



PETROLEUM MANAGEMENT, INC.

Environmental Services Division

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July 20, 2022

Maryland Department of the Environment
Oil Control Program
Attn: Lindley Campbell
1800 Washington Blvd., Suite 620
Baltimore, MD 21230-1719

**RE: Wiley H. Bates Middle School
701 Chase St., Annapolis
MDE Facility ID# 3200
MDE Case# 18-0559-AA**

LPH System Operation & Recovery Report Monitoring Well Gauging Report

Dear Ms. Campbell,

In accordance with the MDE directives and approved Work Plans, a permanent and active Liquid Phase Hydrocarbon (LPH) recovery system was installed in groundwater monitoring wells MW-1 and MW-2 due to persisting LPH accumulations. The LPH recovery system was activated on 4/29/20 with skimmer pumps deployed at MW-1 and MW-2.

The recovery system was operable on a continuous basis from start-up on April 29, 2020 until June 23, 2021 at which time it was de-activated to allow for groundwater stabilization and monitoring in preparation for the approved groundwater draw-down event that was completed in February 2022. At the time of skimmer system de-activation, there had been a cumulative recovery of 191.75-gallons of LPH with only 36.5 gallons of water as measured on June 23, 2021.

Since completion and review of data collected from the groundwater draw-down event, the skimmer pumps have again been deployed at MW-1 and MW-2 and the recovery system was re-activated for continuous duty on March 11, 2022. Since re-activation, the system has been monitored and MW-1 and MW-2 have been gauged monthly as directed by MDE. Since re-activation of the recovery system, an additional 24-gallons of LPH has been recovered with 0-gallons of additional water. In the last 2 months of monitoring, LPH has been reduced to a heavy oil sheen at both MW-1 and MW-2 with LPH barely measurable at 0.00 to 0.01 feet. Attached are the well gauging logs for MW-1 and MW-2 as well as the recovery log updated since last gauging event on July 20, 2022.

A follow-up Monitoring Well Gauging Report will be submitted again after all recordings for August 2022 have been recorded and following the 3rd Quarter monitoring well gauging event scheduled for late August 2022. The results of the sampling event will be reported in a separate submittal.

Please contact our office with any questions or concerns.

Respectfully submitted,

W. Scott Alexander
Environmental Projects Manager

Enc.

cc: *Mr. Christopher Williams*
Environmental Health & Safety Manager
Anne Arundel County Public Schools
9034 Fort Smallwood Rd.
Pasadena, MD 21122

Bates Middle School- Monitoring Well Gauging Table

MW-1 Top of Casing Elevation, 28.44'

Date	Time	Depth to Liquid (ft.)	Depth to Water (ft.)	LPH thickness (ft.)	Δ GW Elev. (+/- ft.)	GW Elevation	Comment
	12:40	14.31	18.65	4.34		9.79	
11/6/19	12:40	16.85	18.56	1.71	0.09	9.88	Post EFR
2/19/20	7:45	14.40	22.89	8.49	-4.33	5.55	
5/19/20	13:43	14.15	14.24	0.09	8.65	14.20	Genie skimmer pumps activated 4/29/20
7/30/20	10:30	15.21	15.25	0.04	-1.01	13.19	Gauged prior to 8/18/20 sampling.
11/18/20	8:30	13.71	13.73	0.02	1.52	14.71	
11/19/20	9:00	13.62	13.72	0.10	0.01	14.72	Genie skimmer pumps off for 24 hrs from 11/18/20.
2/24/21	12:01	13.55	13.63	0.08	0.09	14.81	
5/19/21	13:28	13.85	13.86	0.01	-0.23	14.58	
6/23/21	13:14	14.05	14.06	0.01	-0.20	14.38	Genie skimmer pumps removed today at 13:00
6/30/21	9:20	13.86	14.12	0.26	-0.06	14.32	
7/7/21	9:37	13.91	14.26	0.35	-0.14	14.18	
7/14/21	11:46	13.93	14.41	0.48	-0.15	14.03	
7/27/21	10:45	14.04	14.92	0.88	-0.51	13.52	
8/11/21	13:30	14.12	15.52	1.40	-0.60	12.92	
8/24/21	13:31	14.17	15.83	1.66	-0.31	12.61	
9/8/21	10:43	14.10	15.68	1.58	0.15	12.76	
9/22/21	9:50	14.17	16.03	1.86	-0.35	12.41	
10/6/21	10:30	14.21	16.19	1.98	-0.16	12.25	*Bailed LPH from well (~1 gal) after gauging.
10/6/21	11:00	16.63	16.95	0.32	-0.76	11.49	*gauged 30 minutes after bailing LPH
10/6/21	12:00	14.41	14.82	0.41	2.13	13.62	*gauged 60 minutes after bailing LPH
10/19/21	12:50	14.39	15.16	0.77	-0.34	13.28	
11/5/21	11:05	14.36	15.20	0.84	-0.04	13.24	
11/16/21	9:13	14.45	15.47	1.02	-0.27	12.97	
12/1/21	15:09	14.49	15.53	1.04	-0.06	12.91	
12/15/21	13:30	14.50	15.64	1.14	-0.11	12.80	
12/29/21	11:52	14.51	15.66	1.15	-0.02	12.78	
1/12/22	16:01	14.38	15.24	0.86	0.42	13.20	
1/25/22	12:00	14.21	14.94	0.73	0.30	13.50	*Week prior to Draw-Down Event
2/2/22	8:00	14.90	15.48	0.58	-0.54	12.96	*Morning prior to Draw Down Event
2/3/22	10:50	14.91	15.02	0.11	0.46	13.42	*Morning after Draw Down Event
2/4/22	6:10	13.78	14.23	0.45	0.79	14.21	*Day after Draw Down Event
2/9/22	13:25	14.53	15.44	0.91	-1.21	13.00	*Week after Draw Down Event
2/15/22	11:08	14.60	16.10	1.50	-0.66	12.34	*2 Weeks after Draw-Down Event
2/23/22	8:33	14.51	16.45	1.94	-0.35	11.99	*3 Weeks after Draw Down Event
4/13/22	11:05	14.12	14.18	0.06	2.27	14.26	QED skimmers re-activated on March 11, 2022
5/25/22	14:27	14.22	14.28	0.06	-0.10	14.16	2nd quarter gauging event
6/30/22	10:35	14.65	14.65	0.00	-0.37	13.79	Monthly follow-up
7/20/22	7:15	14.39	14.4	0.01	0.25	14.04	Monthly follow-up

Bates Middle School- Monitoring Well Gauging Table

MW-2 Top of casing elevation, 28.17'

Date	Time	Depth to Liquid (ft.)	Depth to Water (ft.)	LPH thickness (ft.)	Δ GW Elev.		Comment
					(+/- ft.)	GW Elevation	
8/6/19	12:37	14.05	15.80	1.75		12.37	
11/6/19	12:43	15.02	15.54	0.52	0.26	12.63	Post EFR
2/19/20	7:47	14.16	14.41	0.25	1.13	13.76	
5/19/20	13:35	13.46	13.54	0.08	0.87	14.63	Genie skimmer pumps activated 4/29/20
7/30/20	10:35	13.94	13.98	0.04	-0.44	14.19	Gauged prior to 8/18/20 sampling.
11/18/20	8:30	13.07	13.10	0.03	0.88	15.07	
11/19/20	9:00	13.02	13.07	0.05	0.03	15.10	Genie skimmer pumps off for 24 hrs from 11/18/20.
2/24/21	12:05	13.20	13.25	0.05	-0.18	14.92	
5/19/21	13:30	13.28	13.29	0.01	-0.04	14.88	
6/23/21	13:15	13.50	13.50	0.00	-0.21	14.67	Genie skimmer pumps removed today at 13:00
6/30/21	9:14	13.49	13.50	0.01	0.00	14.67	
7/7/21	9:32	13.51	13.55	0.04	-0.05	14.62	
7/14/21	11:50	13.54	13.58	0.04	-0.03	14.59	
7/27/21	10:48	13.64	13.71	0.07	-0.13	14.46	
8/11/21	13:28	13.72	13.79	0.07	-0.08	14.38	
8/24/21	13:35	13.76	13.82	0.06	-0.03	14.35	
9/8/21	10:40	13.69	13.71	0.02	0.11	14.46	
9/22/21	9:46	13.76	13.81	0.05	-0.10	14.36	
10/6/21	11:05	13.82	13.88	0.06	-0.07	14.29	
10/19/21	12:55	13.85	13.92	0.07	-0.04	14.25	
11/5/21	11:08	13.87	13.92	0.05	0.00	14.25	
11/16/21	9:02	13.95	14.03	0.08	-0.11	14.14	
12/1/21	15:16	13.96	14.19	0.23	-0.16	13.98	
12/15/21	13:26	13.96	14.26	0.30	-0.07	13.91	
12/29/21	11:59	13.97	14.28	0.31	-0.02	13.89	
1/12/22	16:01	13.91	14.41	0.50	-0.13	13.76	
1/25/22	12:05	13.76	14.20	0.44	0.21	13.97	*Week prior to Draw Down Event
2/2/22	8:30	13.83	14.26	0.43	-0.06	13.91	*Morning prior to Draw Down Event
2/3/22	10:51	13.80	14.25	0.45	0.01	13.92	*Morning after Draw Down Event
2/4/22	6:12	14.82	14.99	0.17	-0.74	13.18	*Day after Draw Down Event
2/9/22	13:21	13.67	14.04	0.37	0.95	14.13	*Week after Draw Down Event
2/15/22	11:05	13.71	14.13	0.42	-0.09	14.04	*2 Weeks after Draw Down Event
2/23/22	8:29	13.68	14.16	0.48	-0.03	14.01	*3 Weeks after Draw Down Event
4/13/22	11:10	13.48	13.50	0.02	0.66	14.67	QED Skimmer pumps re-activated March 11, 2022
5/25/22	14:30	13.52	13.53	0.01	-0.03	14.64	2nd qtr gauging event
6/30/22	10:37	13.85	13.85	0.00	-0.32	14.32	Monthly follow-up
7/20/22	7:15	13.69	13.70	0.01	0.15	14.47	Monthly follow-up

BATES MIDDLE SCHOOL
Remediation System Recovery Tank Log

NOTE*QED Skimmer Pumps deployed & activated at MW-1 & MW-2 following final EFR event on 4/29/20. Skimmer floats set at post-EFR groundwater depth of ~14 ft. below top of casing

Date:	Time:	Total Liquid			LPH			Water			LPH	LPH	Comments/Notes:
		inches	gallons	gain (+)	inches	gallons	gain (+)	inches	gallons	gain (+)	thickness MW-1	thickness MW-2	
4/30/2020	10:00	2.5	10	10	2.5	10	10	0	0	0			
5/6/2020	10:30	3.5	16.5	6.5	3.5	16.5	6.5	0	0	0			removed top row of inlet screws at MW-1 skimmer pump
5/13/2020	11:15	5	28	11.5	5	28	11.5	0	0	0	0.15'	0.08'	removed 2nd row of inlet screws at MW-1 skimmer pump
5/19/2020	8:20	6.5	41	13	6.5	41	13	0	0	0			
6/3/2020	9:30	7	46	5	7	46	5	0	0	0	0.06'	0.05'	
6/17/2020	11:30	8	55	9	8	55	9	0	0	0	0.09'	0.05'	removed 2 set screws from 2nd row inlet at MW-2 skimmer
6/30/2020	11:30	8.25	57.5	2.5	8	57	2	0.25	0.5	0.5	0.09'	0.04'	removed 2 set screws from 3rd row inlet at MW-1 skimmer
7/16/2020	10:15	8.5	60.5	3	8.25	60	3	0.25	0.5	0	0.07'	0.04'	removed 2 more screws from 3rd row inlet at MW-1 skimmer
7/30/2020	12:30	8.5	60.5	0	8.25	60	0	0.25	0.5	0	0.04'	0.04'	no skimmer adjustments made this visit
8/18/2020	10:30	9.25	68.5	8	9	68	8	0.25	0.5	0			MW-1 & MW-2 not measured this visit
9/10/2020	10:00	11	88	19.5	10.75	87.5	19.5	0.25	0.5	0	0.12'	0.04'	
9/24/2020	12:15	11.5	93.5	5.5	11.25	93	5.5	0.25	0.5	0	0.09'	0.06'	removed last row of inlet screws at MW-1 and 3rd row at MW-2
10/8/2020	11:30	12	99	5.5	11.75	98.5	5.5	0.25	0.5	0	0.08'	0.04'	
10/20/2020	10:15	12.25	102	3	12	101.5	3	0.25	0.5	0	1.81'	0.03'	*operating PSI at air compressor had decreased to 40 psi
11/10/2020	11:30	13	111	9	12.75	110.5	9	0.25	0.5	0	0.05'	0.04'	
11/18/2020	8:30	13.25	114	3	13	113.5	3	0.25	0.5	0	0.02'	0.03'	New air compressor installed, dedicated to skimmer pumps
12/8/2020	9:30	13.5	117	3	13.25	116.5	3	0.25	0.5	0	0.03'	0.05'	4 rows of skimmer inlets open at MW-1, 3 rows of skimmer inlets open at MW-2
12/23/2020	12:30	13.5	117	0	13.25	116.5	0	0.25	0.5	0	0.02'	0.03'	
1/13/2021	9:15	13.5	117	0	13.25	116.5	0	0.25	0.5	0	0.13'	0.09'	Air compressor had failed (belt failure) sometime since 12/23/20
1/27/2021	1:30	13.75	120	3	13.5	119.5	3	0.25	0.5	0	0.21'	0.14'	
2/10/2021	9:30	13.75	120	0	13.5	119.5	0	0.25	0.5	0	0.20'	0.14'	
2/24/2021	12:00	15	135	15	14.75	134.5	15	0.25	0.5	0	0.08'	0.05'	System recovered from AC Repair. Gauged during quarterly gauging/sampling event
3/3/2021	1:45	21	214	79	15	178	43.5	6	36	35.5	0.49'	0.02'	Pump at MW-1 had failed; debris blockage at pump; clean tank
3/25/2021	11:45	21.25	217.25	3.25	15.25	181.25	3.25	6	36	0	0.04'	0.04'	System operating 100%
4/6/2021	11:30	21.25	217.25	0	15.25	181.25	0	6	36	0	0.02'	0.02'	
4/22/2021	12:00	21.25	217.25	0	15.25	181.25	0	6	36	0	0.01	0.01	
5/6/2021	9:00	21.25	217.25	0	15.25	181.25	0	6	36	0	0.02	0.02	
5/19/2021	1:30	21.75	223.75	6.5	15.75	187.75	6.5	6	36	0	0.01	0.01	Math in cumulative totals corrected for error. Following
6/11/2021	10:00	0.5	1	1	0.5	1	1	0	0	0	0.01	0.01	Following pump out of recovery tank; starting at 0 level; gauging/sampling event
6/23/2021	1:15	1.5	4.5	3.5	1.25	4	3	0.25	0.5	0.5	0.01	0.00	Skimmer pumps removed to allow water table to return to normal
4/13/2022	11:05	4	20	15.5	3.75	18.25	14.25	0.25	0.5	0	0.06	0.02	Skimmer pumps deployed and re-activated on March 11
5/25/2022	15:00	5	28	8	4.75	26	7.75	0.25	0.5	0	0.06	0.01	Gauged during quarterly gauging/sampling event (2nd Casing)
6/30/2022	10:35	5.25	30	2	5	28	2	0.25	0.5	0	0	0	
7/20/2022	7:16	5.25	30	0	5	28	0	0.25	0.5	0	0.01	0.01	Only a heavy oil sheen visible at water surface and a black
Cumulative Totals:				253.75			215.75			36.5			