, of post-Phase II release). The WQD must also interface with Corp Comm in the permitting of LUST groundwater remediation-related discharges. The WQD must receive notification from Corp Comm when a LUST remediation project is terminated so that the OPDES permit may be terminated.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** For surface waters, BUMP data and beneficial use support/impairment studies utilizing USAP are capable of providing long term evaluations in selected areas of whether OPDES permitting activities (as well as OWQS water quality criteria, WQS implementation criteria and permitting procedures upon which the water quality-based portion of the program is based) adequately protect assigned beneficial uses and maintain or improve water quality on site-specific, segment and basin-wide levels. Where existing and designated beneficial uses are not being met according to Tier 1 antidegradation requirements or where water quality degradation is experienced counter to Tier 2 or Tier 3 antidegradation requirements, the program's point source permitting procedures, as well as the OWQS and WQS implementation criteria, may need reexamination. Background pollutant levels, where used in the OPDES permitting process, may be compared against BUMP and USAP data where permit limitations appear not to protect and maintain beneficial uses as

intended. The use of unrepresentative background information may over- or under-estimate the assimilation capacity of a receiving water. Likewise, BUMP and USAP procedures may need to be reexamined.

(9) **Nutrient limited watershed.** A permittee shall monitor monthly for total nitrogen and/or total phosphorus if the discharge is to a nutrient limited watershed as designated in OAC 252:730.

(d) **POINT SOURCE DISCHARGES – PRETREATMENT**

(1) **Compliance with antidegradation requirements and protection of beneficial uses.** Incorporation of the general pretreatment regulations at 40 CFR Part 403 into OPDES permits for POTWs with approved pretreatment programs or POTWs developing such pretreatment programs provides an additional means of compliance with antidegradation requirements and protection of beneficial uses.

(2) **Application of USAP.** The making of beneficial use support/impairment determinations for surface waters is not a component of this program area.

(3) **Description of programs affecting water quality.** IU permits for industrial discharges to POTWs in approved pretreatment program municipalities are issued by the designated municipal control authority. General oversight is provided by the DEQ's State Pretreatment Coordinator, who acts as the pretreatment program approval authority. The Pretreatment Coordinator reviews pretreatment program submittals, revisions to previously approved pretreatment programs, and pretreatment program annual reports for compliance with the National Pretreatment Regulations found at 40 CFR Part 403. The DEQ issues IU permits for industrial discharges to non-pretreatment program POTWs. Inspection and enforcement oversight for both approved pretreatment programs and IU permits for industries discharging to non-pretreatment program POTWs is provided by the WQD Industrial Enforcement Section.

(4) **Technical information and procedures for implementation.** OWQScreen spreadsheets provide the capability to calculate potential effluent limits for TBLLs. The State Pretreatment Coordinator will disseminate this information to municipalities with approved pretreatment programs for their use.

(5) **Integration of WQSIP into water quality management activities.** Integration of the WQSIP into water quality management activities is accomplished through the OPDES permitting process.

(6) **Compliance with mandated statewide water quality requirements.** Pretreatment program procedures utilize and are in compliance with all applicable statewide surface water quality requirements.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** The effectiveness of pretreatment program water quality management activities is directly monitored on a statewide basis by Pretreatment Compliance Inspections and Pretreatment Audits of POTW pretreatment programs, as well as through a POTW's compliance with its permit limitations, as tracked by PCS or ICIS.

(e) **POINT SOURCE DISCHARGES – WHOLE EFFLUENT TOXICITY (WET)**

(1) **Compliance with antidegradation requirements and protection of beneficial uses.** Compliance with antidegradation requirements and protection of beneficial uses is provided

through incorporation of WET testing procedures and, if necessary, WET limits into OPDES permits. A narrative toxicity criterion implementation strategy for ammonia was developed cooperatively between the DEQ, OWRB and EPA Region 6 permitting staff in November 2000 and was revised in January 2001.

(2) **Application of USAP.** The making of beneficial use support/impairment determinations for surface waters is not a component of this program area.

(3) **Description of programs affecting water quality.** Toxics staff reviews OPDES permit WET testing requirements during the permit drafting process. In addition to reviewing draft permits, the Toxics staff reviews WET testing summary reports submitted by the regulated community in accordance with the conditions of their OPDES permits to ensure that the information input to PCS or ICIS via DMRs accurately reflects actual test results and the completion of valid testing. Where persistent lethality has been demonstrated through repeated WET testing, the permittees are required to conduct a TRE. TREs or TIEs may be required for intermittent lethality or persistent sublethality. Permits may also contain provisions for management practices to control toxicity. The Toxics staff reviews TRE/TIE progress, provides general oversight to the TRE/TIE process, and coordinates DEQ involvement regarding corrective actions and related WET or pollutant-specific limitations to be incorporated into affected OPDES permits.

(4) **Technical information and procedures for implementation.** OWQScreen provides the capability to determine the appropriate type of WET test, critical dilution and dilution series for an OPDES permit. Toxics staff, through critical review of submitted WET test reports, will assist permitting staff in determining whether WET limits are necessary and whether performance-based monitoring frequency reductions are warranted.

(5) **Integration of WQSIP into water quality management activities.** Integration of the WQSIP into water quality management activities is accomplished through the OPDES permitting process.

(6) **Compliance with mandated statewide water quality requirements.** The Toxics staff reviews OPDES permit WET testing requirements during the permit drafting process to ensure that appropriate WET testing is prescribed in the permit and is in accordance with the requirements of OAC 252:730 and OAC 252:690, Subchapter 3.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** The effectiveness of biomonitoring permitting procedures, the review of WET testing results and the oversight of TRE/TIE activities is evaluated to a considerable extent through the affected facilities achieving compliance with the OWQS narrative toxicity criterion. BUMP and fish community biotrend information may also provide valuable feedback on the effectiveness of biomonitoring activities.

(f) **POINT SOURCE DISCHARGES – STORM WATER MANAGEMENT**

(1) **Compliance with antidegradation requirements and protection of beneficial uses.**

(A) **General.** In a manner similar to that for individual OPDES permits, requirements for sector-specific industrial facilities, regulated construction sites, and MS4s must protect the existing and designated beneficial uses of the receiving surface water at the Tier 1 level. Tier 2 and Tier 3 levels of protection apply to storm water discharges as well. Where Tier 3 level protection is necessary (except for storm water discharges from temporary

construction activities), only storm water discharges existing as of June 25, 1992, may be permitted. In no case will any discharge be permitted which would, if it occurred, lower existing water quality in an SWS or HQW, regardless of the date of its original existence.

(B) **Storm water construction permit.** The DEQ's Storm Water Construction Permit was issued on September 13, 2007, pursuant to 27A O.S. § 2-14-101 *et seq.*, and in accordance with OAC 252:004. The permitting process utilizes a watershed-specific sensitive area identification system for endangered species rather than the more general county-indexed identification system developed by EPA. Applications for a construction storm water permit for a development site within a sensitive area are scrutinized in greater depth by the USFWS. Stricter erosion control methods and best management practices may be required where Tier 3 level protection is required.

(C) **Industrial stormwater multi-sector general permit.** The DEQ Multi-Sector General Permit for storm water discharges associated with industrial activities was issued on April 7, 2006. Where no additional storm water-related pollutant loading is permitted in a Scenic River watershed, an applicant for an MSGP may either utilize an existing discharge or provide the capability to capture and totally retain all storm water that enters or is incident upon such property.

(D) **Small MS4 general permit.** The DEQ Final Small MS4 General Permit for small municipal separate storm sewer system discharges was issued on February 8, 2005.

(2) **Application of USAP.** The making of beneficial use support/impairment determinations for surface waters is not a component of this program area.

(3) **Description of programs affecting water quality.** Regulated construction sites must obtain a Storm Water Construction Permit authorization. Sector-specific industrial facilities under DEQ jurisdiction which discharge storm water directly to waters of the state are required to obtain an OPDES Industrial MSGP authorization. The Department used the NPDES (EPA) Multi-Sector Industrial Permit (issued on September 29, 1995 by EPA) until October 2, 2000, when the OPDES (State) MSGP was issued. Storm water permits may also take the form of individual industrial OPDES permits for facilities discharging to waters of the state directly or via discharge to the storm water collection system of an MS4 municipality.

(4) **Technical information and procedures for implementation.** Application, authorization and termination procedures, and coverage limitations are specified in the permits. Information provided by the USFWS is utilized in determining where more restrictive conditions are required in storm water general permits to protect sensitive habitat areas identified by the USFWS. Inspections are conducted when termination of coverage under a storm water permit is requested in order to verify that the site is stabilized and/or storm water discharges have ceased.

(5) **Integration of WQSIP into water quality management activities.** The State MSGP requires an annual Site Compliance Evaluation Report to be completed by facility owners, managers or operators. The report will describe reportable spills and storm water-related events which may have affected surface water or groundwater quality. Changes or amendments to SWP3s or BMP documents will also be documented through this report. This new reporting method replacing the use of reporting storm water monitoring activities by DMR will require facility owners, managers and/or operators to become directly involved with permit compliance.

(6) **Compliance with mandated statewide water quality requirements.** Storm water permitting activities utilize and are in compliance with all applicable statewide surface water quality requirements.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** The State MSGP requires facility owners, managers and/or operators to become directly involved with permit compliance and will ensure a more effective storm water management program. Storm water discharges from certain industrial sectors are subject to numeric effluent limits and monitoring requirements. DMRs submitted by these facilities are evaluated for compliance with effluent limits. Municipalities with an MS4 permit must submit an annual report describing stormwater control activities and improvements.

(g) **NONPOINT SOURCE POLLUTION**

The WQD is the focal point for assessment and consideration of loads from nonpoint sources. The effect of nonpoint source pollution is an integral part of TMDLs and basin-wide planning.

(1) **Compliance with antidegradation requirements and protection of beneficial uses.** To the extent possible through site investigations and cooperation with other state agencies, the TMDL process takes into account nonpoint sources of pollution in establishing point source wasteload allocations and nonpoint source load allocations which will comply with antidegradation requirements and protect existing and designated beneficial uses.

(2) **Application of USAP.** Although evaluation of beneficial use support is not a water quality planning staff responsibility, its surface water quality-related programs, particularly the TMDL program, will be utilized on a continuing basis to identify water bodies where USAP might be utilized to reevaluate a waterbody's beneficial uses as affected by nonpoint sources. USAP, water quality standards, and EPA guidance will be considered to set appropriate target end points in the development of TMDLs.

(3) **Description of programs affecting water quality.** Water quality planning staff are responsible for two water quality planning program elements, both of which involve the need to account for nonpoint sources of pollution:

- (A) Procedures for planning and implementing water quality management programs in the CPP.
- (B) Preparing recommendations for the listing and delisting of waterbodies in the 303(d) List, and development of TMDLs.

(4) **Technical information and procedures for implementation.** Technical information and procedures used in water quality planning activities, including accounting for nonpoint sources of pollution, are included in the CPP.

(5) **Integration of WQSIP into water quality management activities.** Federal and state rules and WQD policies are in place that integrate the requirements of the WQSIP into water quality planning. Should WQSIP revisions be necessary in future years, rule changes and/or policy changes will be made to address and incorporate such new requirements.

(6) **Compliance with mandated statewide water quality requirements.** TMDL activities require consideration of nonpoint sources of pollution and must comply with the procedures established in the CPP which involve consideration thereof. Coordination of TMDL activities among state agencies is the primary responsibility of the TMDL Work Group, which is chaired by the DEQ and includes the state environmental agencies with water quality responsibilities.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** The 303(d) listing/delisting process, which in turn utilizes USAP, will be used to evaluate the effectiveness of DEQ programs related to nonpoint source aspects of surface water quality.

(h) **SECTION 106 POLLUTION CONTROL PROGRAM**

This program area is not directly applicable to WQS implementation.

(i) **WATER QUALITY PROTECTION AND CERTIFICATION**

Surface water and groundwater quality protection are described under the various program areas in the Plan. Water quality certification under Section 401 of the CWA is a specific responsibility of the WQD.

(1) **Compliance with antidegradation requirements and protection of beneficial uses.**

Section 401 water quality certifications are the vehicle that a state uses to ensure that Federal permits comply with State antidegradation requirements and existing and designated beneficial uses are not compromised. These water quality certifications are DEQ documents that impose conditions in federal permits or licenses that are specifically intended to ensure attainment of the specific antidegradation requirements and protection of beneficial uses assigned in the OWQS.

(2) **Application of USAP.** The making of beneficial use support/impairment determinations for surface waters is not a component of the Section 401 certification process, although beneficial use support/non-support determinations and resulting listing/delisting of waterbodies on the 303(d) List may affect Section 401 certifications.

(3) **Description of programs affecting water quality.** Applicants for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, dredge or fill, or other activities which may result in any discharge into, or pollution or alteration of, waters of the state must obtain a Section 401 water quality certification from the DEQ. Applications for Section 401 certifications are submitted to the DEQ in accordance with OAC 252:611, including mitigation plans when required by the federal permitting entity.

(4) **Technical information and procedures for implementation.** Technical information and procedures used to implement water quality protection are located at OAC 252:611. The DEQ maintains a database of all water quality certifications issued to projects on waters of the state.

(5) **Integration of WQSIP into water quality management activities.** Existing Section 401 certification procedures are consistent with the purpose and content of this Plan.

(6) **Compliance with mandated statewide water quality requirements.** Compliance with statewide water quality requirements is an inherent part of the Section 401 certification process. Water quality certification uses permit review, permit conditions, and the expertise of other state agencies to accomplish the task of ensuring compliance with statewide water quality requirements.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** The effectiveness of Section 401 water quality certification can be observed in the attainment and maintenance of existing and designated beneficial uses by the affected facilities or operations.

(j) **OPERATOR CERTIFICATION**

This program area is not directly applicable to WQS implementation.

(k) **LAND PROTECTION**

Several jurisdictional areas (UIC, hazardous waste, solid waste, Superfund, Brownfields and radiation management) are subsumed under Land Protection.

(1) **Compliance with antidegradation requirements and protection of beneficial uses.** All permits and approvals issued by the LPD include technical provisions to protect groundwater and/or surface water. Should releases occur, the owner/operator of a regulated facility will be required to take appropriate measures to protect fresh water sources, and conduct remedial actions as necessary.

(A) **UIC.** UIC permits provide a technically sound basis to ensure that injected fluids do not migrate from the permitted zones of injection and compromise the protection of underground sources of drinking water. Financial assurance is required for closure (plugging and abandonment) and post-closure care (groundwater monitoring) is required as applicable.

(B) **Hazardous waste/solid waste.** For all land-based hazardous waste disposal facilities, existing rules require that the owner/operator monitor for releases to groundwater. Surface water is generally only monitored if a release is suspected. Monitoring wells are the usual method of release detection. Plans for closure and post-closure and any appropriate monitoring or remedial actions are required in the permit. Financial assurance is required for closure and post-closure care (maintenance and monitoring). The Solid Waste program issues permits for technically complete applications that ensure protection of groundwater and prevention of surface water contamination from runoff. Financial assurance for post-closure care and monitoring of groundwater are included in Municipal Solid Waste Management permits.

(C) **Superfund/Brownfields.** LPD is charged with Superfund responsibilities of the state under CERCLA except for SARA Title III planning requirements. The Brownfields Redevelopment/Voluntary Cleanup program is included in this jurisdictional area.

(D) **Radiation management.** Radiation protection permitting and licensing requirements ensure that antidegradation requirements are met and protection of beneficial uses of both surface waters and groundwaters are maintained.

(2) **Application of USAP.** The making of beneficial use support/impairment determinations for surface waters is not a component of this program area. However, in voluntary cleanups, use support assessments obtained through the USAP process will be considered in final remedy decision-making during the risk assessment and exposure scenario development.

(3) **Description of programs affecting water quality.**

(A) **UIC.** UIC permits are issued to private and commercial facilities wishing to inject fluids underground for disposal or mineral extraction purposes under OAC 252:652 and 40 CFR Parts 144 through 146 and 148.

(B) **Hazardous waste/solid waste.** Hazardous and solid waste permits are issued to treatment, storage and disposal facilities (TSDs) and municipal and commercial solid waste facilities. The hazardous waste program issues permits for TSDs pursuant to OAC 252:205 and 40 CFR Parts 260 through 270. Solid waste permits are issued under OAC 252:515. Facilities wishing to close solid or hazardous waste management facilities must comply

with all the post-closure care and groundwater monitoring requirements of the above-cited regulations.

(C) **Superfund/Brownfields.** This program identifies, investigates, designs, and conducts remediation of uncontrolled hazardous waste sites and conducts groundwater remediation where feasible. The Superfund program acts in a support role to EPA and other state emergency response entities in emergency response actions. This program has a positive effect on water quality by identifying and remediating waste sources that have significant potential to affect water quality, and by containing, monitoring or remediating affected groundwater and surface water. Brownfields authority is found at 27A O.S. §2-15-101 *et seq.*, and Superfund authority is found at 40 CFR Part 300.

(D) **Radiation management.** Licensing activities for the use and management of byproduct material, special nuclear material, and sources of radiation, except for activities pertaining to diagnostic x-ray systems, are controlled by the LPD's Radiation Management Section since completion of delegation of these authorities from the NRC.

(4) **Technical information and procedures for implementation.**

(A) **UIC.** UIC permits specify the conditions under which a UIC well will be permitted. Considerations include zone(s) of injection, rates, pressures, temperatures and annulus monitoring requirements. Monitoring locations, frequencies, parameters and reporting are specified. A detailed closure plan including financial assurance is also required in the permit.

B) **Hazardous waste/solid waste.** Hazardous waste and solid waste permits specify conditions for facility construction and operation, groundwater monitoring, and reporting specific parameters that indicate releases to groundwater. The location and frequency of monitoring wells are designed to detect releases should they occur. Action levels are specified in the permit. Risk-based remediation would consider protection of aquifers in the decision-making process. Surface water monitoring occurs when potential releases to surface water exist, or when impacted groundwater interfaces with surface water. Closure, post-closure and corrective action plans, as well as financial assurance, are required by the permits.

(C) **Superfund/Brownfields.** Superfund/Brownfields include determinations of ARARs for remedial decision-making or risk-based closure for protection of surface water and groundwater. Groundwater uses will be considered to determine cleanup and remediation decisions. Emergency response actions will also include protection of public water supplies, surface water and groundwater. The remediation of sites in the Superfund/Brownfields program sometimes requires the treatment and discharge of wastewater and/or stormwater. The program coordinates with WQD to identify the appropriate discharge and permitting requirements. These requirements would be evaluated as ARARs in any cleanup decisions. Many sites in these programs have historic groundwater and surface water contamination. Cleanup decisions are risk-based and generally include MCLs or other criteria to protect groundwater or surface water. Antidegradation and beneficial uses are considered for cleanup. Cleanup for some sites may include containment of contaminants to prevent further degradation of groundwater or surface water. A systematic monitoring program may verify natural attenuation of contamination in groundwater.

(5) **Integration of WQSIP into water quality management activities.** The Department currently has rules (both federal and state) and agency policies in place that

fully implement applicable portions of the OWQS. Departmental rule or policy changes will be made as necessary to implement new or modified aspects of the OWQS.

(6) **Compliance with mandated statewide water quality requirements.** Siting of new facilities and regulated units must be permitted in such a manner that sensitive surface water and groundwater supplies are protected. In addition, operators of permitted facilities are required to perform appropriate monitoring so that releases can be detected and contained in a timely manner and corrective action, if necessary, can be implemented to remediate an impacted water body.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** The effectiveness of LPD activities to protect water quality is evaluated by the routine monitoring of permitted facilities for both groundwater and surface water impacts. On-site inspections of permitted facilities and site visits to voluntary cleanup efforts ensure compliance with applicable rules and regulations. In addition, the environmental indicators reporting requirements provide a suitable evaluation methodology for the permitted and voluntary remediation sites within the jurisdiction of the LPD.

(1) **WATER AND WASTEWATER TREATMENT SYSTEMS (NON-INDUSTRIAL)**

This program area includes the construction permitting of municipal and other publicly-owned water and wastewater treatment systems, including the land application of wastewater and non-industrial sludge (biosolids) therefrom, as well as the approval of private individual and small on-site sewage treatment and disposal systems.

(1) **Compliance with antidegradation requirements and protection of beneficial uses.**

There is an inherent presumption that adherence to minimum design and construction standards will achieve the objectives of water quality maintenance and support of existing and designated beneficial uses of surface waters and groundwaters. On occasion, water quality-based considerations associated with the attainment and maintenance of higher quality waters, especially relating to dissolved oxygen depletion in receiving waters, may be established through TMDLs requiring a level of sewage treatment more stringent than "secondary." In such cases, construction permitting procedures will ensure that construction permits issued for such systems provide the required level of treatment. Applications for construction permits are reviewed to ensure that new facilities or modifications to existing facilities are not inconsistent with treatment requirements and size restrictions contained in the Water Quality Management Plan.

(2) **Application of USAP.** The making of beneficial use support/impairment determinations for surface waters is not a component of this program area.

(3) **Description of programs affecting water quality.** Minimum water and wastewater system construction standards and biosolids/water plant residuals reuse and disposal standards are found at OACs 252:606, 252:621, 252:626, 252:631, 252:641 and 252:656. These minimum standards have been demonstrated to achieve water treatment and distribution objectives and sewage collection, treatment and disposal objectives on a widespread geographical basis, including the State of Oklahoma. Construction permit applications and sludge management plan applications are required to contain engineering reports, plans, specifications and sludge management or residuals disposal plans sufficient to demonstrate

compliance with these minimum standards for construction or advanced levels of sewage treatment. Local DEQ offices approve the design of private individual and small on-site sewage disposal systems in accordance with OAC 252:641. These systems are inspected and installations are approved by the ECLS Division through its local offices.

(4) **Technical information and procedures for implementation.** Minimum water and wastewater system construction standards and biosolids/water plant residuals reuse and disposal standards are found at OACs 252:606, 252:621, 252:626, 252:631, 252:641 and 252:656.

(5) **Integration of WQSIP into water quality management activities.** The Department will from time to time revise or amend rules concerning construction standards or operational requirements to better protect the quality of waters of the state. Internal policies and guidelines will also be used to integrate the Plan into water and wastewater treatment system permitting activities.

(6) **Compliance with mandated statewide water quality requirements.** Applicable rules for construction permitting and biosolids/residuals beneficial reuse provide for consideration of and compliance with statewide water quality requirements.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** The Department will review groundwater and surface water quality information obtained through monitoring activities conducted by DEQ, OWRB, OCC, USGS, and others as well as site specific information to determine whether groundwater and surface water quality is being impacted.

(m) **EMERGENCY RESPONSE**

This program area is not directly applicable to WQS implementation.

(n) **ENVIRONMENTAL LABORATORY SERVICES**

(1) **Compliance with antidegradation requirements and protection of beneficial uses.** The SEL provides analytical support for DEQ and other state agency programs that seek to define compliance with antidegradation requirements and protection of beneficial uses. The Fish Community Biotrends monitoring program and the Toxics and Reservoirs program may be used to evaluate long-term trends, both positive and negative, in fish population and toxic contaminant concentrations in fish flesh.

(2) **Application of USAP.** The SEL may play a supporting role for other state agency functions which are charged with USAP-related activities. One of the SEL's most significant contributions to USAP efforts is its Fish Community Biotrends monitoring program.

(3) **Description of programs affecting water quality.** The SEL provides essential support for Section 106 pollution control activities, and data produced by the SEL is used extensively in programs funded under Section 106 for areas within DEQ's jurisdiction. It provides support and review of QA Project Plans for all program areas. Laboratories which report results for compliance with NPDES/OPDES permit requirements are required to hold certification from the SEL's laboratory certification unit. The Fish Community Biotrends monitoring program and the Toxics and Reservoirs program may be used to evaluate effects of both point source and nonpoint source discharges on fish populations and the human health aspects of eating fish flesh. The SEL provides support in developing sampling designs, sample analysis, and data analysis for DEQ monitoring activities as well as for private citizens and other state agencies.

The SEL provides analytical support, when needed, for special purpose point source compliance monitoring and evaluation, nonpoint source pollution studies, as well as for the TMDL process. The SEL provides analytical support to the WQD for compliance determination, investigations, remediation-related monitoring and other monitoring related to actual or suspected groundwater pollution by water and wastewater treatment facilities, as well as the land application of both municipal and industrial wastewaters and sludges. The SEL provides analytical support to the LPD for compliance determination, investigations, remediation-related monitoring and other monitoring related to identification of hazardous substances, hazardous waste and solid waste disposal sites, Superfund and Brownfield sites and residuals from past practices of radioactive waste disposal. The SEL provides analytical support to both the LPD and Corp Comm in the regulation of UIC wells. The SEL also provides analytical support to the DEQ and other state environmental agencies for emergency response situations.

(4) **Technical information and procedures for implementation.** The SEL assesses the health of aquatic communities via the formal protocol established in its Fish Community Biotrends monitoring program. It conducts its Toxics and Reservoirs program according to an established sampling and analytical protocol. The SEL is also working towards becoming accredited by NELAC.

(5) **Integration of WQSIP into water quality management activities.** The Laboratory Certification Program and the SEL's move towards NELAC certification will ensure that data of known quality and comparability is available for environmental programs.

(6) **Compliance with mandated statewide water quality requirements.** The Toxics and Reservoirs program is administered as a direct implementation of and is in compliance with the toxics in fish tissue criteria found at OAC 252:730. The SEL also provides a Section 106 supporting role for other DEQ functions which have direct responsibilities for implementing the OWQS and WQS implementation criteria.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** The effectiveness of SEL-rendered services to other Section 106-funded activities is measured largely through the effectiveness of those individual programs. The effectiveness of the Toxics and Reservoirs program, in terms of both initiating and terminating fish tissue consumption alerts, is measured largely by its ability to be communicated to affected consumers and the public at large. Evaluation of the effectiveness of interdivisional and interagency cooperation in investigating possible nonpoint sources and evaluating point source dischargers to determine if they cause or contribute to the alert levels of toxics in fish tissue is provided in part by BUMP data and in part by the effectiveness of the individual programs involved. The effectiveness of the Fish Community Biotrends Monitoring Program is likewise measured in terms of BUMP data as well as the effectiveness of the individual programs involved in investigating causes of changes in aquatic communities.

(o) **HAZARDOUS SUBSTANCES**

Aspects of DEQ's water quality standards implementation related to the regulation of hazardous substances is described in Part II(k), Land Protection.

(p) **WELLHEAD AND SURFACE SOURCE WATER PROTECTION**

This jurisdictional area is subsumed under the WQD's source water protection program, which includes both surface waters and groundwaters.

(1) **Compliance with antidegradation requirements and protection of beneficial uses.** The DEQ source water protection program provides for a focus on water quality antidegradation and protection of beneficial uses for both surface waters and groundwaters.

(2) **Application of USAP.** The making of beneficial use support and impairment determinations for surface waters is not a component of this jurisdictional area.

(3) **Description of programs affecting water quality.** The DEQ's source water protection program has a surface source water protection program which parallels the concept of the existing EPA-approved wellhead protection program, as well as a continuation of the existing wellhead protection program. The delineation process will follow the same format in identifying three protection zones for both surface sources and groundwater sources. Similar procedures and guidelines are used to encourage local participation and implementation.

(4) **Technical information and procedures for implementation.** The WQD Source Water Protection Plan provides the technical guidance and procedures for implementation of this program.

(5) **Integration of WQSIP into water quality management activities.** Integration of the Plan will be through rules and internal WQD policies and guidelines, as well as coordination with other state and federal agencies.

(6) **Compliance with mandated statewide water quality requirements.** The groundwater portion of the Source Water Protection Plan provides a basis for delineation of special source groundwaters. Coordination with other affected entities is addressed in the Source Water Protection Plan.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** Special monitoring may be initiated if potential sources of contamination of groundwater or surface water are identified.

(q) **GROUNDWATER PROTECTION**

(1) Descriptions of groundwater quality protection procedures in the various DEQ program areas are provided in the subsections dealing with Land Protection, Water and Wastewater Treatment Systems, and Wellhead and Surface Source Water Protection.

(2) For those locations identified in OAC 252:730, Appendix H as a limited use groundwater, and there is a request for the use of said groundwater, certain limitations on the extraction and the use of the groundwater apply.

(r) **UTILIZATION AND ENFORCEMENT OF OWQS AND WQS IMPLEMENTATION**

This subsection describes compliance inspection and enforcement activities of permitted point source dischargers and other wastewater treatment facilities conducted by the local ECLS offices and the WQD Municipal and Industrial Enforcement Sections. Utilization of the OWQS and WQS implementation by other DEQ program areas is described under the other jurisdictional areas of this Plan.

(1) **Compliance with antidegradation requirements and protection of beneficial uses.** The WQD Municipal and Industrial Enforcement Sections ensure that antidegradation requirements and protection of beneficial uses is maintained by performing inspections of and, if necessary, taking enforcement action for significant permit violations against OPDES permit

holders. Required inspections, bypass reporting requirements, and procedures for investigating and resolving complaints are directed towards removing threats to water quality, restoration of water quality where beneficial uses are threatened, and maintaining water quality where beneficial uses are supported. Noncompliance with administrative rules and OPDES permits subjects the facility to enforcement action. The WQD Municipal and Industrial Enforcement Sections ensure that wastewater treatment systems comply with antidegradation requirements and protect beneficial uses by monitoring such systems and initiating enforcement action against treatment systems that violate OPDES permit conditions. Total retention (non-discharging) lagoon systems are inspected by ECLS to ensure the systems are being properly maintained. Systems that land apply wastewater or sludge are inspected to ensure the systems follow the technical requirements and criteria in their land application permits and/or sludge management plans. Systems which are not properly maintaining and operating their systems based on these inspections are subject to enforcement action.

(2) **Application of USAP.** The making of beneficial use support/impairment determinations for surface waters is not a component of this jurisdictional area.

(3) **Description of programs affecting water quality.** All OPDES permittees are subject to inspections of facilities to ensure that they are being properly operated and maintained. Additionally, permit holders are required to implement a self-monitoring program and submit analytical results to the DEQ as required by each facility's OPDES permit. These results are received monthly, logged into the PCS or ICIS database, and reviewed to ensure compliance with the OPDES permit. All unpermitted system bypasses are required to be reported in order to track which facilities may be experiencing collection system or treatment facility overloading problems. The WQD Municipal and Industrial Enforcement Sections are an integral part of the environmental complaint process, bearing the responsibility of investigating and carrying out enforcement action when necessary, often in conjunction with environmental specialists from the ECLS Division's local county offices. ECLS Division environmental specialists in the local DEQ offices conduct inspections of all permitted wastewater facilities at a prescribed frequency. When significant violations are identified, notices to comply are issued by the local DEQ office and follow up inspections are conducted within two weeks. If the violation persists, the facility is referred to the WQD to initiate formal enforcement procedures. Violations of on-site sewage regulations (OAC 252:641) are identified both through the inspection of system installations and through the investigation of complaints of surfacing or discharging sewage. In both cases, the ECLS Division and the WQD have implemented standard enforcement procedures including NOV's, CO's and AO's designed to ensure prompt return to compliance by violators. Methods of monitoring systems include inspections, review of bypass reports and review of discharge monitoring reports. Additionally, the environmental complaint process is effective in determining systems which may pose threats to water quality. Systems which do not discharge wastewater are routinely inspected and enforcement action is taken if the system is not properly maintained. All treatment systems are required to comply with their OPDES permit and failure to comply subjects the system to enforcement action.

(4) **Technical information and procedures for implementation.** Facility performance is monitored through inspections, DMRs, bypass reports and the filing of environmental complaints. One or more of these systems may be used to initiate enforcement action against a facility as they may identify a failure of the facility to comply with permit requirements and state or federal regulations. Enforcement actions may include an NOV, CO or AO.

Enforcement actions may involve compliance schedules, which are tracked through a database and reviewed monthly to ensure compliance with the tasks required to bring the system into compliance. The ECLS Division has established procedures for facilities found not in compliance with applicable regulations. Typically, when the ECLS environmental specialist identifies a critical violation, he/she issues the facility a written warning to correct the situation within two weeks. If the facility remains non-compliant after two weeks, the facility is referred to the Water Quality Division to initiate formal enforcement action. ECLS has developed a procedure to ensure compliance with on-site sewage regulations. Non-compliance may result from either installation deficiencies found during the construction inspection or from cases of surfacing sewage found during investigations of complaints. In either case, if an NOV and follow-up inspection do not result in the system coming back into compliance, the owner of the system may be subjected to other enforcement actions.

(5) **Integration of WQSIP into water quality management activities.** To the extent integration of the Plan requires the Department to establish policies of general applicability and future effect, that implement statutory language, or that describe the procedure and practice before the DEQ, the DEQ will promulgate such policies through the rule making provisions of the Administrative Procedures Act. Rules will be added or amended as appropriate to the various chapters of the DEQ's existing rules.

(6) **Compliance with mandated statewide water quality requirements.** The WQD Municipal and Industrial Enforcement Sections' water quality management activities comply with applicable statewide water quality requirements by enforcing adherence to the effluent limitations and other special conditions contained in OPDES permits, which are based on the WQMP, CPP, OWQS and WQS implementation criteria.

(7) **Public and interagency participation.** Part III of this appendix contains a summary of comments received and responses thereto relating to promulgation of DEQ's WQSIP.

(8) **Evaluation of effectiveness of agency activities.** EPA Region 6 oversees the water quality management activities of the WQD Municipal and Industrial Enforcement Sections for major dischargers, including CEIs, enforcement activities and compliance schedules.

(s) **ENVIRONMENTAL REGULATION, POLLUTION CONTROL AND ABATEMENT.**

This program area is related to the assumption of jurisdiction by the DEQ of surface water and groundwater pollution issues not subject to the statutory authority of other state environmental agencies. Such issues would be subsumed under other program areas in this Plan. Thus, this program area is not directly applicable to WQS implementation.

(t) **PUBLIC AND PRIVATE WATER SUPPLIES.**

This program area is related to drinking water supplies and treatment and thus is not directly applicable to WQS implementation.

(u) **AIR QUALITY.**

This program area is not directly applicable to WQS implementation.

(v) **COMPUTERIZED WATER QUALITY DATA INFORMATION SYSTEM.**

This program area is not directly applicable to WQS implementation.

PART III. PUBLIC AND INTERAGENCY PARTICIPATION

(a) **GENERAL.**

(1) **Initial promulgation of Plan.** The initial promulgation of the Plan will receive public and interagency review and comment. This required element will be completed when the public participation period has been completed and a response to all comments received as a result of the public participation process has been appended to the Plan.

(2) **Revisions to Plan.** As with initial promulgation, triennial reviews of and revisions to the Plan, as well as any intermediate revisions thereto, shall undergo public and interagency review, and the response to all comments received shall be appended to the Plan.

(b) **SUMMARY OF COMMENTS RECEIVED AND RESPONSE TO COMMENTS.**

APPENDIX B. PRIORITY AND NONPRIORITY POLLUTANTS WITH NUMERICAL CRITERIA REQUIRING REASONABLE POTENTIAL SCREENING

The priority pollutants are listed in Table B-1. Those having state numerical criteria or federal numerical guidelines for the consumption of fish flesh (re: NRWQC), and which require reasonable potential screening if present in an effluent are marked with a diamond (♦). Pollutants with state numerical criteria are indicated according to type of criteria. Pollutants which have NRWQC human health/fish flesh guidelines are screened only if the Fish Consumption beneficial use applies to the discharge and there is no state criterion for the pollutant. Predicted exceedances of NRWQC guidelines will result in effluent and/or background monitoring. Nonpriority pollutants with state and federal criteria are listed in Table B-2. WET testing parameters and their STORET numbers are listed in Table B-3.

Table B-1. Priority Pollutants with State Water Quality Criteria or National Recommended Water Quality Criteria Requiring Reasonable Potential Screening

Pollutant	CAS No.	STORET No.	MQL (µg/l)	NRWQC Human Health ¹	State Criteria ²			
					Aquatic Toxicity	Human Health	Raw Water	Agriculture
Metals, Cyanide and Total Phenols	Antimony, total	7440360	01097	60	♦	---	---	---
	Arsenic, total	7440382	01002	0.5	♦	♦	♦	---
	Beryllium, total	7440417	01012	5	---	---	---	---
	Cadmium, total	7440439	01027	1	---	♦	♦	---
	Chromium, total	7440473	01034	10	---	♦	♦	---
	Chromium (3+)	16065831	01033	10				
	Chromium (6+)	18540299	01032	10				
	Copper, total	7440508	01042	1	♦	♦	---	---
	Lead, total	7439921	01051	0.5	---	♦	♦	---
	Mercury, total	7439976	71900	0.05	♦	♦	♦	---
	Nickel, total	7440020	01067	10	♦	♦	---	---
	Selenium, total	7782492	01147	5	♦	♦	---	---
	Silver, total	7440224	01077	0.5	---	♦	♦	---
	Thallium, total	7440280	01059	0.5	♦	♦	---	---
	Zinc, total	7440666	01092	20	♦	♦	---	---
	Cyanide, total	57125	00720	10	♦	♦	---	---
	Phenols, total	108952	46000	10	---	---	♦	---
	2,3,7,8-Tetrachlorodibenzo-p Dioxin	1746016	34675	0.00001	♦	---	♦	---

¹ From National Recommended Water Quality Criteria, Pub. No. EPA 822-Z-99-001, April 1999

² DEQ-adopted numerical water quality criteria, OAC 252:730, Subchapter 5

Table B-1 (continued). Priority Pollutants with State Water Quality Criteria or National Recommended Water Quality Criteria Requiring Reasonable Potential Screening

	Pollutant	CAS No.	STORE T No.	MQL (µg/l)	NRWQC Human Health ¹	State Criteria ²			
						Aquatic Toxicity	Human Health	Raw Water	Agriculture
Volatile Organics	Acrolein	107028	34210	50	◆	---	◆	---	---
	Acrylonitrile	107131	34215	50	◆	◆	◆	---	---
	Benzene	71432	34030	10	◆	◆	◆	---	---
	Bromoform	75252	32104	10	◆	---	---	---	---
	Carbon Tetrachloride	56235	32102	10	◆	---	◆	---	---
	Chlorobenzene	108907	34301	10	◆	---	---	---	---
	Chlorodibromomethane	124481	32105	10	◆	---	---	---	---
	Chloroethane	75003	34311	50	---	---	---	---	---
	2-Chloroethylvinyl ether	110758	34576	10	---	---	---	---	---
	Chloroform	67663	32106	10	◆	---	◆	---	---
	Dichlorobromomethane	75274	32101	10	◆	---	◆	---	---
	1,1-Dichloroethane	75343	34496	10	---	---	---	---	---
	1,2-Dichloroethane	107062	34536	10	◆	---	---	---	---
	1,1-Dichloroethylene	75354	34501	10	◆	---	---	---	---
	1,2-Dichloropropane	78875	34541	10	◆	---	---	---	---
	1,3-Dichloropropylene	542756	34561	10	◆	---	---	---	---
	Ethylbenzene	100414	34371	10	◆	---	◆	---	---
	Methyl bromide [Bromomethane]	74839	34413	50	◆	---	---	---	---
	Methyl chloride [Chloromethane]	74873	34418	50	---	---	---	---	---
	Methylene chloride	75092	34423	20	◆	---	---	---	---
	1,1,2,2-Tetrachloroethane	79345	34516	10	◆	---	---	---	---
	Tetrachloroethylene	127184	34475	10	◆	◆	◆	---	---
	Toluene	108883	34010	10	◆	◆	◆	---	---
	1,2-Trans-dichloroethylene	156605	34546	10	◆	---	---	---	---
	1,1,1-Trichloroethane [1-1-1 TCE]	71556	34506	10	---	---	◆	---	---
	1,1,2-Trichloroethane	79005	34511	10	◆	---	---	---	---
	Trichloroethylene	79016	39180	10	◆	---	---	---	---
	Vinyl chloride	75014	39175	10	◆	---	---	---	---

¹ From National Recommended Water Quality Criteria, Publication No. EPA 822-Z-99-001, April 1999

² DEQ-adopted numerical water quality criteria, OAC 252:730, Subchapter 5

Table B-1 (continued). Priority Pollutants with State Water Quality Criteria or National Recommended Water Quality Criteria Requiring Reasonable Potential Screening

	Pollutant	CAS No.	STORE T No.	MQL (mg/l)	NRWQC Human Health ¹	State Criteria ²			
						Aquatic Toxicity	Human Health	Raw Water	Agriculture
Acid Organics	2-Chlorophenol	95578	34586	20	◆	---	---	---	---
	2,4-Dichlorophenol	120832	34601	20	◆	---	---	---	---
	2,4-Dimethylphenol	105679	34606	20	◆	---	---	---	---
	4,6-Dinitro-o-cresol [2-Methyl-4,6-dinitrophenol]	534521	34657	50	◆	---	---	---	---
	2,4-Dinitrophenol	51285	34616	50	◆	---	---	---	---
	2-Nitrophenol	88755	34591	20	---	---	---	---	---
	4-Nitrophenol	100027	34646	50	---	---	---	---	---
	p-Chloro-m-cresol	59507	34452	20	---	---	---	---	---
	Pentachlorophenol	87865	39032	50	◆	◆	◆	---	---
	Phenol	108952	34694	20	◆	---	---	---	---
	2,4,6-Trichlorophenol	88062	34621	20	◆	---	---	---	---
	Acenaphthene	83329	34205	20	---	---	---	---	---
Base / Neutral Organics	Acenaphthylene	208968	34200	20	---	---	---	---	---
	Anthracene	120127	34220	20	◆	---	---	---	---
	Benzidine	92875	39120	50	◆	---	---	◆	---
	Benzo(a)anthracene	56553	34526	20	◆	---	---	---	---
	Benzo(a)pyrene	50328	34247	20	◆	---	---	---	---
	Benzo(b)fluoranthene [3,4-Benzofluoranthene]	205992	34230	20	◆	---	---	---	---
	Benzo(ghi)perylene	191242	34521	20	---	---	---	---	---
	Benzo(k)fluoranthene	207089	34242	20	◆	---	---	---	---
	Bis (2-chloroethoxy) methane	111911	34278	20	---	---	---	---	---
	Bis (2-chloroethyl) ether	111444	34273	20	◆	---	---	---	---
	Bis (2-chloroisopropyl) ether	39638329	34283	20	◆	---	---	---	---
	Bis (2-ethylhexyl) phthalate	117817	39100	20	◆	---	◆	---	---
	4-Bromophenyl phenyl ether	101553	34636	20	---	---	---	---	---
	Butylbenzyl phthalate	85687	34292	20	◆	---	◆	◆	---
	2-Chloronaphthalene	91587	34581	20	◆	---	---	---	---
	4-Chlorophenyl phenyl ether	7005723	34631	20	---	---	---	---	---
	Chrysene	218019	34320	20	◆	---	---	---	---
	Dibenzo(a,h)anthracene	53703	34556	20	◆	---	---	---	---
	1,2-Dichlorobenzene	95501	34536	20	◆	---	---	---	---
	1,3-Dichlorobenzene	541731	34566	20	◆	---	---	---	---

¹ From National Recommended Water Quality Criteria, Publication No. EPA 822-Z-99-001, April 1999

² DEQ-adopted numerical water quality criteria, OAC 252:730, Subchapter 5

Table B-1 (continued). Priority Pollutants with State Water Quality Criteria or

National Recommended Water Quality Criteria Requiring Reasonable Potential Screening

	Pollutant	CAS No.	STORE T No.	MQL (µg/l)	NRWQC Human Health ¹	State Criteria ²			
						Aquatic Toxicity	Human Health	Raw Water	Agriculture
Base / Neutral Organics	1,4-Dichlorobenzene	106467	34571	20	◆	---	---	---	---
	3,3'-Dichlorobenzidine	91941	34631	20	◆	---	---	---	---
	Diethyl phthalate	84662	34336	20	◆	---	◆	---	---
	Dimethyl phthalate	131113	34341	20	◆	---	◆	---	---
	Di-n-butyl phthalate	84742	39110	20	◆	---	◆	---	---
	2,4-Dinitrotoluene	121142	34611	20	◆	---	---	---	---
	2,6-Dinitrotoluene	606202	34626	20	---	---	---	---	---
	Di-n-octyl phthalate	117840	34596	20	---	---	---	---	---
	1,2-Diphenylhydrazine (as Azobenzene)	122667	34346	20	◆	---	---	---	---
	Fluoranthene	206440	34376	20	◆	---	---	---	---
	Fluorene	86737	34381	20	◆	---	---	---	---
	Hexachlorobenzene	118741	39700	10	◆	---	◆	---	---
	Hexachlorobutadiene	87683	34391	20	◆	---	---	---	---
	Hexachlorocyclopentadiene	77474	34386	20	◆	---	---	---	---
	Hexachloroethane	67721	34396	20	◆	---	---	---	---
	Ideno (1,2,3-cd) pyrene	193395	34403	20	◆	---	---	---	---
	Isophorone	78591	34408	20	◆	---	---	---	---
	Naphthalene	91203	34696	10	---	---	---	---	---
	Nitrobenzene	98953	34447	20	◆	---	---	---	---
	n-Nitrosodimethylamine	62759	34438	50	◆	---	---	---	---
	n-Nitrosodi-n-propylamine	621647	34428	20	◆	---	---	---	---
	n-Nitrosodiphenylamine	86306	34433	20	◆	---	---	---	---
	Phenanthrene	85018	34461	20	---	---	---	---	---
	Pyrene	129000	34469	20	◆	---	---	---	---
	1,2,4-Trichlorobenzene	120821	34551	20	◆	---	---	---	---
Pesticides	Aldrin	309002	39330	0.05	◆	◆	◆	---	---
	alpha-BHC	319846	39337	0.05	◆	---	---	---	---
	beta-BHC	319857	39338	0.05	◆	---	---	---	---
	gamma-BHC [Lindane]	58899	34266	0.05	◆	◆	◆	◆	---
	delta-BHC	319868	34259	0.05	---	---	---	---	---
	Chlordane	57749	39350	0.2	◆	◆	◆	---	---
	4,4'-DDT	50293	39300	0.05	◆	◆	◆	---	---
	4,4'-DDE	72559	39320	0.05	◆	---	---	---	---

¹ From National Recommended Water Quality Criteria, Publication No. EPA 822-Z-99-001, April 1999

² DEQ-adopted numerical water quality criteria, OAC 252:730, Subchapter 5

Table B-1 (continued). Priority Pollutants with State Water Quality Criteria or National Recommended Water Quality Criteria Requiring Reasonable Potential Screening

Pollutant	CAS No.	STORE T No.	MQL (µg/l)	NRWQC Human Health ¹	State Criteria ²			
					Aquatic Toxicity	Human Health	Raw Water	Agriculture
Pesticides	4,4'-DDD	72548	39310	0.05	◆	---	◆	---
	Demeton			1				
	Diazinon			1				
	Dieldrin	60571	39380	0.05	◆	◆	◆	---
	alpha-Endosulfan	959988	34361	0.05	◆	◆	---	---
	beta-Endosulfan	33213659	34356	0.05	◆	◆	---	---
	Endosulfan sulfate	1031078	34351	0.05	◆	---	---	---
	Endrin	72208	39390	0.05	◆	◆	◆	---
	Endrin aldehyde	7421934	34366	0.05	◆	---	---	---
	Heptachlor	76448	39410	0.05	◆	◆	◆	---
	Heptachlor epoxide	1024573	39420	0.05	◆	---	---	---
	Toxaphene	8001352	39400	0.3	◆	◆	---	---
PCBs	PCB-1242		39496	0.25	---	---	---	---
	PCB-1254		39504	0.25	---	---	---	---
	PCB-1221		39488	0.25	---	---	---	---
	PCB-1232		39492	0.25	---	---	---	---
	PCB-1248		39500	0.25	---	---	---	---
	PCB-1260		39508	0.25	---	---	---	---
	PCB-1016		34671	0.25	---	---	---	---
	PCBs, total		04166	0.25	◆	◆	◆	---
	2,4,5 – TP (Silvex)			0.25				

¹ From National Recommended Water Quality Criteria, Publication No. EPA 822-Z-99-001, April 1999

² DEQ-adopted numerical water quality criteria, OAC 252:730, Subchapter 5

Table B-2. Nonpriority Pollutants with State Water Quality Criteria or National Recommended Water Quality Criteria Requiring Reasonable Potential Screening

Pollutant	CAS No.	STORE T No.	MQL (µg/l)	NRWQC Human Health ¹	State Criteria ²			
					Aquatic Toxicity	Human Health	Raw Water	Agriculture
Nonpriority Pollutants	Ammonia	7664417	00610	100	---	³	---	---
	Asbestos	1332214	948	---	◆	---	---	---
	Barium	7440393	01007	10	◆	---	◆	---
	Bis-chloromethyl ether	542881	34268	20	◆	---	---	---
	Chloride	16887006	941	10000	---	---	---	◆
	Chlorine	7782505	50060	100	---	³	---	---
	2-(2,4,5-Trichlorophenoxy) propionic acid [2,4,5-TP Silvex]	93721	39760	0.5	---	◆	---	◆
	2,4-Dichlorophenoxyacetic acid [2,4-D]	94757	39730	1	---	---	---	◆
	Chlorpyrifos [Dursban]	2921882	81403	0.05	---	◆	---	---
	Demeton	8065483	39560	1	---	◆	---	---
	Detergents, total		51582	100	---	---	---	◆
	Diazinon	333415	10408	1	---	◆	---	---
	Fluoride @ 90° F	16984488	951	1000	---	---	---	◆
	Guthion [Methyl azinphos]	86500	39580	1	---	◆	---	---
	Hexachlorocyclohexane-Technical	319868	77835	5	◆	---	---	---
	Hexahydro-1,3,5-trinitro-1,3,5-triazine [RDX]	121824	81364	140	---	◆	---	---
	Iron	7439896	00980	200	◆	---	---	---
	Malathion	121755	39530	1	---	◆	---	---
	Manganese	7439965	01055	50	◆	---	---	---
	Methoxychlor	72435	39480	0.05	◆	◆	---	◆
	Methylene blue active substances	61734	47021	100	---	◆	---	◆
	Mirex	2385855	39755	0.05	---	◆	---	---
	Nitrate	14797558	00620	50	◆	---	---	◆
	Nitrosamines		---	50	◆	---	---	---
	n-Nitrosodibutylamine	924163	78207	50	◆	---	---	---

¹From National Recommended Water Quality Criteria, Publication No. EPA 822-Z-99-001, April 1999.

²DEQ-adopted numerical water quality criteria, OAC 252:730, Subchapter 5.

³Ammonia and chlorine criteria apply to implementation of narrative toxicity criterion under OAC 252:730 and 40 CFR Part 122.44(d)(1)(vi).

Table B-2 (continued). Nonpriority Pollutants with State Water Quality Criteria or National Recommended Water Quality Criteria Requiring Reasonable Potential Screening

Pollutant	CAS No.	STORE T No.	MQ L (µg/l)	NRWQC Human Health ¹	State Criteria ²			
					Aquatic Toxicity	Human Health	Raw Water	Agriculture
Nonpriority Pollutants	n-Nitrosodiethylamine	55185	78200	50	◆	---	---	---
	n-Nitrosopyrrolidine	930552	78206	50	◆	---	---	---
	Nonylphenol	25154523	10395	100	---	◆	---	---
	Parathion	56382	39540	1	---	◆	---	---
	Pentachlorobenzene	608935	77793	50	◆	---	---	---
	Perchlorate	7601903	3215	5	---	◆	◆	---
	Phthalate esters (except butylbenzyl)		39117	---	---	---	◆	---
	Sulfate		00946	10000	---	---	---	◆
	Total Dissolved Solids [TDS]		70300	10000	---	---	---	◆
	1,2,4,5-Tetrachlorobenzene	95943	78028	50	◆	---	---	---
	2,4,5-Trichlorophenol	95954	81848	50	◆	---	---	---
	2,4,6-Trinitrotoluene		81360	---	---	◆	---	---

¹From National Recommended Water Quality Criteria, Publication No. EPA 822-Z-99-001, April 1999.

²DEQ-adopted numerical water quality criteria, OAC 252:730, Subchapter 5.

Table B-3. WET Testing and WET Limit Parameters

Pollutant			STORE T No.	NRWQC Human Health ¹	State Criteria ²			
					Aquatic Toxicity	Human Health	Raw Water	Agriculture
48-hour Acute LC50, Static Renewal, Freshwater	Daphnia magna	P/F survival	TIM3C	---	◆	---	---	---
		LC50 effluent concentration	TAM3C	---	◆	---	---	---
		% mortality in 100% effluent	TJM3C	---	◆	---	---	---
	Daphnia pulex	P/F survival	TIM3D	---	◆	---	---	---
		LC50 effluent concentration	TAM3D	---	◆	---	---	---
		% mortality in 100% effluent	TJM3D	---	◆	---	---	---
	Pimephales promelas	P/F survival	TIM6C	---	◆	---	---	---
		LC50 effluent concentration	TAM6C	---	◆	---	---	---
		% mortality in 100% effluent	TJM6C	---	◆	---	---	---
	WET Limit	LC50 > 100%	22414	---	◆	---	---	---
7-day Chronic NOEC, Static Renewal, Freshwater	Ceriodaphnia dubia	P/F survival	TLP3B	---	◆	---	---	---
		NOECL (lethality)	TOP3B	---	◆	---	---	---
		% mortality in critical dilution	TJP3B	---	◆	---	---	---
		P/F reproduction	TGP3B	---	◆	---	---	---
		NOECS (reproduction)	TPP3B	---	◆	---	---	---
		% CV	TQP3B	---	◆	---	---	---
	Pimephales promelas	P/F survival	TLP6C	---	◆	---	---	---
		NOECL (lethality)	TOP6C	---	◆	---	---	---
		% mortality in critical dilution	TJP6C	---	◆	---	---	---
		P/F growth	TGP6C	---	◆	---	---	---
		NOECS (growth)	TPP6C	---	◆	---	---	---
		% CV	TQP6C	---	◆	---	---	---
	WET Limit	NOECL ≥ critical dilution	22414	---	◆	---	---	---

¹ From National Recommended Water Quality Criteria, Publication No. EPA 822-Z-99-001, April 1999.

² DEQ-adopted numerical water quality criteria, OAC 252:730, Subchapter 5.

APPENDIX C. METHODOLOGY AND EQUATIONS FOR CHARACTERIZING EFFLUENT AND BACKGROUND CONCENTRATIONS IN DETERMINATION OF REASONABLE POTENTIAL TO EXCEED NUMERICAL CRITERIA

I. EFFLUENT

A. Measures of central tendency. $C_{E(\text{mean})}$ represents the mean of an effluent distribution. $C_{E(\text{mean})}$ is a geometric mean, unless the geometric mean is not determinable in which case an arithmetic mean is used. Where one or the other form of the mean must be used in an equation, that form is explicitly stated.

(1) **$C_{E(\text{avg})}$.** $C_{E(\text{avg})}$ is calculated as follows:

$$C_{E(\text{avg})} = \frac{\left(\sum_{i=1}^N x_i \right)}{N} \quad [\text{C-1}]$$

(2) **$C_{E(\text{geomean})}$.** $C_{E(\text{geomean})}$ is calculated according to either of the following two forms, which are equivalent.

$$C_{E(\text{geomean})} = \text{EXP} \left(\frac{\left(\sum_{i=1}^N \ln(x_i) \right)}{N} \right) = \sqrt[N]{\prod_{i=1}^N x_i} \quad [\text{C-2}]$$

B. Effluent variability. An effluent data set's standard deviation is the primary measure of its variability. Generally, as the mean of an effluent distribution increases, its standard deviation also tends to increase. The coefficient of variation is a measure of a data set's variability relative to its arithmetic mean.

(1) **Standard deviation of untransformed effluent data set (s_x).** The standard deviation of an untransformed effluent data set is calculated as follows:

$$s_x = \sqrt{\frac{N \sum_{i=1}^N (x_i^2) - \left(\sum_{i=1}^N x_i \right)^2}{N(N-1)}} \quad [\text{C-3}]$$

where N is the number of data points in the effluent data set.

(2) **Standard deviation of log-transformed effluent data set ($s_{\ln(x)}$).** The standard deviation of a log-transformed effluent data set is calculated as follows:

$$s_{\ln(x)} = \sqrt{\frac{N \sum_{i=1}^N (\ln(x_i))^2 - \left(\sum_{i=1}^N \ln(x_i) \right)^2}{N(N-1)}} , \quad [\text{C-4}]$$

where N is the number of data points in the effluent data set.

The standard deviation of a log-transformed data set applies only to the transformed data set and cannot be translated back into an equivalent untransformed data set standard deviation, for example:

$$\text{EXP}(s_{\ln(x)}) \neq s_x$$

(3) **CV.** The CV of an untransformed data set is calculated as follows, when using at least ten (10) data points (if less than ten (10) data points are available, a value of 0.6 is assumed):

$$\text{CV} = \frac{s_x}{C_{E(\text{avg})}} , \quad [\text{C-5}]$$

where $C_{E(\text{avg})}$ and s_x are determined according to Equations C-1 and C-3, respectively.

C. C₉₅ and C_{95(M)}. The use of both C₉₅ and C_{95(M)} assumes a log-normal effluent distribution. For the purpose of determining whether **effluent limitations** are required, C₉₅ represents the 95th percentile effluent concentration. For the purpose of determining whether further **effluent monitoring** is required, if C₉₅ does not exhibit reasonable potential then C_{95(M)} is used.

(1) **C₉₅.** The method by which C₉₅ is determined is dependent on whether there are 10 or more data points available.

(a) **Less than 10 data points available.** The mean effluent concentration ($C_{E(\text{mean})}$) is multiplied by a reasonable potential factor (RPF₉₅), which represents the 95th percentile maximum likelihood estimator for a log-normal distribution, according to Equation C-6. If only one data point is available, it is assumed to represent the effluent mean. RPF₉₅ is calculated according to Equation C-7, assuming a CV of 0.6.

$$C_{95} = C_{E(\text{mean})} \times \text{RPF}_{95} \quad [\text{C-6}]$$

$$\text{RPF}_{95} = \text{EXP} \left(1.645 \sqrt{\ln(1 + \text{CV}^2)} - 0.5 \ln(1 + \text{CV}^2) \right) \quad [\text{C-7}]$$

Since a CV of 0.6 is assumed, RPF₉₅ = 2.135 and Equation C-6 reduces to $C_{95} = C_{E(\text{mean})} \times 2.135$. Where determinable, the geometric mean, $C_{E(\text{geomean})}$, shall be used as $C_{E(\text{mean})}$.

in Equation C-6. The arithmetic mean, $C_{E(avg)}$, may be used if the geometric mean is unknown or undeterminable.

(b) **Ten or more data points available.** C_{95} is obtained directly from the data set as the inverse of the cumulative log-normal distribution function at a 95% probability using Equation C-8.

$$C_{95} = \text{EXP} \left(\ln(x)_{\text{avg}} + 1.645 \times s_{\ln(x)} \right) \quad [\text{C-8}]$$

where $\ln(x)_{\text{avg}}$ is the arithmetic mean of the log-transformed effluent data set and $s_{\ln(x)}$ is the standard deviation of the log-transformed effluent data set.

(2) **$C_{95(M)}$.** The smaller the size of an effluent data set, the greater the uncertainty of its distribution. The extreme case occurs where only one data point is available. Where less than 10 data points are available to determine C_{95} , further effluent monitoring may be warranted for the purpose of future reevaluation of reasonable potential. The method used, referred to as the TSD method, is described in Section 3.3.2 of Technical Support Document for Water Quality-Based Toxics Control, EPA Publication No. EPA/505/2-90-001, March 1991. A log-normal distribution and a CV of 0.6 are assumed. $C_{95(M)}$ is calculated according to Equation C-9.

$$C_{95(M)} = C_{E(\text{max})} \times \text{RPF}_{95(M)} \quad [\text{C-9}]$$

$C_{E(\text{max})}$ is the highest concentration of a toxicant in its effluent data set. If only one data point is available, it is considered to be $C_{E(\text{max})}$. $\text{RPF}_{95(M)}$ is determined at a 95% confidence level and a 95% probability basis, according to Equation C-10.

$$\text{RPF}_{95(M)} = \frac{\text{EXP} \left(1.645 \sqrt{\ln(1 + \text{CV}^2)} - 0.5 \ln(1 + \text{CV}^2) \right)}{\text{EXP} \left(z_N \sqrt{\ln(1 + \text{CV}^2)} - 0.5 \ln(1 + \text{CV}^2) \right)} \quad [\text{C-10}]$$

where z_N is the upper k^{th} percentile of the normal distribution, $k = (1 - \text{confidence level})^{1/N} = (0.05)^{1/N}$ for the 95% confidence level, and $\text{CV} = 0.6$.

Table C-1 lists $RPF_{95(M)}$ values for values of N from 1 to 9, where CV is assumed to be 0.6.

Table C-1. $RPF_{95(M)}$ and z_N Values for $N < 10$

N	z_N	$RPF_{95(M)}$
1	-1.645	6.199
2	-0.760	3.795
3	-0.336	3.000
4	-0.068	2.585
5	0.124	2.324
6	0.272	2.141
7	0.390	2.006
8	0.489	1.898
9	0.574	1.811

(II) **BACKGROUND (C_B).**

(A) Numerical criteria for toxic substances: As described in OAC 252:690-3-11 and 14, C_B is the background concentration representative of low stream flow (7Q2) conditions.

(B) Human health and raw water criteria. As described in OAC 252:690-3-11 and 15, C_B is the long term background concentration representative of average stream flow conditions, and is expressed as a geometric mean.

(C) Agriculture criteria. As described in OAC 252:690-3-11 and 16, if site-specific mineral constituent background data is used (as opposed to the historical YMS and SS criteria in Appendix F of OAC 252:730), C_B is calculated as the arithmetic average of the site-specific background data distribution. If historical YMS and SS data from Appendix F of OAC 252:730 are used, C_B is calculated according to Equation C-11.

$$C_B = 2 \times C_{B(YMS)} - C_{B(SS)} \quad [C-11]$$

APPENDIX D. WHOLE EFFLUENT TOXICITY (WET) TESTING CRITICAL DILUTIONS AND DILUTION SERIES

The narrative toxicity criterion is implemented according to procedures in OAC 252:740 and OAC 252:690-3-17 through 3-43. Critical dilutions are expressed in terms of percent effluent. Both types of WET testing require that test organisms be subjected to a series of effluent dilutions based on the critical dilution. Tables D-1 and D-2 reflect the 0.75 dilution series to be used for each percent critical dilution. For WET testing purposes, Q_e is the design flow for a municipal POTW or the highest monthly average flow over the most recent two year period of record for an industrial facility. Q_u is the higher of the 7Q2 or 1cfs. $Q^* = Q_e/Q_u$.

- (1) **Acute WET testing critical dilution.** The ACD is 100%.
- (2) **Chronic WET testing critical dilution for streams.** Equations for calculating the CCD are as follows:

$$CCD = 100 \times \frac{1.94 Q^*}{(1 + Q^*)}, \text{ where } Q^* \leq 0.1823. \quad [D-1]$$

$$CCD = 100 \times \frac{1}{(6.17 - 15.51 Q^*)}, \text{ where } 0.1823 < Q^* < 0.3333. \quad [D-2]$$

$$CCD = 100, \text{ where } Q^* \geq 0.3333. \quad [D-3]$$

Table D-1. 0.75 Dilution Series for Critical Dilutions from 10% through 75%

Percent Effluent					
Dilution 1	Dilution 2	Dilution 3	Dilution 4 (Critical Dil)	Dilution 5	Dilution 6
4.2	5.6	7.5	10	13	---
4.6	6.2	8.3	11	15	---
5.1	6.8	9.0	12	16	---
5.6	7.5	10	13	17	---
5.9	7.9	11	14	19	---
6.3	8.4	11	15	20	---
6.8	9.0	12	16	21	---
7.2	9.6	13	17	23	---
7.6	10	14	18	24	---
8.0	11	14	19	25	---
8.4	11	15	20	27	---
9.0	12	16	21	28	---
9.3	12	17	22	29	---
9.7	13	17	23	31	---
10	14	18	24	32	---
11	14	19	25	33	---
11	15	20	26	35	---
11	15	20	27	36	---
12	16	21	28	37	---
12	16	22	29	39	---
13	17	23	30	40	---
13	17	23	31	41	---
14	18	24	32	43	---
14	19	25	33	44	---
14	19	26	34	45	---
15	20	26	35	47	---
15	20	27	36	48	---
16	21	28	37	49	---
16	21	29	38	51	---
16	22	29	39	52	---
17	23	30	40	53	---
17	23	31	41	55	---
18	24	32	42	56	---
18	24	32	43	57	---
19	25	33	44	59	---
19	25	34	45	60	---
19	26	35	46	61	---
20	26	35	47	63	---
20	27	36	48	64	---

Table D-1 (continued). 0.75 Dilution Series for Critical Dilutions from 10% through 75%

Percent Effluent					
Dilution 1	Dilution 2	Dilution 3	Dilution 4 (Critical Dil)	Dilution 5	Dilution 6
21	28	37	49	65	---
21	28	38	50	67	---
22	29	38	51	68	---
22	29	39	52	69	---
22	30	40	53	71	---
23	30	41	54	72	---
23	31	41	55	73	---
24	32	42	56	75	---
24	32	43	57	76	---
24	33	44	58	77	---
25	33	44	59	79	---
25	34	45	60	80	---
26	34	46	61	81	---
26	35	47	62	83	---
27	35	47	63	84	---
27	36	48	64	85	---
27	37	49	65	87	---
28	37	50	66	88	---
28	38	50	67	89	---
29	38	51	68	91	---
29	39	52	69	92	---
30	39	53	70	93	---
30	40	53	71	95	---
30	41	54	72	96	---
31	41	55	73	97	---
31	42	56	74	99	---
32	42	56	75	100	---

Table D-2. 0.75 Dilution Series for Critical Dilutions Above 75%

Percent Effluent					
Dilution 1	Dilution 2	Dilution 3	Dilution 4	Dilution 5 (Critical Dil)	Dilution 6

24	32	43	57	76	100
24	32	43	58	77	100
25	33	44	59	78	100
25	33	44	59	79	100
25	34	45	60	80	100
26	34	46	61	81	100
26	35	46	62	82	100
26	35	47	62	83	100
27	35	47	63	84	100
27	36	48	64	85	100
27	36	48	65	86	100
28	37	49	65	87	100
28	37	50	66	88	100
28	38	50	67	89	100
28	38	51	68	90	100
29	38	51	68	91	100
29	39	52	69	92	100
29	39	52	70	93	100
30	40	53	71	94	100
30	40	53	71	95	100
30	41	54	72	96	---
31	41	55	73	97	---
31	41	55	74	98	---
31	42	56	74	99	---
32	42	56	75	100	---

**APPENDIX E. EQUATIONS FOR IMPLEMENTATION OF
TEMPERATURE CRITERIA TO PROTECT THE FISH AND WILDLIFE
PROPAGATION BENEFICIAL USE**

(1) **General.** The temperature criterion is implemented according to procedures in OAC 252:740 and OAC 252:690-3-44 through 3-50. Wasteload allocation, criterion long term average and permit limit development equations are described in this appendix.

(2) **Reasonable potential.**
See OAC 252:740.

(3) **WLA_T.** Trout fisheries by definition require a WLA_T of 20 °C (see OAC 252:690-3-53). Other than for trout fisheries, if $\Delta T_{\max} > 2.8$ °C, a WLA is required.

(A) **Streams.**

$$WLA_T = T_a + \frac{1.44 (1 + Q^*)}{Q^*}, \text{ where } Q^* \leq 0.1823. \quad [E-1]$$

$$WLA_T = T_a + 17.276 - 43.428 Q^*, \text{ where } 0.1823 < Q^* < 0.3333. \quad [E-2]$$

$$WLA_T = T_a + 2.8, \text{ where } Q^* \geq 0.3333. \quad [E-3]$$

(B) **Lakes.**

$$WLA_T = T_a + \frac{56.42}{D}, \text{ where the discharge is by pipe.} \quad [E-4]$$

$$WLA_T = T_a + \frac{11.76}{\sqrt{W}}, \text{ where the discharge is by canal.} \quad [E-5]$$

(4) **LTA_T (50% probability basis).**

$$LTA_T = WLA_T \times \text{EXP} \left(0.5 \ln \left(1 + \frac{CV^2}{7} \right) \right) \quad [E-6]$$

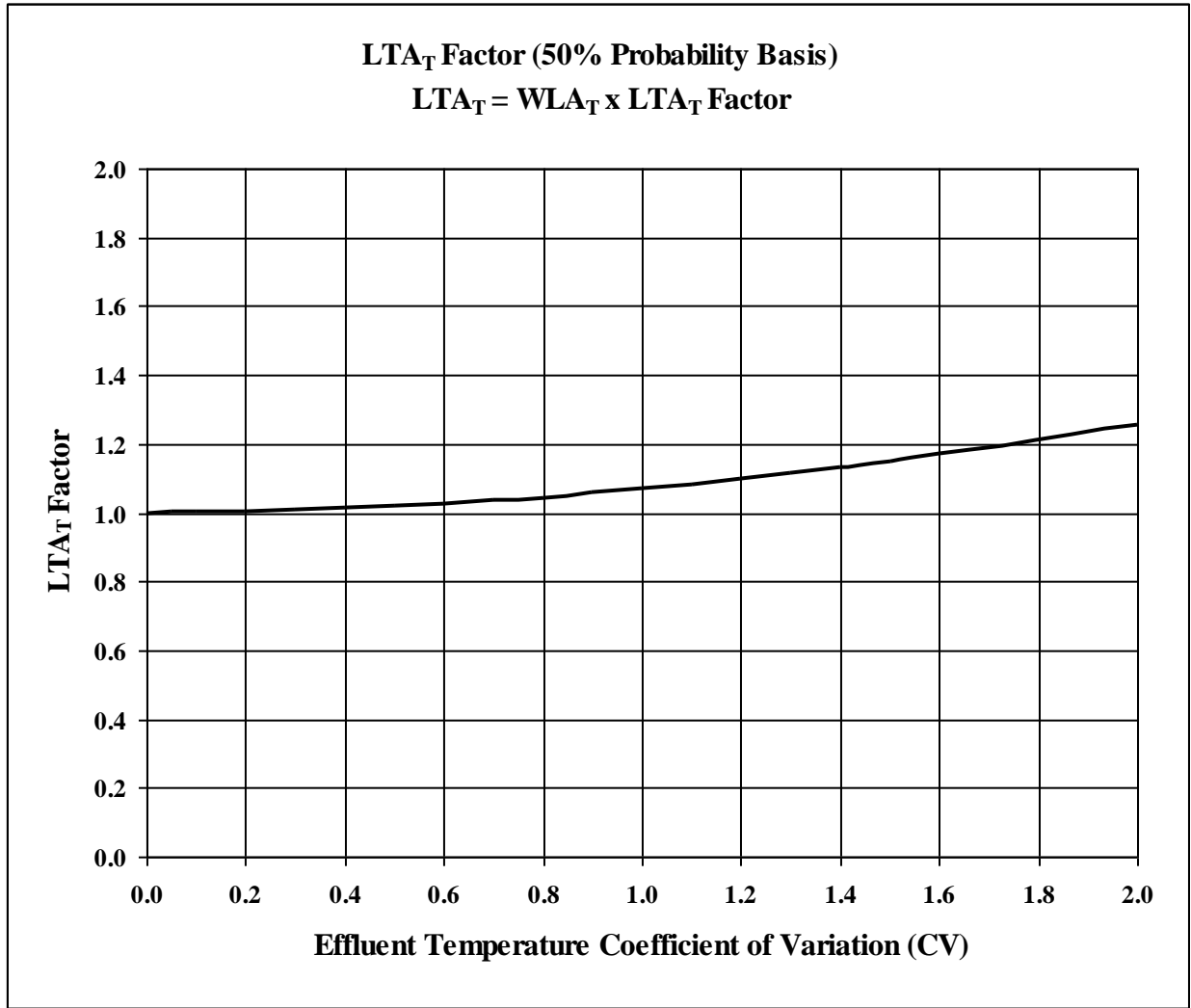


Figure E-1. Temperature LTA Factor vs. Effluent Coefficient of Variation

(5) **Permit limitations.**

(A) **MAL_T (95% probability basis).**

$$MAL_T = LTA_T \times \exp \left(1.645 \sqrt{\ln \left(1 + \frac{CV^2}{N_m} \right)} - 0.5 \ln \left(1 + \frac{CV^2}{N_m} \right) \right) \quad [E-7]$$

If calculated MAL_T exceeds 52 °C, it is capped at 52 °C for antidegradation purposes.

(B) **WAL_T (95% probability basis).**

$$WAL_T = LTA_T \times \exp \left(1.645 \sqrt{\ln \left(1 + \frac{CV^2}{N_w} \right)} - 0.5 \ln \left(1 + \frac{CV^2}{N_w} \right) \right) \quad [E-8]$$

If calculated WAL_T exceeds 52 °C, it is capped at 52 °C for antidegradation purposes.

(C) DML_T

If a daily maximum limit is required for thermal antidegradation purposes, then $DML_T = 52\text{ °C}$.

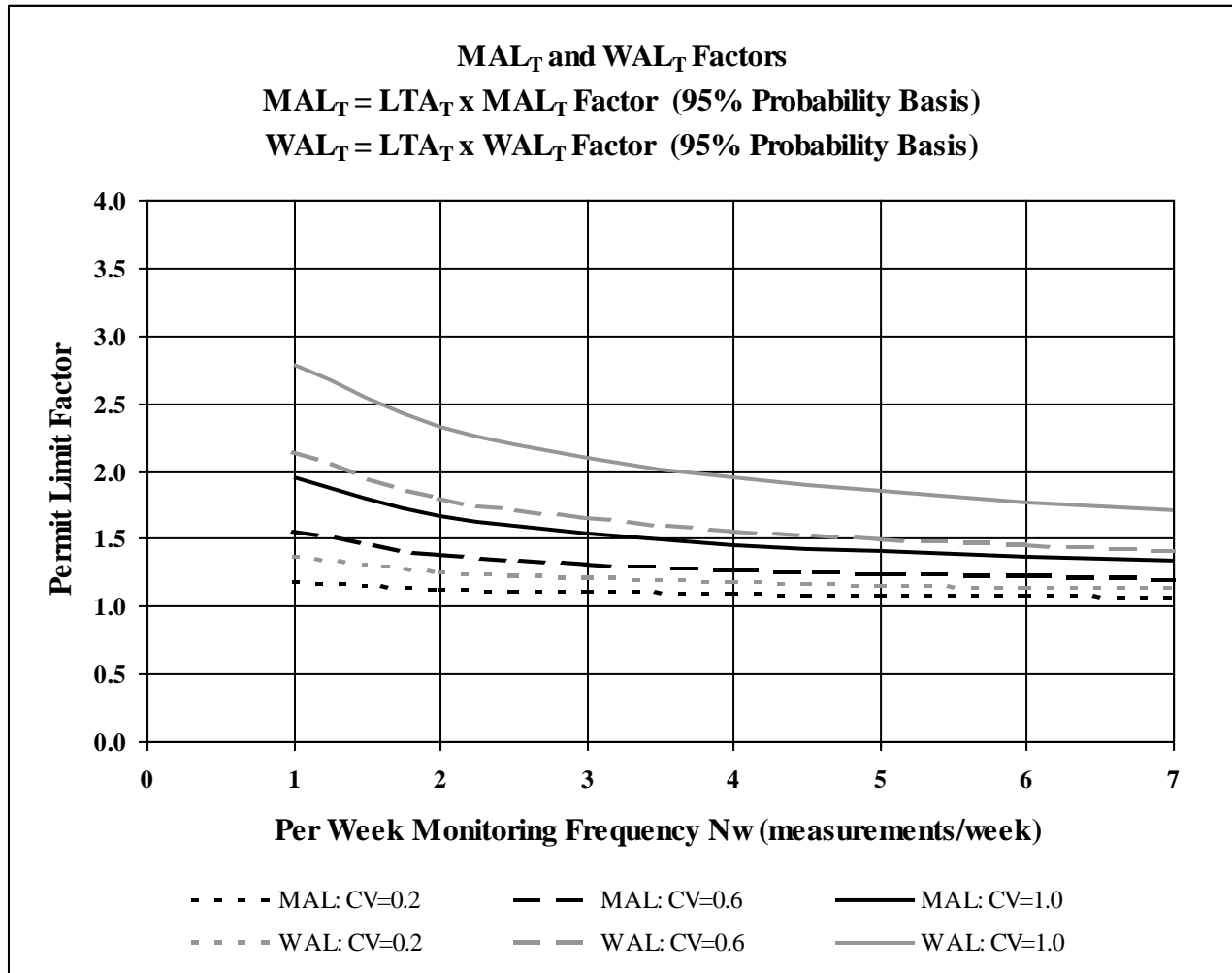


Figure E-2. Temperature MAL and WAL Permit Limit Factors vs. Per Week Monitoring Frequency N_w

APPENDIX F. EQUATIONS FOR IMPLEMENTATION OF NUMERICAL CRITERIA FOR TOXIC SUBSTANCES TO PROTECT THE FISH AND WILDLIFE PROPAGATION BENEFICIAL USE

(1) **General.** Acute and chronic toxicity numerical criteria are implemented according to OAC 252:740 and OAC 252:690-3-51 through 3-57. WLA, criterion LTA and permit limit development equations are described in this appendix.

(2) **Reasonable potential for discharges to streams.**
See OAC 252:740.

(3) **Reasonable potential for discharge to lakes.**
See OAC 252:740.

(4) **WLA_A and WLA_C for discharges to streams.**

(A) **Acute criteria WLA.**

$$WLA_A = C_B + \frac{100(C_A - C_B)}{Q_e}, \text{ where } Q_e \text{ is expressed in cfs.} \quad [F-1]$$

$$WLA_A = C_B + \frac{64.63(C_A - C_B)}{Q_e}, \text{ where } Q_e \text{ is expressed in mgd.} \quad [F-2]$$

(B) **Chronic criteria WLA.**

$$WLA_C = C_B + \frac{(1 + Q^*)(C_C - C_B)}{(1.94 Q^*)}, \text{ where } Q^* \leq 0.1823. \quad [F-3]$$

$$WLA_C = C_B + (6.17 - 15.51 Q^*)(C_C - C_B), \text{ where } 0.1823 < Q^* < 0.3333. \quad [F-4]$$

$$WLA_C = C_C, \text{ where } Q^* \geq 0.3333. \quad [F-5]$$

(5) **WLA_A and WLA_C for discharges to lakes.** The chronic WLA is calculated if a chronic criterion applies. An acute WLA is used only in the absence of a chronic criterion.

$$WLA_{C,A} = C_B + \frac{20.15(C_{C,A} - C_B)}{D}, \text{ where the discharge is by pipe.} \quad [F-6]$$

$$WLA_{C,A} = C_B + \frac{4.2(C_{C,A} - C_B)}{\sqrt{W}}, \text{ where the discharge is by canal.} \quad [F-7]$$

(6) **LTA_A and LTA_C (99% probability basis).** Whether the receiving water is a stream or lake, criterion LTAs are calculated in the same fashion. LTA_{TOX} is the more stringent of the two toxicity LTAs.

$$LTA_A = WLA_A \times \text{EXP} \left(0.5 \ln \left(1 + CV^2 \right) - 2.326 \sqrt{\ln \left(1 + CV^2 \right)} \right) \quad [\text{F-8}]$$

$$LTA_C = WLA_C \times \text{EXP} \left(0.5 \ln \left(1 + \frac{CV^2}{4} \right) - 2.326 \sqrt{\ln \left(1 + \frac{CV^2}{4} \right)} \right) \quad [\text{F-9}]$$

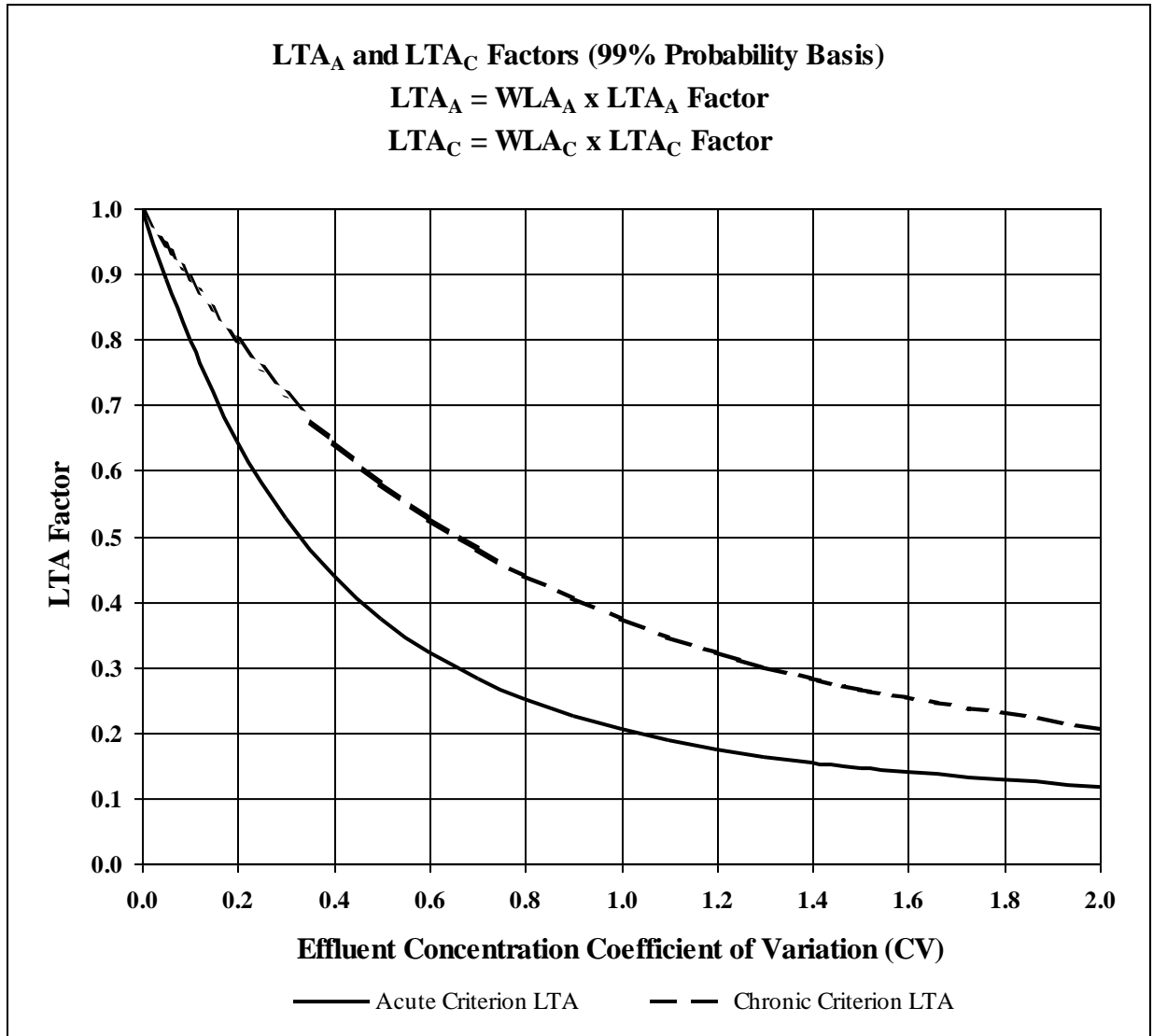


Figure F-1. Aquatic Toxicity LTA Factors vs. Effluent Coefficient of Variation

(7) **Permit limitations.**

(A) **MAL_{TOX} (95% probability basis).**

$$MAL_{TOX} = LTA_{TOX} \times \text{EXP} \left(1.645 \sqrt{\ln \left(1 + \frac{CV^2}{N_m} \right)} - 0.5 \ln \left(1 + \frac{CV^2}{N_m} \right) \right) \quad [\text{F-10}]$$

(B) DML_{TOX} (99% probability basis).

$$DML_{TOX} = LTA_{TOX} \times \exp\left(2.326 \sqrt{\ln(1 + CV^2)} - 0.5 \ln(1 + CV^2)\right) \quad [F-11]$$

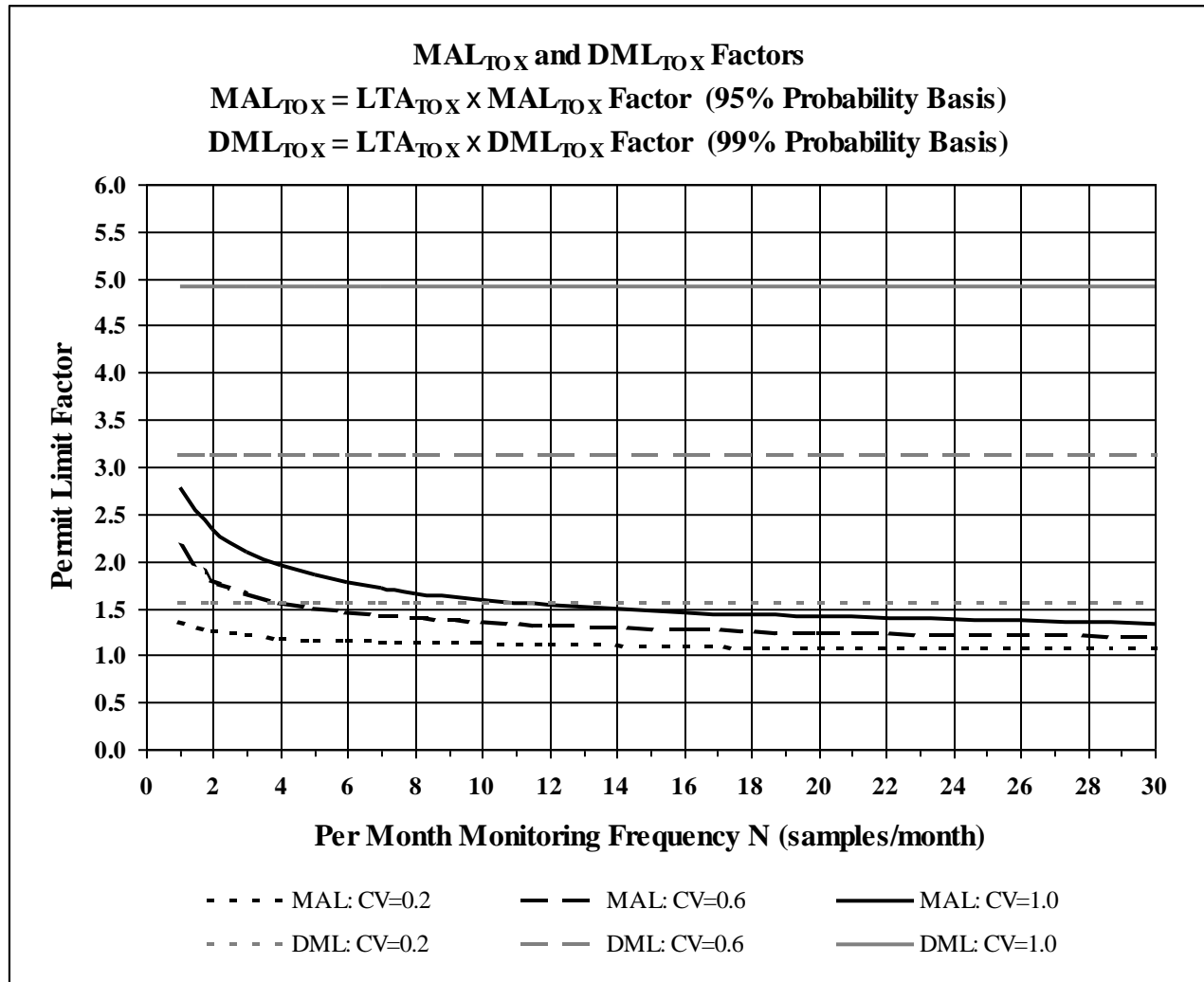


Figure F-2. Toxicity-Based MAL and DML Permit Limit Factors vs. Per Month Monitoring Frequency N_m

APPENDIX G. EQUATIONS FOR IMPLEMENTATION OF NUMERICAL HUMAN HEALTH AND RAW WATER CRITERIA TO PROTECT THE FISH CONSUMPTION AND PUBLIC AND PRIVATE WATER SUPPLY BENEFICIAL USES

(1) **General.** Human health numerical criteria (for consumption of fish flesh and consumption of fish flesh and water) and raw water column criteria are implemented according to OAC 252:740 and OAC 252:690-3-64 through 3-77. Wasteload allocation, criterion long term average and permit limit development equations are described in this appendix.

(2) **Reasonable potential.**
See OAC 252:740.

(3) **WLA_{FF}, WLA_{FFW} and WLA_{RAW}.**

$$WLA_{FF} = C_{FF} + \frac{(C_{FF} - C_B)}{Q^*} \quad [G-1]$$

$$WLA_{FFW} = C_{FFW} + \frac{(C_{FFW} - C_B)}{Q^*} \quad [G-2]$$

$$WLA_{RAW} = C_{RAW} + \frac{(C_{RAW} - C_B)}{Q^*} \quad [G-3]$$

(4) **LTA_{FF}, LTA_{FFW} and LTA_{RAW}.**

$$LTA_{FF} = WLA_{FF} \quad [G-4]$$

$$LTA_{FFW} = WLA_{FFW} \quad [G-5]$$

$$LTA_{RAW} = WLA_{RAW} \quad [G-6]$$

(5) **Permit Limitations.** MALs and DMLs are calculated for the human health/fish flesh, human health/fish flesh and water, and raw water column criteria according to the following equations, where “HH” is used as the common descriptor for all three criteria.

(A) **MAL_{HH}.**

$$MAL_{HH} = LTA_{HH} \quad [G-7]$$

(B) **DML_{HH} (99% probability basis).**

$$DML_{HH} = LTA_{HH} \times \exp \left(\frac{2.326 \sqrt{\ln(1+CV^2)} - 0.5 \ln(1+CV^2)}{1.645 \sqrt{\ln \left(1 + \frac{CV^2}{N_m} \right)} - 0.5 \ln \left(1 + \frac{CV^2}{N_m} \right)} \right) \quad [G-8]$$

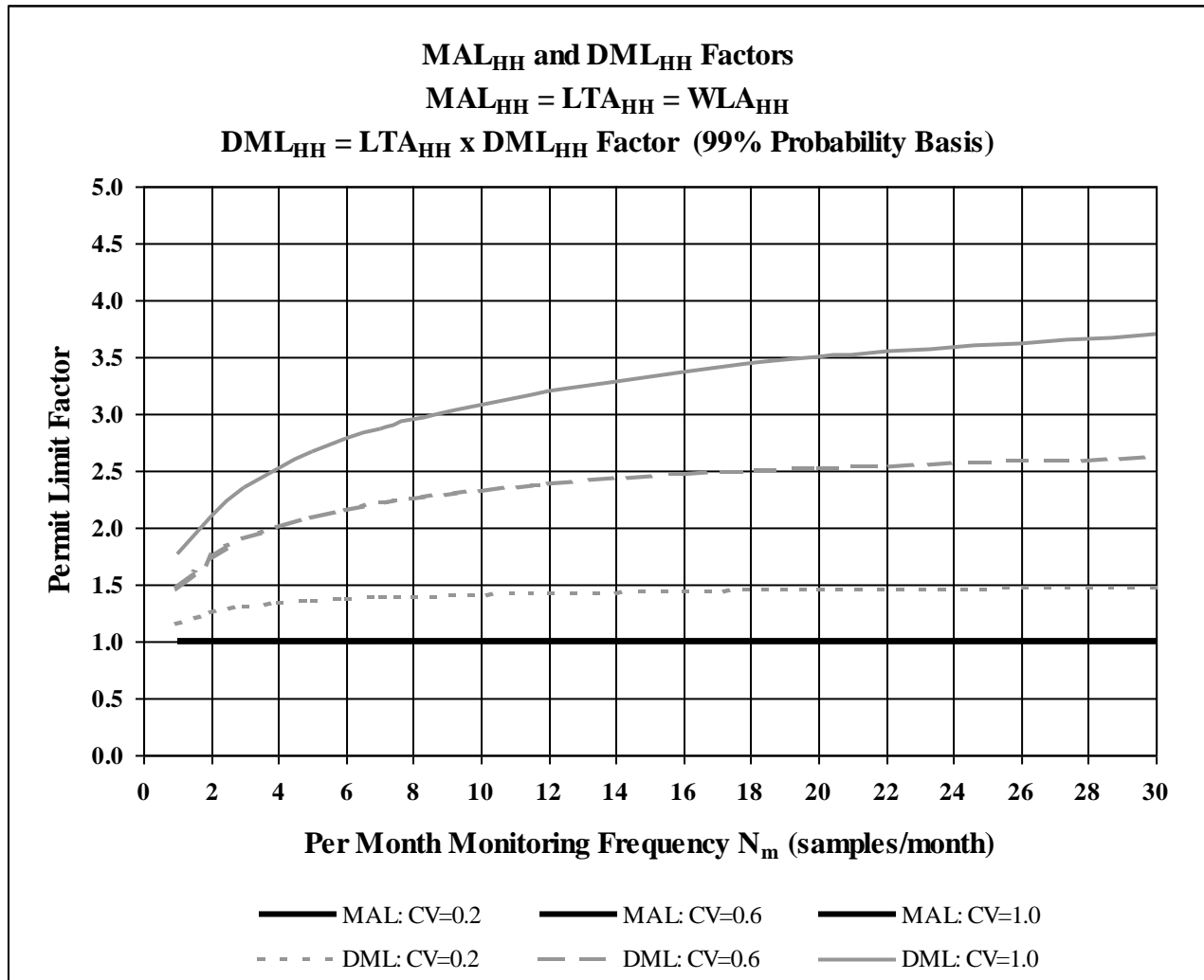


Figure G-1. Human Health-Based MAL and DML Permit Limit Factors vs. Per Month Monitoring Frequency N_m

APPENDIX H. EQUATIONS FOR IMPLEMENTATION OF NUMERICAL CRITERIA TO PROTECT THE AGRICULTURE BENEFICIAL USE

(1) **General.** Agriculture use YMS and SS numerical criteria are implemented according to OAC 252:740 and OAC 252:690-3-79 through 3-85. Wasteload allocation, criterion long term average and permit limit development equations are described in this appendix.

(2) **Reasonable potential.**
See OAC 252:740.

(3) **WLA_{YMS} and WLA_{SS}.**

$$WLA_{YMS} = C_{YMS} + \frac{(C_{YMS} - C_B)}{Q^*} \quad [H-1]$$

$$WLA_{SS} = C_{SS} + \frac{(C_{SS} - C_B)}{Q^*} \quad [H-2]$$

(4) **LTA_{YMS} and LTA_{SS} for mineral constituents**

$$LTA_{YMS} = WLA_{YMS} \quad [H-3]$$

$$LTA_{SS} = WLA_{SS} \times \text{EXP} \left(0.5 \ln \left(1 + \frac{CV^2}{4} \right) - 2.326 \sqrt{\ln \left(1 + \frac{CV^2}{4} \right)} \right) \quad [H-4]$$

(5) **LTA_{CL}, LTA_{SO4}, and LTA_{TDS}.**

$$LTA_{CL} = \text{MIN} (LTA_{YMS}, LTA_{SS}) \text{ for chlorides.} \quad [H-5]$$

$$LTA_{SO4} = \text{MIN} (LTA_{YMS}, LTA_{SS}) \text{ for sulfates.} \quad [H-6]$$

$$LTA_{TDS} = \text{MIN} (LTA_{YMS}, LTA_{SS}) \text{ for total dissolved solids.} \quad [H-7]$$

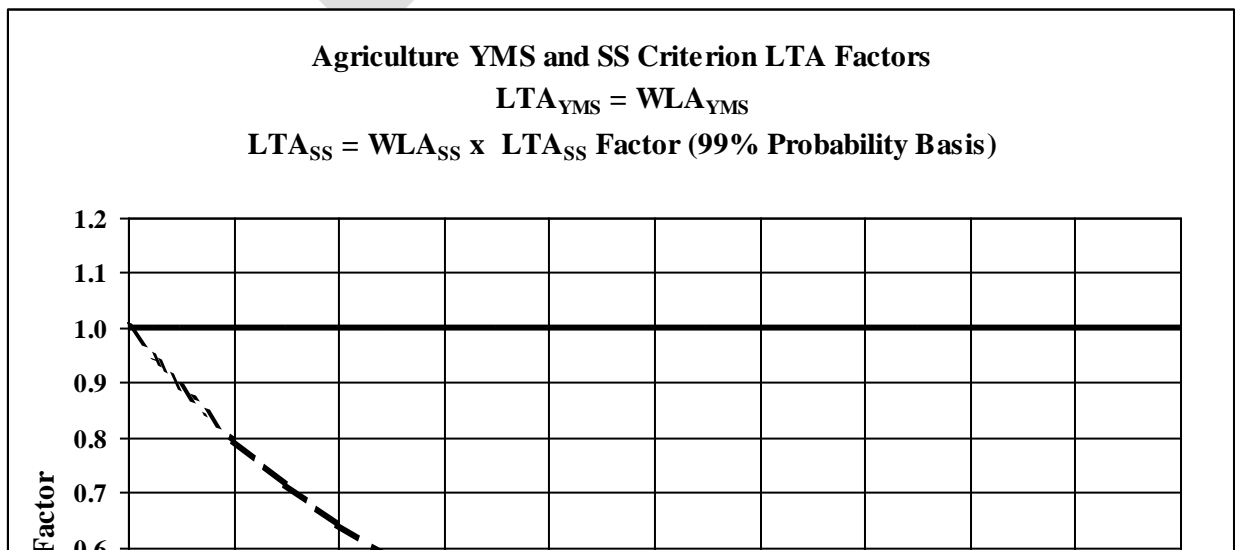


Figure H-1. Agriculture Criteria LTA Factors vs. Effluent Coefficient of Variation

(6) **Permit Limitations.** The more stringent of the YMS and SS LTAs for each mineral constituent is used to develop water quality-based permit limitations for that substance. OAC 252:730 requires that the long term average mineral constituent concentrations used to develop permit limitations be not less than 700 mg/l for TDS and not less than 250 mg/l for chlorides and sulfates. The following permit limit development equations account for this minimum LTA requirement.

(A) **MAL_{CL}, MAL_{SO4}, and MAL_{TDS} (95% probability basis).**

$$MAL_{CL} = \text{MAX} (250, LTA_{CL}) \times \text{EXP} \left(1.645 \sqrt{\ln \left(1 + \frac{CV^2}{N_m} \right)} - 0.5 \ln \left(1 + \frac{CV^2}{N_m} \right) \right) \quad [\text{H-8}]$$

$$MAL_{SO4} = \text{MAX} (250, LTA_{SO4}) \times \text{EXP} \left(1.645 \sqrt{\ln \left(1 + \frac{CV^2}{N_m} \right)} - 0.5 \ln \left(1 + \frac{CV^2}{N_m} \right) \right) \quad [\text{H-9}]$$

$$MAL_{TDS} = \text{MAX} (700, LTA_{TDS}) \times \text{EXP} \left(1.645 \sqrt{\ln \left(1 + \frac{CV^2}{N_m} \right)} - 0.5 \ln \left(1 + \frac{CV^2}{N_m} \right) \right) \quad [\text{H-10}]$$

(B) **DML_{CL}, DML_{SO4}, and DML_{TDS} (95% probability basis).**

$$DML_{CL} = \text{MAX} (250, LTA_{CL}) \times \text{EXP} \left(1.645 \sqrt{\ln (1 + CV^2)} - 0.5 \ln (1 + CV^2) \right) \quad [\text{H-11}]$$

$$DML_{SO4} = \text{MAX} (250, LTA_{SO4}) \times \text{EXP} \left(1.645 \sqrt{\ln(1 + CV^2)} - 0.5 \ln(1 + CV^2) \right) \quad [\text{H-12}]$$

$$DML_{TDS} = \text{MAX} (700, LTA_{TDS}) \times \text{EXP} \left(1.645 \sqrt{\ln(1 + CV^2)} - 0.5 \ln(1 + CV^2) \right) \quad [\text{H-13}]$$

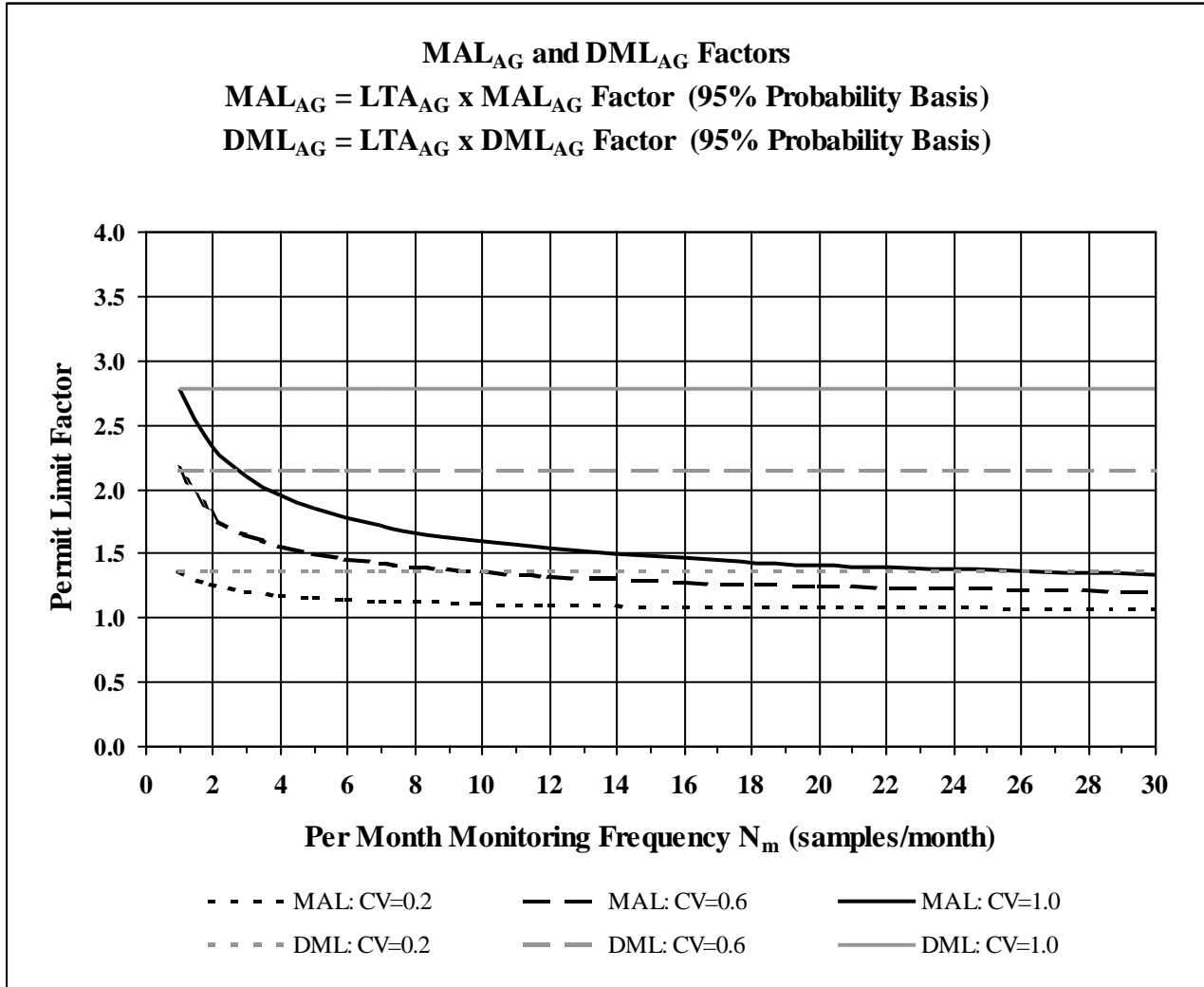


Figure H-2. Agriculture MAL and DML Permit Limit Factors vs. Per Month Monitoring Frequency N_m

APPENDIX I. PERFORMANCE-BASED EFFLUENT MONITORING FREQUENCY REDUCTIONS AND INCREASES

If a permit contains a monthly average mass loading limit, but not a monthly average concentration limit, the equivalent monthly average concentration limit may be derived from the monthly average mass loading limit and the flow basis (the high 30-day average flow during the previous permit cycle for industrial facilities and the design flow for municipal facilities).

**Table I-1. Performance Based Monitoring Frequency Reductions
(No Permit Violations During The Previous Permit Cycle)***

Baseline Monitoring Frequency (previous permit cycle)	Ratio (Percent) of Long-term Average Effluent Concentration for The Previous Permit Cycle to Monthly Average Concentration Limit ^a				
	< 25%	≥25% and <50%	≥50% and <65%	≥65% and <75%	≥75%
7/week (daily)	2/week	3/week	4/week	5/week	6/week
6/week	2/week	3/week	3/week	4/week	5/week
5/week	1/week	2/week	3/week	4/week	4/week
4/week	1/week	2/week	2/week	3/week	NR
3/week	1/week	2/week	2/week	NR	NR
2/week	2/month	1/week	1/week	NR	NR
1/week	1/month	2/month	NR	NR	NR
2/month	1/month	NR	NR	NR	NR
1/month	NR	NR	NR	NR	NR
1/2 months	NR	NR	NR	NR	NR

^a NR means “no reduction.”

* The frequency reductions stated in Table I-2 do not affect the need to conduct control tests and do not affect the number of control tests to be conducted. See OAC 252:690-3-91.

Table I-2. Monitoring Frequency Increases

Baseline Monitoring Frequency (previous permit cycle)	Increased Monitoring Frequency for parameters demonstrating a violation during the previous permit cycle ^a
7/week (daily)	NI
6/week	7/week
5/week	7/week
4/week	6/week
3/week	5/week
2/week	4/week
1/week	3/week
2/month	2/week
1/month	1/week
1/2 months (every other month)	2/month
1/3 months (once per quarter)	1/month
1/6 months (semi-annually)	1/month
1/year	1/month

^a NI means “no increase”