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MMM North Troy 2013 Monitoring Report

All volumes are in acre-feet.

Q2

Oklahoma Water Resources Board

	Total Groundwater Entering Pit	Total Stormwater Entering Pit	Total Pit Stormwater Diverted	Total Pit Water Diverted	Pit Water Sent To Holding Basin	Groundwater Augmentation	Streamwater Augmentation	Consumptive Use of Pit Water	Streamwater Pumped From Mill Creek	Groundwater Pumped From Wells	Total Annual Groundwater Allocation, Ac-R
January-13	127.55	4.90	4.90	130.26	47.05	48.41	42.20	4.39	0.00	0.00	594.72
February-13	111.70	16.71	16.71	110.55	32.13	48.51	51.62	4.66	0.00	0.00	594.72
March-13	136.29	7.32	7.32	143.14	0.00	152.64	0.00	7.01	0.00	0.12	594.72
1st QTR Totals	375.54	28.93	28.93	383.96	79.18	249.55	93.82	16.06	0.00	0.12	N/A
April-13	134.72	9.39	9.39	128.77	0.00	138.16	0.00	7.15	0.00	0.00	594.72
May-13	130.37	58.76	58.76	129.41	46.80	146.85	0.00	6.85	0.00	0.00	594.72
June-13	150.01	22.82	22.82	149.80	0.00	197.27	0.00	10.30	0.00	0.17	594.72
2nd QTR Totals	415.10	90.97	90.97	407.98	46.80	482.28	0.00	24.11	0.00	0.17	N/A
July-13											594.72
August-13											594.72
September-13											594.72
3rd QTR Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
October-13											594.72
November-13											594.72
December-13											594.72
4th QTR Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
2013 Totals	790.64	119.91	119.91	791.94	125.98	731.83	93.82	40.16	0.00	0.28	594.72

1st Qtr Notes

Mill Creek 2013 Augmentation and Gage Data

Start Date	Start Time	Stop Date	Stop Time	Begin Reading	End Reading	Ac-ft Pumped	Mill Creek Stream Gage Reading	Time Read	Stream Height	Stream Flow
1/1/2013	12:30pm	1/2/2013	4:30pm	2,142,370,000	2,146,620,000	13.04	7331200	1:30 PM CST	5.82 P	1.4 P
1/3/2013	7:30am	1/3/2013	3:00pm	2,146,620,000	2,148,020,000	4.30	7331200	7:30 AM CST	5.96 P	3.5 P
1/5/2013	8:05am	1/5/2013	4:37pm	2,148,020,000	2,149,390,000	4.20	7331200	8:00 AM CST	5.83 P	1.6 P
1/7/2013	6:10am	1/8/2013	2:00pm	2,149,390,000	2,154,160,000	14.64	7331200	6:00 AM CST	5.81 P	1.4 P
1/28/2013	11:45am	1/28/2013	3:40pm	2,182,970,000	2,183,370,000	1.23	7331200	1/27/13 12:30 AM CST	5.75 P	0.66 P
<i>Note: Data was not recorded for 1/28/13. Data shown is for 1/27/13 and 1/29/13</i>										
1/29/2013	7:30am	1/29/2013	2:15pm	2,183,370,000	2,184,070,000	2.15	7331200	1/29/13 7:00 PM CST	5.87 P	2 P
1/30/2013	7:05am	1/30/2013	3:35pm	2,184,070,000	2,184,930,000	2.64	7331200	7:00 PM CST	5.87 P	2 P
<i>Note: Data was not recorded for 1/30/13 @ 7:00am. Data shown is for 1:30am and 11:00pm</i>										
2/3/2013	Start time not logged, app 7:30am	2/5/2013	3:40pm	2,187,890,000	2,193,610,000	17.55	7331200	8:30 AM CST	5.73 P	0.73 P
2/6/2013	8:40am	2/6/2013	3:40pm	2,193,610,000	2,194,560,000	2.92	7331200	8:30 AM CST	5.74 P	0.79 P
2/7/2013	8:00am	2/7/2013	3:40pm	2,194,560,000	2,195,690,000	3.47	7331200	8:30 AM CST	5.73 P	0.73 P
2/8/2013	6:20am	2/8/2013	3:40pm	2,195,690,000	2,197,230,000	4.73	7331200	8:00 AM CST	5.88 P	2.2 P
2/9/2013	10:37am	2/9/2013	3:26pm	2,197,230,000	2,198,050,000	2.52	7331200	8:00 AM CST	5.93 P	2.9 P
2/11/2013	7:30am	2/12/2013	4:37pm	2,198,050,000	2,203,180,000	15.74	7331200	6:00 AM CST	5.89 P	2.3 P
2/13/2013	6:45am	2/13/2013	4:40pm	2,203,180,000	2,204,710,000	4.70	7331200	10:30 AM CST	5.85 P	1.8 P
4/1/2013	NO AUGMENTATION THIS MONTH									

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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)	1.363636									
S (pit)	0									
Pit - Direct Interception (>95 ft deep)	53.91									
Pit fringe (area drains to pit)	122.04									
Drainage to Pit (total area)	175.95									
	Quarry area	Fringe area	Daily							
Date	Precip, in.	Runoff, in.	Runoff, in.	Evaporation, in.						
1-Apr	0.00	0.00	0.00	0.003	Runoff formula					
2-Apr	1.05	1.05	0.00	0.036	Pe = (P-0.2S)^2/(P+0.2)					
3-Apr	0.34	0.34	0.00	0.034	S = (10000/CN)-10					
4-Apr	0.10	0.10	0.00	0.067						
5-Apr	0.00	0.00	0.00	0.159	Blue cells c					
6-Apr	0.00	0.00	0.00	0.213						
7-Apr	0.00	0.00	0.00	0.071						
8-Apr	0.00	0.00	0.00	0.147						
9-Apr	0.00	0.00	0.00	0.147						
10-Apr	0.41	0.41	0.00	0.056						
11-Apr	0.00	0.00	0.00	0.154						
12-Apr	0.00	0.00	0.00	0.176						
13-Apr	0.00	0.00	0.00	0.198						
14-Apr	0.00	0.00	0.00	0.247						
15-Apr	0.00	0.00	0.00	0.207						
16-Apr	0.00	0.00	0.00	0.118						
17-Apr	0.02	0.02	0.00	0.145						
18-Apr	0.14	0.14	0.00	0.134						
19-Apr	0.00	0.00	0.00	0.19						
20-Apr	0.00	0.00	0.00	0.267						
21-Apr	0.00	0.00	0.00	0.217						
22-Apr	0.00	0.00	0.00	0.233						
23-Apr	0.01	0.01	0.00	0.048						
24-Apr	0.00	0.00	0.00	0.181						
25-Apr	0.00	0.00	0.00	0.203						
26-Apr	0.01	0.01	0.00	0.093						
27-Apr	0.00	0.00	0.00	0.128						
28-Apr	0.01	0.01	0.00	0.207						
29-Apr	0.00	0.00	0.00	0.266						
30-Apr	0.00	0.00	0.00	0.261						
	2.09	0.00	0.00	4.61					4.606	
Volume, ac-ft	9.39	0.00								
Total Vol, ac-ft	9.39									

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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)	1.363636
S (pit)	0
Pit - Direct Interception (>95 ft deep)	53.91
Pit fringe (area drains to pit)	122.04
Drainage to Pit (total area)	175.95

Date	Precip. in.	Runoff, in.	Runoff, in.	Evaporation, in.	Runoff, in.
1-May	0.00	0.00	0.00	0.00	0.181
2-May	0.10	0.10	0.00	0.00	0.066
3-May	0.00	0.00	0.00	0.00	0.23
4-May	0.00	0.00	0.00	0.00	0.184
5-May	0.00	0.00	0.00	0.00	0.125
6-May	0.00	0.00	0.00	0.00	0.19
7-May	0.00	0.00	0.00	0.00	0.227
8-May	0.04	0.04	0.00	0.00	0.276
9-May	0.01	0.01	0.00	0.00	0.083
10-May	0.01	0.01	0.00	0.00	0.182
11-May	0.00	0.00	0.00	0.00	0.229
12-May	0.00	0.00	0.00	0.00	0.234
13-May	0.00	0.00	0.00	0.00	0.296
14-May	0.00	0.00	0.00	0.00	0.308
15-May	0.66	0.66	0.00	0.00	0.087
16-May	0.18	0.18	0.00	0.00	0.056
17-May	0.00	0.00	0.00	0.00	0.102
18-May	0.00	0.00	0.00	0.00	0.24
19-May	0.00	0.00	0.00	0.00	0.257
20-May	0.63	0.63	0.00	0.00	0.178
21-May	3.41	3.41	2.19	0.039	0.039
22-May	0.01	0.01	0.00	0.00	0.217
23-May	0.52	0.52	0.00	0.00	0.176
24-May	0.00	0.00	0.00	0.00	0.173
25-May	0.13	0.13	0.00	0.00	0.136
26-May	0.00	0.00	0.00	0.00	0.165
27-May	0.00	0.00	0.00	0.00	0.15
28-May	0.00	0.00	0.00	0.00	0.192
29-May	1.12	1.12	0.00	0.00	0.118
30-May	1.31	1.31	0.00	0.00	0.127
31-May	0.00	0.00	0.00	0.00	0.242
	8.13	8.13	2.19	5.47	5.466
Volume, ac-ft		36.52		22.24	
Total Vol, ac-ft		58.76			

ulas Blue cells contain form

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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)	1.363636
S (pit)	0
Pit - Direct interception (>95 ft deep)	53.91
Pit fringe (area drains to pit)	122.04
Drainage to Pit (total area)	175.95

Date	Precip, in.	Runoff, in.	Quarry area	Fringe area	Runoff, in.	Evaporation, in.	Daily
1-Jun	0.77	0.77	0.00	0.00	0.00	0.00	0.3
2-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
3-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
4-Jun	0.73	0.73	0.00	0.00	0.00	0.00	0.3
5-Jun	0.69	0.69	0.00	0.00	0.00	0.00	0.3
6-Jun	1.27	1.27	0.00	0.00	0.00	0.00	0.3
7-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
8-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
9-Jun	0.29	0.29	0.00	0.00	0.00	0.00	0.3
10-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
11-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
12-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
13-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
14-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
15-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
16-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
17-Jun	1.33	1.33	0.00	0.00	0.00	0.00	0.3
18-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
19-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
20-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
21-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
22-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
23-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
24-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
25-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
26-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
27-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
28-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
29-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
30-Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.3
Volume, ac-ft	5.08	0.00	0.00	0.00	0.00	0.00	9
Total Vol, ac-ft	22.82	0.00	0.00	0.00	0.00	0.00	

Runoff formula
 $Pe = (P - 0.2S)^2 / (P + 0.8S)$
 $S = (1000 / CN) - 10$

Blue cells contain form

Rainfall Data for 6/21-6/30 taken from Mill Creek stream gage due to weather station malfunction. Evaporation data is based on OWRB monthly average for June.

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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	46,967	Base Products	37,855	Base Products	51,485
Coarse Aggregates	128,541	Coarse Aggregates	44,513	Coarse Aggregates	99,103
Fine Aggregates	29,495	Fine Aggregates	25,018	Fine Aggregates	27,201
	205,003		107,386		177,789
	1.150		0.927		1.261
	1.545		0.535		1.191
	0.937		0.795		0.864
	3.632		2.257		3.316

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