



Robin L. Simmons
Regional Land Manager

January 28, 2019

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Matt Cogburn
Oklahoma Water Resources Board
3800 N. Classen
Oklahoma City, OK 73118

Oklahoma Water Resources Board

Re: Martin Marietta/Material Producers Davis Quarry Q4 and Annual 2018 Monitoring Report

Dear Mr. Cogburn:

Attached please find the Q4 and Annual 2018 monitoring report and associated data and calculations for Martin Marietta/Material Producers' Davis Quarry. We continue to have problems with the weather station and are in the process of replacing it. Mesonet weather rainfall and evapotranspiration data from Sulphur were used for the missing data.

In July we discovered that our freshwater pond had significantly silted in. This means that we are storing less water in our circuit than we thought and our recharge to the aquifer and to surface water has been higher than calculated over the past couple years. As a result of ongoing efforts to repair and clear our freshwater pond, we are temporarily not able to monitor water depths in the pond. Since the water collection pond in the pit is now being used to store the water while we resolve the freshwater pond issue, we have temporarily lost access to the data logger in the pit. We have been able to use drone data to get relative elevations for the water in the pit.

As is typical at the Davis Quarry, in Q4 we see more precipitation and runoff entering the pit than the total water we use from the pit. Also typically, we do not see a rise in water levels in the pit that correspond to the additional precipitation and runoff that we know is entering the pit and not being used. Thus we still see a net decrease of water within the pit indicating that we continue to augment groundwater through the pit.

Sincerely,

A handwritten signature in blue ink that reads 'Robin L. Simmons'.

Robin L. Simmons
Regional Land Manager

North Texas/Oklahoma District

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MMM Davis Quarry 2018 Monitoring Report

All volumes are in acre-feet.

	Total Groundwater Entering Pit	Total Stormwater Entering Pit	Total Stormwater Diverted from Pit	Total Water Diverted	Water Sent To Holding Basin	Groundwater Augmentation	Streamwater Augmentation	Consumptive Use of Stormwater	Consumptive Use of Groundwater	Groundwater Pumped From Well
January-18	-6.36	0.75	0.75	-5.61	N/A	-6.36	0.00	2.12	0.00	0.00
February-18	-37.63	52.39	52.39	14.75	N/A	-37.63	0.00	2.30	0.00	0.00
March-18	-21.44	26.01	26.01	4.58	N/A	-21.44	0.00	3.68	0.00	0.00
1st QTR Totals	-65.43	79.15	79.15	13.72	0.00	-65.43	0.00	8.10	0.00	0.00
April-18	-18.17	20.52	20.52	2.34	N/A	-18.17	0.00	4.35	0.00	0.00
May-18	-87.36	92.19	92.19	4.83	N/A	-87.36	0.00	3.93	0.00	0.00
June-18	-12.67	17.53	17.53	4.85	N/A	-12.67	0.00	3.25	0.00	0.00
2nd QTR Totals	-118.21	130.24	130.24	12.03	0.00	-118.21	0.00	11.53	0.00	0.00
July-18	-17.81	18.20	18.20	0.39	N/A	-17.81	0.00	3.38	0.00	0.00
August-18	-34.16	43.56	43.56	9.39	N/A	-34.16	0.00	3.95	0.00	0.00
September-18	-106.27	119.16	119.16	12.89	N/A	-106.27	0.00	4.30	0.00	0.00
3rd QTR Totals	-158.25	180.92	180.92	22.67	0.00	-158.25	0.00	11.63	0.00	0.00
October-18	-30.06	33.08	33.08	3.02	N/A	-30.06	0.00	4.18	0.00	0.00
November-18	10.51	1.18	1.18	11.68	N/A	10.51	0.00	3.03	0.00	0.00
December-18	4.48	20.25	20.25	24.73	N/A	4.48	0.00	16.42	0.00	0.00
4th QTR Totals	-15.07	54.50	54.50	39.44	0.00	-15.07	0.00	23.64	0.00	0.00
2018 Totals	-356.95	444.80	444.80	87.85	0.00	-356.95	0.00	54.90	0.00	0.00

Note: Negative entries for Total Groundwater Entering Pit indicate that stormwater is entering the rock formation via the pit.

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Davis Water Balance

	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Monitoring Period, Days		31	28	31	30	31	30	31	31	30	31	30	31
Monthly Production, tons	87,122	96,625	69,024	120,887	116,442	155,355	105,812	110,179	128,338	145,132	136,190	145,964	87,649
Product Moisture Content		3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Water Truck Loads		8	14	32	50.5	33	46	140	140	42	63	56	15
Month End Water Elevs.													
1) Freshwater pond, depth to water	14.323	5.863	19.865	19.365	17.802	17.438	18.163	10.568	12.609	17.467	12.621	14.478	20.306
2) Pit Sump, depth to water	2.145	2.202	1.919	4.843	2.231	2.46	2.085	2.204	2.204	7.004	10.204	15.204	19.204
Pond Surface Acres													
1) Freshwater pond	0.937	0.937	0.937	0.937	0.937	0.937	0.937	0.937	0.937	0.937	0.937	0.937	0.937
2) Pit Sump	0.322	0.322	0.322	0.322	0.322	0.322	0.322	0.322	0.322	0.8	0.95	1.1	1.1
Total surface acres	1.259	1.259	1.259	1.259	1.259	1.259	1.259	1.259	1.259	1.737	1.887	2.037	2.037
Pond Water Volume Change													
1) Freshwater pond		-7.927	13.120	-0.469	-1.465	-0.341	0.679	-7.117	1.912	4.552	-4.541	1.740	5.461
2) Pit Sump		0.018	-0.091	0.942	-0.841	0.074	-0.121	0.038	0.000	3.840	3.040	5.500	4.400
3) Change in settling pond storage		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Net Volume Change		-7.909	13.029	0.473	-2.306	-0.267	0.559	-7.078	1.912	8.392	-1.501	7.240	9.861
Water Inputs, ac-ft													
Rural Water		0.649	0.491	0.282	0.323	0.486	0.503	0.643	0.809	0.962	1.224	1.377	1.932
Lake Water		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Well Water		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Precipitation		0.748	52.386	26.013	20.517	92.193	17.526	18.199	43.557	119.160	33.075	1.176	20.251
Total Water Input		1.397	52.877	26.295	20.840	92.680	18.029	18.842	44.366	120.122	34.300	2.553	22.184
Water Usage, ac-ft													
Product moisture content		2.488	1.778	3.113	2.999	4.001	2.725	2.837	3.305	3.738	3.507	3.759	2.257
Haul road dust control		0.246	0.430	0.982	1.550	1.013	1.412	4.296	4.296	1.289	1.933	1.719	0.460
Evaporation losses		0.212	0.006	0.291	0.424	0.572	0.659	0.976	0.689	0.431	0.304	0.344	0.219
Misc usage		-	-	-	-	-	-	-	-	-	-	-	13.87
Total Water Usage, Ac-ft		2.946	2.213	4.386	4.973	5.586	4.795	8.110	8.291	5.458	5.745	5.821	16.804
Net Water Input		-1.548	50.663	21.909	15.867	87.094	13.233	10.732	36.075	114.664	28.555	-3.269	5.380
emergency storage of precipitation and runoff, ac-ft													
Groundwater Inflow		-6.360	-37.635	-21.436	-18.173	-87.361	-12.675	-17.811	-34.162	-106.272	-30.055	10.509	4.481
Groundwater Inflow, Avg Ac-ft/Day		-0.205	-1.344	-0.691	-0.606	-2.818	-0.422	-0.575	-1.102	-3.542	-0.970	0.350	0.145
Groundwater Inflow, Avg Gallons/Day		-66,855	-437,976	-225,323	-197,385	-918,284	-137,670	-187,213	-359,091	-1,154,296	-315,921	114,145	47,103

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Consumptive Use	January	February	March	April	May	June	July	August	September	October	November	December
Water Truck Usage	0.25	0.43	0.98	1.55	1.01	0.48	0.93	0.93	1.29	0.77	0.34	0.12
Moisture Content of Product Shipped	1.88	1.87	2.69	2.80	2.92	2.77	2.45	3.03	3.01	3.41	2.69	2.44
Misc on site use	-	-	-	-	-	-	-	-	-	-	-	-
Misc off site	-	-	-	-	-	-	-	-	-	-	-	13.87
Total	2.12	2.30	3.68	4.35	3.93	3.25	3.38	3.95	4.30	4.18	3.03	16.42

Shipped Tons	January	February	March	April	May	June	July	August	September	October	November	December
Base	16,947	16,864	33,565	40,995	40,262	33,362	26,257	39,602	41,313	50,777	30,377	36,494
Coarse Aggregate	53,012	51,726	64,907	64,036	81,022	67,148	61,331	65,266	57,299	67,267	64,222	61,172
Fine Aggregate	19,776	20,011	26,139	24,118	20,921	27,587	25,927	31,164	32,826	33,073	28,690	18,081
Total	89,735	88,602	124,610	129,150	142,206	128,097	113,516	136,032	131,439	151,117	123,289	115,748
Moisture Shipped	1.88	1.87	2.69	2.80	2.92	2.77	2.45	3.03	3.01	3.41	2.69	2.44

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Land Use	gravel road	
AMC Condition	II (ave)	
CN (pit fringe)	88	area draining into pit
CN (pit)	100	area with direct interception
S (pit fringe)	1.364	area draining into pit
S (pit)	0.000	area with direct interception
Pit - Direct Interception (>95 ft deep)	64.12	subject to refinement
Pit fringe (area drains to pit)	161.49	subject to refinement
Drainage to Pit (total area)	225.61	subject to refinement

Quarry area Fringe area

Date	Precip, in.	Runoff, in.	Runoff, in.	Evapor, in/day
1-Oct	0.00	0.00	0.00	0.10
2-Oct	0.00	0.00	0.00	0.09
3-Oct	0.00	0.00	0.00	0.13
4-Oct	0.00	0.00	0.00	0.10
5-Oct	0.00	0.00	0.00	0.12
6-Oct	0.94	0.94	0.00	0.06
7-Oct	1.10	1.10	0.00	0.05
8-Oct	0.00	0.00	0.00	0.08
9-Oct	0.94	0.94	0.00	0.02
10-Oct	0.00	0.00	0.00	0.09
11-Oct	0.01	0.01	0.00	0.09
12-Oct	0.38	0.38	0.00	0.02
13-Oct	0.94	0.94	0.00	0.01
14-Oct	0.06	0.06	0.00	0.02
15-Oct	0.00	0.00	0.00	0.04
16-Oct	0.00	0.00	0.00	0.04
17-Oct	0.02	0.02	0.00	0.04
18-Oct	0.03	0.03	0.00	0.03
19-Oct	0.79	0.79	0.00	0.01
20-Oct	0.01	0.01	0.00	0.06
21-Oct	0.01	0.01	0.00	0.08
22-Oct	0.00	0.00	0.00	0.07
23-Oct	0.00	0.00	0.00	0.08
24-Oct	0.37	0.37	0.00	0.01
25-Oct	0.08	0.08	0.00	0.03
26-Oct	0.01	0.01	0.00	0.08
27-Oct	0.00	0.00	0.00	0.10
28-Oct	0.00	0.00	0.00	0.10
29-Oct	0.00	0.00	0.00	0.10
30-Oct	0.00	0.00	0.00	0.08
31-Oct	0.50	0.50	0.00	0.02
		6.19	0.00	
Volume, ac-ft		33.08	0.00	1.936
Total Vol, ac-ft		33.08		

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Cashmere Water Resources Board

PIT RUNOFF ASSUMPTIONS		
Hydrologic Soil Group	D	
Land Use	gravel road	
AMC Condition	II (ave)	
CN (pit fringe)	88	area draining into pit
CN (pit)	100	area with direct interception
S (pit fringe)	1.364	area draining into pit
S (pit)	0.000	area with direct interception
Pit - Direct Interception (>95 ft deep)	64.12	subject to refinement
Pit fringe (area drains to pit)	161.49	subject to refinement
Drainage to Pit (total area)	225.61	subject to refinement

Quarry area **Fringe area**

Date	Precip, in.	Runoff, in.	Runoff, in.	Evapor, in/day
1-Nov	0.00	0.00	0.00	0.06
2-Nov	0.00	0.00	0.00	0.10
3-Nov	0.00	0.00	0.00	0.07
4-Nov	0.00	0.00	0.00	0.07
5-Nov	0.00	0.00	0.00	0.10
6-Nov	0.00	0.00	0.00	0.08
7-Nov	0.00	0.00	0.00	0.06
8-Nov	0.01	0.01	0.00	0.02
9-Nov	0.00	0.00	0.00	0.06
10-Nov	0.00	0.00	0.00	0.06
11-Nov	0.00	0.00	0.00	0.05
12-Nov	0.14	0.14	0.00	0.01
13-Nov	0.00	0.00	0.00	0.04
14-Nov	0.00	0.00	0.00	0.05
15-Nov	0.00	0.00	0.00	0.11
16-Nov	0.00	0.00	0.00	0.09
17-Nov	0.00	0.00	0.00	0.08
18-Nov	0.01	0.01	0.00	0.01
19-Nov	0.00	0.00	0.00	0.05
20-Nov	0.00	0.00	0.00	0.05
21-Nov	0.00	0.00	0.00	0.07
22-Nov	0.00	0.00	0.00	0.06
23-Nov	0.00	0.00	0.00	0.12
24-Nov	0.00	0.00	0.00	0.12
25-Nov	0.00	0.00	0.00	0.10
26-Nov	0.00	0.00	0.00	0.05
27-Nov	0.00	0.00	0.00	0.08
28-Nov	0.00	0.00	0.00	0.08
29-Nov	0.00	0.00	0.00	0.10
30-Nov	0.06	0.06	0.00	0.04
		0.00	0.00	
		0.22	0.00	
Volume, ac-ft		1.18	0.00	2.026
Total Vol, ac-ft		1.18		

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Hydrologic Soil Group	D	
Land Use	gravel road	
AMC Condition	II (ave)	
CN (pit fringe)	88	area draining into pit
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S (pit)	0.000	area with direct interception
Pit - Direct Interception (>95 ft deep)	64.12	subject to refinement
Pit fringe (area drains to pit)	161.49	subject to refinement
Drainage to Pit (total area)	225.61	subject to refinement

Quarry area Fringe area

Date	Precip, in.	Runoff, in.	Runoff, in.	Evapor, in/day
1-Dec	0.01	0.01	0.00	0.15
2-Dec	0.00	0.00	0.00	0.06
3-Dec	0.00	0.00	0.00	0.04
4-Dec	0.00	0.00	0.00	0.02
5-Dec	0.00	0.00	0.00	0.05
6-Dec	0.00	0.00	0.00	0.03
7-Dec	0.11	0.11	0.00	0.01
8-Dec	0.45	0.45	0.00	0.00
9-Dec	0.00	0.00	0.00	0.04
10-Dec	0.00	0.00	0.00	0.05
11-Dec	0.00	0.00	0.00	0.07
12-Dec	0.00	0.00	0.00	0.05
13-Dec	1.24	1.24	0.00	0.00
14-Dec	0.42	0.42	0.00	0.01
15-Dec	0.00	0.00	0.00	0.06
16-Dec	0.00	0.00	0.00	0.06
17-Dec	0.00	0.00	0.00	0.04
18-Dec	0.00	0.00	0.00	0.04
19-Dec	0.01	0.01	0.00	0.02
20-Dec	0.00	0.00	0.00	0.07
21-Dec	0.00	0.00	0.00	0.06
22-Dec	0.00	0.00	0.00	0.06
23-Dec	0.00	0.00	0.00	0.05
24-Dec	0.00	0.00	0.00	0.06
25-Dec	0.02	0.02	0.00	0.02
26-Dec	0.85	0.85	0.00	0.00
27-Dec	0.01	0.01	0.00	0.06
28-Dec	0.00	0.00	0.00	0.04
29-Dec	0.00	0.00	0.00	0.02
30-Dec	0.16	0.16	0.00	0.01
31-Dec	0.51	0.51	0.00	0.05
		3.79	0.00	
Volume, ac-ft		20.25	0.00	1.289
Total Vol, ac-ft		20.25		

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