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Oklahoma Water Resources Board

Report 2020
North Troy Quarry
Mill Creek, OK
Vulcan Materials Company

2020 2nd Quarter Report

VMC North Troy 2020 Monitoring Report

All volumes are in acre-feet.

All Water Pumped	Total Stormwater Entering Pit note(a)	Total Groundwater Diverted	Pit Water Sent To Holding Basin	Groundwater Augmentation	Streamwater Augmentation	Defined Elements of Consumptive Use of Pit Water	Streamwater Pumped From Mill Creek	Groundwater Pumped From Wells	Total Annual Groundwater Allocation, Ac-ft
January-20	496.67	46.86	449.81	13.87	485.41	0.00	0.00	0.00	219.50
February-20	519.93	25.35	494.59	50.67	474.50	0.00	0.00	0.00	219.50
March-20	729.44	71.60	657.84	59.38	672.67	0.00	0.00	0.00	219.50
1st QTR Totals	1746.04	143.81	1602.23	123.92	1632.57	0.00	0.00	0.00	N/A
April-20	510.67	52.50	458.07	60.49	515.56	0.00	0.00	0.00	219.50
May-20	607.92	40.05	567.87	29.43	580.88	0.00	0.00	0.00	219.50
June-20	462.37	24.24	438.14	147.80	320.81	0.00	0.00	0.00	219.50
2nd QTR Totals	1880.86	116.79	1484.07	237.72	1417.24	0.00	0.00	0.00	N/A
July-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	219.50
August-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	219.50
September-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	219.50
3rd QTR Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
October-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	219.50
November-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	219.50
December-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	219.50
4th QTR Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
2020 Totals	3326.90	260.60	3066.30	361.64	3049.81	0.00	0.00	0.00	219.50
2020 Total (adj)	3326.90	260.60	3066.30	361.64	3049.81	0.00	0.00	0.00	219.50

1st Qtr notes

2nd Qtr notes

3rd Qtr notes

4th Qtr notes

Production well electric issue - unable pump / no sample | new pond transducer offline

Total Stormwater = Volume of precipitation that falls into producing mine pit and volume of precipitation that falls onto producing mine and flows over the land surface into the mine pit.

(a)

MILL CREEK 2020 AUGMENTATION and GAUGE DATA

Start Date	Start Time	Stop Date	Stop Time	Begin Reading	End Reading	Augmentation Ac - Ft pumped	Stormwater Pumped AF	Mill Creek Stream gauge Reading	Time Read	Stream height	Stream flow
January 2020	No water Pumped to Mill creek					0.00					
February 2020	No water Pumped to Mill creek					0.00					
March 2020	No water Pumped to Mill creek					0.00					
April 2020	No water Pumped to Mill creek					0.00					
May 2020	No water Pumped to Mill creek					0.00					
June 2020	No water Pumped to Mill creek					0.00					
July 2020						0.00					
August 2020						0.00					
September 2020						0.00					
October 2020						0.00					
November 2020						0.00					
December 2020						0.00					
Total						0.00					

0.00 Pumped to Mill Creek
0.00 Augmented to Mill Creek
Stormwater collected entering pit
0 Stormwater pumped to Mill Creek

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North Troy Monthly Water Data Sheet

Rows 11-57 - Precipitation Data
 Rows 59-76 - Water Data
 Rows 70-84 - Pit Sump Volumes
 Rows 91-105 - Settling Cell Evaporation
 Rows 107-144 - Monthly Shipments
 Rows 146-164 - Product Moisture Content

January Precipitation/Evaporation Data

PIT RUNOFF ASSUMPTIONS			
Hydrologic Soil Group	D		
Land Use	"gravel road"		
AMC Condition	II (ave)		
CN (pit fringe)	88		
CN (pit)	100		
S (pit fringe)			
S (pit)			
Pit - Direct Interception (>95 ft deep)	111.00		
Pit Fringe (area drains to pit)	77.00		
Drainage to Pit (total area)			

Composite RCN

Date	Precip. In.	Quarry area Runoff, in.	Fringe area Runoff, in.	Daily Evaporation, in.
1-Jan	0.00	0.00	0.17	0.17
2-Jan	0.00	0.00	0.28	0.28
3-Jan	0.00	0.00	0.1	0.1
4-Jan	0.00	0.00	0.12	0.12
5-Jan	0.00	0.00	0.1	0.1
6-Jan	0.00	0.00	0.19	0.19
7-Jan	0.00	0.00	0.16	0.16
8-Jan	0.00	0.00	0.27	0.27
9-Jan	0.00	0.00	0.12	0.12
10-Jan	2.10	3.16	0.24	0.24
11-Jan	0.04	0.04	0.16	0.16
12-Jan	0.00	0.00	0.26	0.26
13-Jan	0.00	0.00	0.14	0.14
14-Jan	0.00	0.00	0.05	0.05
15-Jan	0.00	0.00	0.04	0.04
16-Jan	0.08	0.08	0.05	0.05
17-Jan	0.48	0.48	0.04	0.04
18-Jan	0.04	0.04	0.12	0.12
19-Jan	0.00	0.00	0.13	0.13
20-Jan	0.00	0.00	0.14	0.14
21-Jan	0.00	0.00	0.15	0.15
22-Jan	0.48	0.48	0.05	0.05
23-Jan	0.28	0.28	0.08	0.08
24-Jan	0.00	0.00	0.02	0.02
25-Jan	0.00	0.00	0.28	0.28
26-Jan	0.04	0.04	0.35	0.35
27-Jan	0.80	0.80	0.1	0.1
28-Jan	0.00	0.00	0.31	0.31
29-Jan	0.00	0.00	0.16	0.16
30-Jan	0.00	0.00	0.07	0.07
31-Jan	0.00	0.00	0.17	0.17
Sum	1.11	4.14	6.71	6.71
Volume, ac-ft		49.15		
Total Vol, ac-ft		46.95		

Blue cells contain formulas

Pan Evaporation from Sulphur Mesonet

February Precipitation/Evaporation Data

PIT RUNOFF ASSUMPTIONS			
Hydrologic Soil Group	D		
Land Use	"gravel road"		
AMC Condition	II (ave)		
CN (pit fringe)	88		
CN (pit)	100		
S (pit fringe)			
S (pit)			
Pit - Direct Interception (>95 ft deep)	111.00		
Pit Fringe (area drains to pit)	77.00		
Drainage to Pit (total area)			

Date	Precip. In.	Quarry area Runoff, in.	Fringe area Runoff, in.	Daily Evaporation, in.
1-Feb	0.00	0.00	0.0	0.1
2-Feb	0.00	0.00	0.0	0.21
3-Feb	0.00	0.00	0.0	0.2
4-Feb	0.79	0.79	0.04	0.04
5-Feb	0.28	0.28	0.02	0.02
6-Feb	0.08	0.08	0.05	0.05
7-Feb	0.00	0.00	0.07	0.07
8-Feb	0.00	0.00	0.12	0.12
9-Feb	0.12	0.12	0.1	0.1
10-Feb	0.36	0.36	0.06	0.06
11-Feb	0.04	0.04	0.07	0.07
12-Feb	1.03	1.03	0.03	0.03
13-Feb	0.00	0.00	0.09	0.09
14-Feb	0.00	0.00	0.1	0.1
15-Feb	0.00	0.00	0.14	0.14
16-Feb	0.00	0.00	0.08	0.08
17-Feb	0.00	0.00	0.16	0.16
18-Feb	0.00	0.00	0.14	0.14
19-Feb	0.04	0.04	0.11	0.11
20-Feb	0.00	0.00	0.08	0.08
21-Feb	0.00	0.00	0.18	0.18
22-Feb	0.00	0.00	0.08	0.08
23-Feb	0.00	0.00	0.08	0.08
24-Feb	0.00	0.00	0.07	0.07
25-Feb	0.00	0.00	0.13	0.13
26-Feb	0.00	0.00	0.09	0.09
27-Feb	0.00	0.00	0.14	0.14
28-Feb	0.00	0.00	0.16	0.16
Sum		25.14	0.08	
Volume, ac-ft		25.14		
Total Vol, ac-ft		25.14		

Blue cells contain formulas

Pan Evaporation from Sulphur Mesonet

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March Precipitation/Evaporation Data

PIT RUNOFF ASSUMPTIONS				
Hydrologic Soil Group	D			
Land Use	"gravel road"			
AMC Condition	II (ave)			
CN (pit fringe)	88			
CN (pit)	100			
S (pit fringe)	1.00			
S (pit)	0			
Pit - Direct Interception (>95 ft deep)	111.00			
Pit fringe (area drains to pit)	77.00			
Drainage to Pit (total area)	188.00			

Date	Precip, in.	Quarry area Runoff, in.	Fringe area Runoff, in.	Daily Evaporation, in.
1-Mar	0.00	0.00	0.00	0.17
2-Mar	0.00	0.00	0.00	0.28
3-Mar	0.00	0.00	0.00	0.11
4-Mar	0.16	0.16	0.00	0.12
5-Mar	0.00	0.00	0.00	0.11
6-Mar	0.00	0.00	0.00	0.19
7-Mar	0.00	0.00	0.00	0.16
8-Mar	0.00	0.00	0.00	0.27
9-Mar	0.28	0.28	0.00	0.12
10-Mar	0.00	0.00	0.00	0.24
11-Mar	0.00	0.00	0.00	0.18
12-Mar	0.00	0.00	0.00	0.26
13-Mar	1.43	1.43	0.00	0.14
14-Mar	0.64	0.64	0.00	0.05
15-Mar	0.00	0.00	0.00	0.04
16-Mar	0.20	0.20	0.00	0.05
17-Mar	0.16	0.16	0.00	0.04
18-Mar	1.38	1.38	0.00	0.12
19-Mar	1.47	1.47	0.00	0.13
20-Mar	0.00	0.00	0.00	0.14
21-Mar	0.00	0.00	0.00	0.15
22-Mar	0.24	0.24	0.00	0.05
23-Mar	0.04	0.04	0.00	0.08
24-Mar	0.00	0.00	0.00	0.02
25-Mar	0.00	0.00	0.00	0.28
26-Mar	0.00	0.00	0.00	0.35
27-Mar	0.00	0.00	0.00	0.11
28-Mar	0.00	0.00	0.00	0.31
29-Mar	0.00	0.00	0.00	0.18
30-Mar	0.64	0.64	0.00	0.07
31-Mar	0.00	0.00	0.00	0.17
sum	6.64	6.64	0.00	4.15
Volume, ac-ft	6.142	6.142	0.00	18.18
Total Vol, ac-ft	71.65	71.65	0.00	

Pan Evaporation from Sulphur Masonet

April Precipitation/Evaporation Data

PIT RUNOFF ASSUMPTIONS				
Hydrologic Soil Group	D			
Land Use	"gravel road"			
AMC Condition	II (ave)			
CN (pit fringe)	88			
CN (pit)	100			
S (pit fringe)	1.00			
S (pit)	0			
Pit - Direct Interception (>95 ft deep)	111.00			
Pit fringe (area drains to pit)	77.00			
Drainage to Pit (total area)	188.00			

Date	Precip, in.	Quarry area Runoff, in.	Fringe area Runoff, in.	Daily Evaporation, in.
1-Apr	0.00	0.00	0.00	0.2
2-Apr	0.00	0.00	0.00	0.14
3-Apr	0.12	0.12	0.00	0.12
4-Apr	0.00	0.00	0.00	0.05
5-Apr	0.00	0.00	0.00	0.1
6-Apr	0.00	0.00	0.00	0.13
7-Apr	0.00	0.00	0.00	0.29
8-Apr	0.00	0.00	0.00	0.3
9-Apr	0.00	0.00	0.00	0.35
10-Apr	0.00	0.00	0.00	0.28
11-Apr	0.43	0.43	0.00	0.1
12-Apr	1.22	1.22	0.00	0.14
13-Apr	0.00	0.00	0.00	0.19
14-Apr	0.00	0.00	0.00	0.1
15-Apr	0.00	0.00	0.00	0.17
16-Apr	0.00	0.00	0.00	0.32
17-Apr	0.00	0.00	0.00	0.13
18-Apr	0.00	0.00	0.00	0.18
19-Apr	0.00	0.00	0.00	0.07
20-Apr	0.00	0.00	0.00	0.16
21-Apr	0.00	0.00	0.00	0.28
22-Apr	2.68	2.68	0.00	0.1
23-Apr	0.00	0.00	0.00	0.26
24-Apr	0.00	0.00	0.00	0.28
25-Apr	0.00	0.00	0.00	0.28
26-Apr	0.00	0.00	0.00	0.24
27-Apr	0.00	0.00	0.00	0.37
28-Apr	0.16	0.16	0.00	0.25
29-Apr	0.00	0.00	0.00	0.3
30-Apr	0.00	0.00	0.00	0.24
sum	4.81	4.81	0.00	6.12
Volume, ac-ft	4.45	4.45	0.00	13.4
Total Vol, ac-ft	52.56	52.56	0.00	

Pan Evaporation from Sulphur Masonet

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June Precipitation/Evaporation Data

PIT RUNOFF ASSUMPTIONS									
Hydrologic Soil Group			D						
Land Use			gravel road						
AMC Condition			II (ave)						
CN (pit fringe)			88						
CN (pit)			100						
S (pit fringe)									
S (pit)									
Pit - Direct interception (>85 ft deep)			111.00						
Pit fringe (area drains to pit)			77.00						
Drainage to Pit (total area)			188.00						
Date	Precip. in.	Runoff, in.	Runoff, in.	Evaporation, in.	Daily				
1-Jun	0.00	0.00	0.00	0.00	0.27	Runoff formula			
2-Jun	0.00	0.00	0.00	0.00	0.27	$P_e = (P-0.2S)^2/(P+0.8S)$			
3-Jun	0.00	0.00	0.00	0.00	0.31	$S = (1000/CN)-10$			
4-Jun	0.00	0.00	0.00	0.00	0.35				
5-Jun	0.00	0.00	0.00	0.00	0.32	Blue cells contain form			
6-Jun	0.00	0.00	0.00	0.00	0.31				
7-Jun	0.00	0.00	0.00	0.00	0.34	Rainfall Data for 6/1-6/9 taken from			
8-Jun	0.00	0.00	0.00	0.00	0.28	Mill Creek stream gage due to			
9-Jun	0.00	0.00	0.00	0.00	0.43	weather station malfunction.			
10-Jun	0.00	0.00	0.00	0.00	0.42				
11-Jun	0.00	0.00	0.00	0.00	0.28				
12-Jun	0.00	0.00	0.00	0.00	0.28				
13-Jun	0.00	0.00	0.00	0.00	0.32				
14-Jun	0.00	0.00	0.00	0.00	0.34				
15-Jun	0.00	0.00	0.00	0.00	0.32				
16-Jun	0.00	0.00	0.00	0.00	0.34				
17-Jun	0.00	0.00	0.00	0.00	0.41				
18-Jun	0.00	0.00	0.00	0.00	0.47				
19-Jun	1.07	1.07	1.07	0.00	0.31				
20-Jun	0.08	0.08	0.08	0.00	0.29				
21-Jun	0.08	0.08	0.08	0.00	0.19				
22-Jun	0.52	0.52	0.52	0.00	0.28				
23-Jun	0.87	0.87	0.87	0.00	0.16				
24-Jun	0.00	0.00	0.00	0.00	0.28				
25-Jun	0.00	0.00	0.00	0.00	0.29				
26-Jun	0.00	0.00	0.00	0.00	0.28				
27-Jun	0.00	0.00	0.00	0.00	0.33				
28-Jun	0.00	0.00	0.00	0.00	0.25				
29-Jun	0.00	0.00	0.00	0.00	0.35				
30-Jun	0.00	0.00	0.00	0.00	0.32				
sum	2.63	2.63	2.63	0.00	9.39				
Volume, ac-ft					24.34	Pan Evaporation from Sulphur Mesonet			
Total Vol, ac-ft					24.34				

May Precipitation/Evaporation Data

PIT RUNOFF ASSUMPTIONS									
Hydrologic Soil Group			D						
Land Use			gravel road						
AMC Condition			II (ave)						
CN (pit fringe)			88						
CN (pit)			100						
S (pit fringe)									
S (pit)									
Pit - Direct interception (>85 ft deep)			111.00						
Pit fringe (area drains to pit)			77.00						
Drainage to Pit (total area)			188.00						
Date	Precip. in.	Runoff, in.	Runoff, in.	Evaporation, in.	Daily				
1-May	0.00	0.00	0.00	0.00	0.41	Runoff formula			
2-May	0.00	0.00	0.00	0.00	0.34	$P_e = (P-0.2S)^2/(P+0.8S)$			
3-May	0.00	0.00	0.00	0.00	0.28	$S = (1000/CN)-10$			
4-May	0.20	0.20	0.20	0.00	0.33				
5-May	0.00	0.00	0.00	0.00	0.28	Blue cells contain formulas			
6-May	0.00	0.00	0.00	0.00	0.16				
7-May	0.00	0.00	0.00	0.00	0.31				
8-May	0.83	0.83	0.83	0.00	0.24				
9-May	0.00	0.00	0.00	0.00	0.22				
10-May	0.00	0.00	0.00	0.00	0.2				
11-May	0.00	0.00	0.00	0.00	0.27				
12-May	1.26	1.26	1.26	0.00	0.06				
13-May	0.00	0.00	0.00	0.00	0.14				
14-May	0.24	0.24	0.24	0.00	0.27				
15-May	0.36	0.36	0.36	0.00	0.14				
16-May	0.00	0.00	0.00	0.00	0.05				
17-May	0.04	0.04	0.04	0.00	0.27				
18-May	0.00	0.00	0.00	0.00	0.24				
19-May	0.00	0.00	0.00	0.00	0.29				
20-May	0.00	0.00	0.00	0.00	0.25				
21-May	0.00	0.00	0.00	0.00	0.06				
22-May	0.16	0.16	0.16	0.00	0.23				
23-May	0.00	0.00	0.00	0.00	0.33				
24-May	0.24	0.24	0.24	0.00	0.22				
25-May	0.80	0.80	0.80	0.00	0.05				
26-May	0.04	0.04	0.04	0.00	0.1				
27-May	0.00	0.00	0.00	0.00	0.21				
28-May	0.16	0.16	0.16	0.00	0.15				
29-May	0.00	0.00	0.00	0.00	0.25				
30-May	0.00	0.00	0.00	0.00	0.29				
31-May	0.00	0.00	0.00	0.00	0.28				
sum	4.33	4.33	4.33	0.00	6.96				
Volume, ac-ft					46.85	Pan Evaporation from Sulphur Mesonet			
Total Vol, ac-ft					46.85				

Monthly Water Data, ac-ft

	Water Diverted From Pit	Storm Water Entering Pit	Net Sump Volume Change	Groundwater Sent To Holding Basin	Groundwater Sent To Infiltration Areas	Groundwater Used For Stream Augmentation	Evaporation	Moisture Content of Product Shipped	Water Truck Usage	Misc Pit Water Use On Site	Misc Pit Water Use Off Site	Production Well Permit 2002-402	North Well Permit 20060601A
January-20	498.67	48.86	3.05	13.07	482.80	0.00	0.69	1.85	0.28	0.00	0.00	0.00	0.00
February-20	518.93	25.35	0.00	50.67	469.26	0.00	0.46	1.26	1.01	0.00	0.00	0.00	0.00
March-20	728.44	71.60	0.00	59.38	670.06	0.00	0.69	2.76	0.92	0.00	0.00	0.00	0.00
April-20	510.57	52.50	0.00	60.49	510.57	0.00	1.37	4.14	0.64	0.00	0.00	0.00	0.00
May-20	607.92	40.05	0.00	29.43	578.49	0.00	1.56	4.07	0.59	0.00	0.00	0.00	0.00
June-20	452.37	24.24	0.00	147.80	314.57	0.00	2.10	3.17	2.32	0.00	0.00	0.00	0.00
July-20		0.00				0.00	0.00	0.00		0.00	0.00	0.00	0.00
August-20		0.00				0.00	0.00	0.00		0.00	0.00	0.00	0.00
September-20		0.00				0.00	0.00	0.00		0.00	0.00	0.00	0.00
October-20		0.00				0.00	0.00	0.00		0.00	0.00	0.00	0.00
November-20		0.00				0.00	0.00	0.00		0.00	0.00	0.00	0.00
December-20		0.00				0.00	0.00	0.00		0.00	0.00	0.00	0.00

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Pit Sump Volumes

	West Sump					905 Sump					New Freshwater Pond					Pit area		
	Month End Depth-to- Water, Ft	Width, Ft	Length, Ft	Sump Volume Change, Ac-ft	Evaporation, ac- ft	Month End Depth-to-Water, Ft	Width, Ft	Length, Ft	Sump Volume Change, Ac-ft	Evaporation, ac-ft	Month End Depth-to- Water, Ft	Width, Ft	Length, Ft	Pond Volume Change, Ac-ft	Evaporation, ac-ft	Total Evaporation, ac-ft	Acres	Evaporation, ac-ft
January-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00
February-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00
March-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00
April-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00
May-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00
June-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00
July-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00
August-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00
September-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00
October-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00
November-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00
December-20	7	125	325	0.00	0.00	4	50	50	50	0.00	4		750	0.00	0.00	0.00	1.7	0.00

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January Shipments		February Shipments		March Shipments	
Tons Shipped	Ac-ft of water shipped	Tons Shipped	Ac-ft of water shipped	Tons Shipped	Ac-ft of water shipped
Base Products	3,648	Base Products	2,601	Base Products	1,372
Coarse Aggregates	129,961	Coarse Aggregates	98,647	Coarse Aggregates	225,401
Fine Aggregates	6,315	Fine Aggregates	611	Fine Aggregates	431
	139,924		102,859		237,204
	1,852		1,281		2,756

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April Shipments			May Shipments			June Shipments		
Tons Shipped	Ac-ft of water shipped		Tons Shipped	Ac-ft of water shipped		Tons Shipped	Ac-ft of water shipped	
Base Products	3 336		Base Products	3 236		Base Products	3 036	
Coarse		0 082	Coarse		0 079	Coarse		0 074
Aggregates	313 283	3 763	Aggregates	264 171	3 536	Aggregates	234 559	2 814
Fine			Fine			Fine		
Aggregates	9 072	0 388	Aggregates	14 354	0 451	Aggregates	8 556	0 272
		5 335		11 751	4 373			3 155