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TRANSMITTAL LETTER FOR FINAL MONTHLY ACTIVITIES REPORT FOR THE MOBILE
ENHANCED MULTI-PHASE EXTRACTION EVENT CONDUCTED 19 JANUARY 1999
MILLINGTON SUPPACT TN
2/12/1999
BAT ASSOCIATES, INC.

BAT

BAT Associates, Inc.

ENVIRONMENTAL HEALTH & SAFETY SERVICES

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February 12, 1999

Mr. Randy Wilson
Public Works Division - Environmental Department
Code: 101
5720 Integrity Drive
Millington, Tennessee 38054-0306

REFERENCE: CONTRACT NO. N62467-99-R-0867

SUBJECT: FINAL RESULTS OF MOBILE ENHANCED MULTI-PHASE EXTRACTION (MEME) EVENT CONDUCTED JANUARY 19, 1999 AT THE NAVAL EXCHANGE SERVICE STATION, OLD NAVY ROAD, MILLINGTON, TENNESSEE; FACILITY ID NO. 0-791718, SHELBY COUNTY

Dear Mr. Wilson:

Please find attached the data summary for the first MEME event conducted under this contract at the subject site (Figure 1). Field activities were conducted in accordance with BAT's approved final Plan of Action and the Tennessee Department of Environment and Conservation's (TDEC) Technical Guidance Document (TGD)-016.

SUMMARY OF RESULTS

This MEME is the third event that has been conducted at this site. Two previous MEME events have been conducted by other contractors. Those two events were performed January 15 and 16, 1998 and January 29 and 30, 1998.

Separate phase hydrocarbons (SPH) were not detected prior to, or upon completion of, conducting this MEME event. SPH has not been detected prior to the previous two MEME events. This MEME event was performed for a duration of eight hours at ten extraction points, consisting of the initial six hours at monitor wells MEM-1, MEM-2, MEM-3, MEM-7, MEM-8, MEM-12, MEM-13, and MEM-14 and the final two hours at MEM-6 and B-3. Previously, the events were conducted over two days consisting of eight hours at wells MEM-1, MEM-2, MEM-3, MEM-7, MEM-8, MEM-12, MEM-13, and MEM-14 on the first day, and eight hours at wells MEM-6 and B-3 on the second day.

A calculated total of 2,620 pounds of carbon (approximately equivalent to 3,704 pounds of petroleum hydrocarbons - 611 equivalent gallons of gasoline) were removed during this MEME event. This recovered mass/volume of petroleum hydrocarbons represents an increase from the removals achieved during the second event (i.e. a calculated total of 581 pounds of petroleum hydrocarbons - approximately 95 equivalent gallons of gasoline) and the initial event (i.e. a calculated total of 905 pounds of petroleum hydrocarbons - approximately 149 equivalent gallons of gasoline).

A summary of petroleum hydrocarbons removed to date is shown in Table 1.

TABLE 1			
Summary of Petroleum Hydrocarbons Removed			
MEME Event Number	MEME Event Date	Petroleum Hydrocarbons Removed (lbs.)	Equivalent Gasoline Removed (gal.)
1*	January 15 and 16, 1998	905	149
2*	January 29 and 30, 1998	581	95
3	January 19, 1999	3704	611
*Performed by others			

The carbon removal rate ranged for 4 to 1,192 pounds per hour during this MEME event. The removal rate decreased from 1,192 to 129 pounds per hour during the initial five hours and increased to 133 pounds per hour during the final one hour of extraction from MEM-1, MEM-2, MEM-3, MEM-7, MEM-8, MEM-12, MEM-13, and MEM-14. Upon commencement of extraction from MEM-6 and B-3, the carbon removal rate decreased to 6 pounds per hour and generally decreased to 4 pounds per hour during the final two hours of this event. The removal rates ranged higher than those achieved during the third and fourth events (i.e. 3 to 127 pounds per hour) and encompassed the range of removal rates achieved during the initial and second events (i.e. 5 to 165 pounds per hour).

Offgas concentrations ranged from 1,400 to 100,000 ppm during this MEME event. Offgas concentrations decreased from 100,000 to 30,000 ppm during the initial five hours and increased to 36,000 ppm during the final one hour of extraction from MEM-1, MEM-2, MEM-3, MEM-7, MEM-8, MEM-12, MEM-13, and MEM-14. Upon commencement of extraction from MEM-6 and B-3, the offgas concentration initially decreased to 3,600 ppm and generally decreased to 1,400 ppm during the final two hours of this event. These offgas concentrations ranged higher than those recorded during the third and fourth events (i.e. 700 to 20,000 ppm) and during the initial and second events (i.e. 1,400 to 30,000 ppm).

Flow rates attained during this MEME event ranged from 257 to 1,100 CFM (174 to 1,063 DSCFM), including approximately 14 to 34 CFM attributed to atmospheric air inflow at the wellhead breather ports. Breather ports are sometimes utilized to enhance the recovery of petroleum hydrocarbons and/or groundwater. Flow rates were stable at 1,100 CFM during the initial three hours and decreased to 513 CFM during the final three hours of extraction from MEM-1, MEM-2, MEM-3, MEM-7, MEM-8, MEM-12, MEM-13, and MEM-14. Upon commencement of extraction from MEM-6 and B-3, the flow rate initially decreased to 257 CFM and increased to 312 CFM during the final two hours of this event. These flow rates ranged lower than those recorded during the second event (i.e. 477 to 1,100 CFM) and encompassed the range of flow rates recorded during the first event (i.e. 403 to 734 CFM).

The range of vacuum readings recorded at the extraction wells during this MEME event are detailed in the MEME Field Data Sheet and summarized below:

<u>Extraction Well Location</u>	<u>Vacuum Reading</u>
MEM-1	6 to 8 inches of mercury
MEM-2	5 to 7 inches of mercury
MEM-3	4 to 6 inches of mercury
MEM-6	16 to 17 inches of mercury
MEM-7	1 inch of mercury
MEM-8	6-7 inches of mercury
MEM-12	5 to 7 inches of mercury
MEM-13	5 to 6 inches of mercury
MEM-14	5 to 7 inches of mercury
B-3	10 to 11 inches of mercury

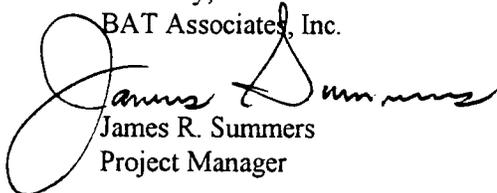
The vacuum readings recorded at extraction wells may have been biased by atmospheric air inflow at the wellhead breather ports.

Differential pressure readings were recorded at MEM-6 during this event to assess the vacuum influence induced by MEME in the vadose zone. A maximum differential pressure of -1.60 inches of water was recorded at MEM-6, located approximately 75 feet from MEM-2, as detailed in the attached table.

Approximately 928 gallons of liquid (SPH was not detected in the vacuum truck tank upon conclusion of MEME) were removed during this MEME event and offloaded to an onsite oil/water separator.

BAT is pleased to provide these services and look forward to serving your organization in the future. Should you have any questions or require additional information, please call Craig Aurin at (423) 481-8105.

Sincerely,
BAT Associates, Inc.



James R. Summers
Project Manager

MF:CA

Attachments

cc: J. Karlyk - Dept. of the Navy (2)
G. Murr - TDEC Memphis
C. Hopper - TDEC Nashville
Project File - 983019

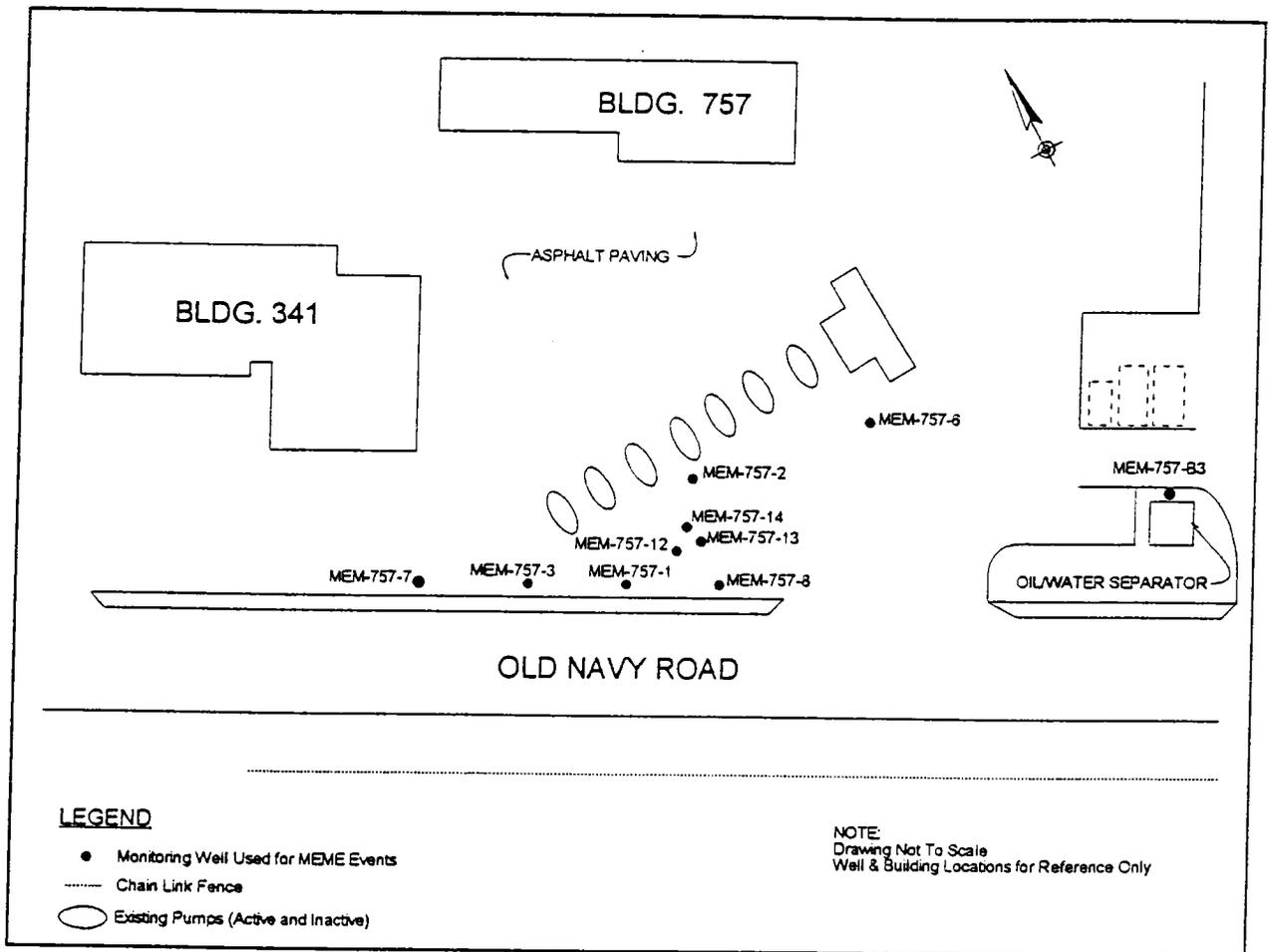


FIGURE 1 - NAVAL EXCHANGE SERVICE STATION; FACILITY ID#0-791718

EFR[®] EVENT GAUGING DATA

Client: BAT Env.		Facility Name: NEX (Navy Exchange) Auto Part/Fuel Lock				Facility ID#: 0-740479		Event #: 5	
Facility Address: 757 Old Navy Road, Millington, Tennessee						Technician: Lewis		Date: 1/19/99	
Well Designation	Well Diameter (inches)	Total Depth (feet)	Before EFR [®] Event			After EFR [®] Event			Depth to Liquid Change (feet)
			Depth to SPH (feet)	Depth to Water (feet)	SPH Thickness (feet)	Depth to SPH (feet)	Depth to Water (feet)	SPH Thickness (feet)	
MEM-1	4"		-	5.07	0.00	-	9.80	0.00	-4.73
MEM-2	4"		-	4.73	0.00	-	9.70	0.00	-4.97
MEM-3	4"		-	4.97	0.00	-	9.40	0.00	-4.43
MEM-5	4"		-	2.60	0.00	-	2.60	0.00	0.00
MEM-6	4"		-	4.68	0.00	-	10.00	0.00	-5.32
MEM-7	4"		-	4.90	0.00	-	7.30	0.00	-2.40
MEM-8	4"		-	5.78	0.00	-	9.70	0.00	-3.92
MEM-10	4"		-	4.60	0.00	-	4.61	0.00	-0.01
MEM-11	4"		-	5.98	0.00	-	5.98	0.00	0.00
MEM-12	4"		-	5.40	0.00	-	10.30	0.00	-4.90
MEM-13	4"		-	5.16	0.00	-	Dry	N/A	
MEM-14	6		-	5.14	0.00	N/A	11.60	0.00	-6.46
B-3	4"		-	3.58	0.00	-	3.57	0.00	0.01
B-4	4"		-	4.09	0.00	-	9.70	0.00	-5.61



Comments:

Differential Pressure and Groundwater Drawdown Data Recorded During EFR®

Event No. 5 (January 19, 1999)
 NEX (Navy Exchange) Auto Part/Fuel Dock
 757 Old Navy Road
 Millington, Tennessee

DIFFERENTIAL PRESSURE DATA

		Well Designation:
		<u>MEM-6</u>
Nearest Extraction Well:		MEM-2
Approximate Distance:		75 feet
<u>Time</u>	<u>Elapsed Time</u>	<u>Differential Pressure Readings (inches of water):</u>
10:00	1.0 hr.	-0.30
10:30	1.5 hrs.	-1.22
11:00	2.0 hrs.	-1.60
11:30	2.5 hrs.	-1.60
12:00	3.0 hrs.	-1.58
13:00	4.0 hrs.	-1.50
Maximum Change:		-1.60

GROUNDWATER DRAWDOWN DATA

		Well Designation:
		<u>MEM-6</u>
Nearest Extraction Well:		MEM-2
Approximate Distance:		75 feet
<u>Time</u>	<u>Elapsed Time</u>	<u>Depth to Liquid (feet below top of casing):</u>
Prior to EFR®		4.68
13:00	4.0 hrs.	4.23
14:00	5.0 hrs.	4.30
Maximum Change:		+0.45