# NEW YORK STATE DEPARTMENT OF TRANSPORTATION Albany, New York

Harrison Subresidency Town of Harrison Westchester County, New York

D008873 PIN 8807.31.301

# parging and Soil Vapor Extraction System **on and Maintenance Report** for January 2002

**July 2002** 

### LAWLER, MATUSKY & SKELLY ENGINEERS LLP

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7/24/02 Project No. 446-311

Mr. John LaBarge Acting Director, Consultant Management Bureau NYS Dept. of Transportation 1220 Washington Avenue Albany, NY 12232

Attn: Greg Menard

Re: D012589, PIN 8007.31.101

Harrison Petroleum Spill - Remediation

Town of Harrison, Westchester County, New York

Air Sparging/Soil Vapor Extraction System

Monthly Operations & Maintenance Report #13 (Jan 2002)

Dear Mr. Menard:

Lawler, Matusky & Skelly Engineers LLP (LMS) is pleased to submit the subject report for your use. The purpose of this report is to present the information necessary to assess the operation of the air sparging/soil vapor extraction system, to track the progress of the remediation, and to make recommendations to increase operating efficiency or lower operating costs.

The soil vapor extraction system was operated continuously in January 2002 until January 18, when it was shut down to facilitate groundwater monitoring. The air sparge system had been shut down since November 8, 2001 in preparation for January 2002 groundwater monitoring, and remained off-line through the entire month of January. The third groundwater monitoring round was conducted on January 23 and 24 and the results are presented in this report.

Groundwater contaminant concentrations remain low across the site. Now would be a prudent time to begin discussions with the New York State Department of Environmental Conservation (NYSDEC) about transitioning from mechanical remediation to natural attenuation, and eventual site closure. We recommend that the New York Department of Transportation (NYSDOT) arrange a formal conversation with NYSDEC, wherein NYSDOT would propose continued operation of the air sparge/SVE system until the beginning of August 2002, with the next (fourth) groundwater sampling round to be conducted in late October 2002. We would be pleased to support you in this dialogue with NYDEC. The Air

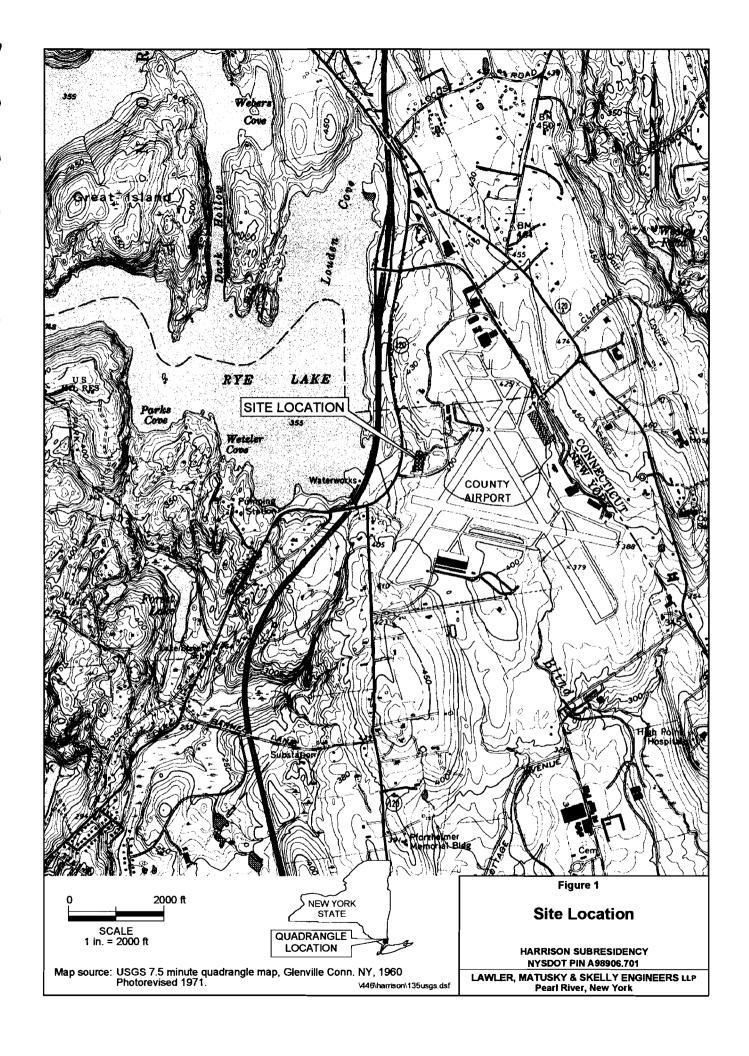
Sparge/SVE system would then continue to remain off-line until after the fourth round results are analyzed. If concentrations remain at or below current levels, then with the approval of NYSDEC the system would remain off. A schedule for post-remedial groundwater monitoring toward site closure would be proposed at that time.

If you have any questions, please call Ruth Fritsch or me at (845) 735-8300.

Very truly yours,

George G. Gattullo

cc: David Wohlbach, NYSDOT (6 copies)
Mauricio Roma, Environmental Analysis Bureau (1 copy)



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### CHAPTER 1

### SUMMARY OF PERFORMANCE MONITORING THIRD ROUND (JANUARY 2002)

### 1.1 OBJECTIVE

The third round sampling was conducted on January 23 and 24, 2002. The objectives of this sampling event were:

- to assess the remediation efforts of the air sparge/soil vapor extraction (AS/SVE) system thus far and evaluate the potential for discontinuing of mechanical remediation;
- to assess the radius of influence (ROI) afforded by the existing air sparge wells and to assess the performance of the three (out of four) operational air sparge wells:
- to qualitatively assess the level of biodegradation present;
- to assess whether rebounding of contaminant concentrations has occurred.

### 1.2 SAMPLING PLAN

Monitoring wells 1 through 9 and sparge wells SP-1 through 4 were sampled and analyzed for benzene, toluene, ethyl-benzene, xylenes (BTEX), methyl tert-butyl ether (MTBE), and naphthalene in addition to standard water chemistry parameters (to assess the extent of biodegradation). Table 1-1 shows the sampling matrix.

### 1.3 SAMPLING METHODS

The air sparge system was shut down approximately 11 weeks in advance of this third round sampling event, the soil vapor extraction system was shut down approximately one week in advance.

Static water levels were first measured in each of the wells; the results are summarized in Table 1-2. Groundwater samples were collected by purging each well a minimum of three well volumes or purging the well dry and allowing the well to recover prior to

TABLE 1-1
Harrison Subresidency Spill Site
Harrison, New York
Compliance Groundwater Sampling Matrix

Parameter	Matrix	Container	Analytical Method	Preservative	Holding Time	Number of samples	Remarks
BTEX MTBE Naphthalene	Aqueous	3, 40 ml glass vials with teflon caps and septa	USEPA 8260B	cool 4 C	7 days	15	
Iron (total)	Aqueous	500 mL polyethylene	USEPA 6010B	HNO <sub>3</sub> , cool 4 C	28 days	15	
Iron* (disolved)	Aqueous	500 mL polyethylene	USEPA 6010B	cool 4 C	ASAP	15	To be filtered and preserved by Mitkem
Nitrate-nitrite Nitrogen	Aqueous	250 mL polyethylene	USEPA 353.2	H2SO₄ to pH<2, cool to 4 C	28 days	15	
Sulfate	Aqueous	500 mL polyethylene	USEPA 9056	cool 4 C	28 days	15	
тос	Aqueous	1, 40 mL glass vials with teflon caps and septa	USEPA 415.1	HCl to pH<2, cool to 4 C	28 days	15	
CO <sub>2</sub>	Aqueous	*250 mL Amber (narrow top) with teflon caps and septa	USEPA 4500- CO2D	cool 4 C	24 hours	15	*Fill jar all the way to the top.
Trip Blank	Aqueous	2, 40 ml glass vials with teflon caps and septa	USEPA 8260B	cool 4 C	7 days	1	Prepared by Mitkem

sample collection. Purging was performed by submersible low-flow pump, or by hand-bailing the well with dedicated disposal bailers. Groundwater samples were collected using 0.5-in. or 1.5-in. diameter dedicated disposable bailers. Temperature, pH, conductivity, salinity, oxidation-reduction potential (ORP), dissolved oxygen (DO) and turbidity were recorded during well purging and before sampling. These standard parameters were recorded in the well sampling logs, which are located in the Attachment B. Dissolved oxygen was measured in the field and was recorded during sample collection. The meter was decontaminated and re-calibrated between samples.

The samples were transferred directly into the sample container and labeled with the site name, job number, sample location/identification, date, time, sampler, and parameters for analysis. The samples were then placed into coolers, cooled to less than 4°C, and submitted under chain-of-custody protocol to a New York State Department of Health (NYSDOH) certified laboratory (Mitkem Corporation, Rhode Island). The results were received from the laboratory on February 11 and 27, 2002.

#### 1.4 SUMMARY OF ANALYTICAL RESULTS

The analytical data from the four rounds of groundwater samples to date are presented in Attachment A. BTEX and MTBE results are specifically summarized in Table 1-3. Figure 1-1 provides a graphical representation of the BTEX and MTBE results.

In the past, there have been some anomalies in the MTBE data, which resulted in concentrations that were biased high due to gas chromatography (GC) shifts. For example, a comparison of the 2000 MTBE sampling results to the 1999 results suggested a marked increase in MTBE concentrations. Since such a large increase in MTBE concentrations seemed unlikely, the laboratory was contacted to verify sample results. The laboratory noted that groundwater samples collected for volatile organic compounds (VOC) analyses were previously analyzed using GC methodology. However, as a result of elevated analyte concentrations and what the laboratory has described as complex chromatograms, two samples, MW-3 and MW-8 were also analyzed by GC mass spectrometry (MS) methods. Subsequent review of the GC/MS results indicated that MTBE was detected in MW-8 at 2.86  $\mu$ g/L and not detected in MW-3; the initial GC results indicated that MW-8 contained 68  $\mu$ g/L and MW-3 had 50  $\mu$ g/L of MTBE. The difference in the reported GC results and the GC/MS results was attributed by the contract laboratory to a minor retention time shift on the GC chromatograms. The

TABLE 1-2
STATIC WATER LEVEL & DEPTH TO BOTTOM MEASUREMENTS
Harrison Subresidency
1/23/02

Well ID	DTW (Jan 2002)	DTW (May 2001)	DTW (Jan 2001)	DTW (May 2000)	DTW (March 1999)	DTW (MAY 1997)	DTW ( Nov 1995)	DTB
PC-1	NA	6.55	4.58	5.22	3.95	NA	NA NA	6.87
SP-1	5.60	4.46	7.25	12.86	2.70	3.04	NA	19.18
SP-1B	NA	4.83	NA	4.58	2.64	NA	NA	26.77
SP-2	8.17	6.87	NA	9.00	5.82	5.94	NA	18.48
SP-3	8.00	6.78	NA	6.89	6.00	NA	NA	19.95
SP-4	6.42	4.40	NA	17.42	3.54	NA	NA NA	20.90
MW-1	4.49	3.37	2.87	2.78	1.23	1.70	2.92	8.58
MW-2	6.00	4.89	4.57	3.86	2.44	NA	4.53	10.79
MW-3	6.00	4.88	4.70	4.18	2.91	3.08	4.94	10.75
MW-4	5.98	4.95	4.73	4.31	3.30	NA	4.82	11.62
MW-5	6.35	5.10	4.89	4.87	3.68	NA	5.26	11.00
MW-6	7.13	5.20	5.26	4.95	4.20	NA	5.43	14.77
MW-7	6.97	4.56	3.90	3.60	2.32	2.67	4.47	14.67
MW-8	8.29	6.87	7.36	6.86	5.98	6.40	7.21	14.57
MW-9	8.43	7.23	7.25	6.61	6.27	NA	NA_	13.74

DTB = depth to bottom (feet)

DTW = depth to water (feet)

Shaded values indicate that well recharge was likely adversely influenced and DTW is not representative.

NA = not available

chromatograms for the remaining wells also exhibited a complexity similar to those of MW-3 and MW-8; however, GC/MS confirmations were not performed on these samples at that time.

The reported values for MTBE listed in Attachment A for the May 2000 and the January 2001 data likely have a positive bias similar to that of MW-3 and MW-8. Therefore, it was likely that MTBE, if present at all, was only present in trace amounts in the past sampling events. GC/MS data from the second and third rounds confirms this. MTBE concentrations detected in the second round were well below the target level of 50  $\mu$ g/L (MW-7, SP-2 and SP-3 exhibited MTBE at concentrations of less than 20  $\mu$ g/L). MTBE was not detected in any of the samples collected in January 2002. Overall, second and third round results indicate that the MTBE target effluent goal of 100  $\mu$ g/L was met at all sampled locations.

Reported values for BTEX continue to show an overall decrease across the site. In order to assess the effects of rebounding, the second round groundwater samples were collected shortly after the remedial system was shut down, as a result these values are probably biased low (see Section 1.5).

BTEX and MTBE concentrations, where notable, are summarized on a per-well basis below:

- MW-1 BTEX concentration was non-detectable. MW-1 is located upgradient of the known plume area. First round sampling revealed MTBE at a concentration of 54 μg/L. As described above, this result is questionable; second and third round results show MTBE to be non-detectable in MW-1.
- MW-2 BTEX concentration was non-detectable. MW-2 had a baseline BTEX concentration of 16.6  $\mu$ g/L and a first round concentration of 4  $\mu$ g/L.
- MW-3 BTEX concentration was 156 μg/L (down from 174 μg/L in the second round). MW-3 is located in the center of the plume. The baseline BTEX concentration was 960 μg/L. First round results showed BTEX at 2.0 μg/L, which demonstrates that some rebounding did occur in the second and third rounds. Most of the remaining contamination is in the form of xylene, which is the most

- difficult compound of the BTEX group to remediate, so these results are not unexpected. An 84% removal of BTEX has been achieved in MW-3 thus far.
- MW-4 BTEX concentration was non-detectable. The baseline concentration was  $39.4 \,\mu\text{g/L}$ .
- MW-5 BTEX concentration was 4 μg/L (down from 233 μg/L in the second round). MW-5 is located in what was previously the center region of the plume, but is currently somewhat side-gradient to the most contaminated region (see Figure 1-2). The absence of rebounding in the third round, however, indicates that the implemented remedial actions have been effective at this well. All of the remaining BTEX contamination at this well is xylene. A near 100% removal of BTEX has been achieved in MW-5 thus far.
- MW-6 BTEX concentration was 30 μg/L (up from 6 μg/L in the second round). MW-6 has not exhibited BTEX concentrations near or above the target criteria of 100 μg/L since the May 2000 baseline sampling.
- MW-7 BTEX concentration has remained non-detectable, since the baseline sampling (May 2000), when it was 17.9  $\mu$ g/L.
- MW-8 BTEX concentration was 7 μg/L (down from 36 μg/L in the second round). The baseline BTEX concentration was 396 μg/L. First round results showed BTEX concentrations were non-detectable, which demonstrates that some rebounding did occur in the second and third rounds. All of the remaining BTEX contamination is xylene. A 98% removal of BTEX has been achieved in MW-8 thus far.
- MW-9 This well continues to show non-detectable levels of BTEX and MTBE.
- PC-1 This well was not sampled in the second and third rounds because the well was dry and a representative sample could not be obtained. The baseline BTEX and MTBE concentrations in this well were non-detectable.
- SP-1 BTEX concentration was 3  $\mu$ g/L (up from non-detectable in the second round, but still well below the target criteria of 100  $\mu$ g/L). The baseline BTEX

concentration was 31  $\mu$ g/L and well SP-1 has exhibited BTEX concentrations of non-detectable or near non-detectable for every subsequent sampling round.

- SP-1B This well was not sampled in the third round because the well was not accessible. Well SP-1B has historically exhibited BTEX and MTBE concentrations of 5 µg/L or less.
- SP-2 BTEX concentration was 58 μg/L, which represents an overall decrease in BTEX since the baseline study, when it was 217 μg/L. The second round BTEX results were non-detectable. Well SP-2 is about 80 feet downgradient to the center of the plume. The increase in concentration from the second round may be attributable to the longer elapsed time between system shutdown and groundwater sampling that was allowed for the third round. A 73% removal of BTEX has been achieved in SP-2 thus far.
- SP-3 BTEX concentration was non-detectable (down from 15 μg/L in the second round). The baseline BTEX concentration was 586 μg/L. A near 100% removal of BTEX has been achieved in well SP-3 thus far
- SP-4 BTEX concentration was 5  $\mu$ g/L (up from non-detectable in the second round, but still well below the target criteria of 100  $\mu$ g/L). The baseline BTEX concentration was 75  $\mu$ g/L. A 93% removal of BTEX has been achieved in well SP-3 thus far.

During the second and third round, naphthalene was detected in some samples while conducting analysis for volatile compounds via Method 8260B (see Section 1.5). Due to the nature of this analytical method with respect to naphthalene, however, these results are considered suspect, and quantities obtained via Method 8270 should take precedence. This phenomenon is evident when comparing these results to those obtained using both methods during the second round. Further analysis for naphthalene will be conducted via Method 8270.

Attachment D presents the raw analytical data.

### TABLE 1-3 MONITORING WELL DATA SUMMARY ROUND 3 (JAN 2001) Harrison Subresidency

MONITORING	BASELINE	Round 1	Round 2	Round 3	- %
WELLS	(May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	REMOVAL
<u>BTEX μg/L</u>					
MW-1	ND	ND	ND	ND	100%
MW-2	17	4	ND	ND	100%
MW-3	960	2	174	156	84%
MW-4	39	2	2	ND	100%
MW-5	916	45	233	4	100%
MW-6	225	21	6	30	87%
MW-7	18	ND	ND	ND	100%
MW-8	396	ND	36	7	98%
MW-9	ND	ND	ND	ND	100%
PC-1	ND	ND	NA	NA	-
SP-1	31	ND	ND	3	90%
SP-1B	5	NA	5	NA	-
SP-2	217	NA	ND	58	73%
SP-3	586	NA	15	ND	100%
SP-4	75	NA	ND	_ 5	93%

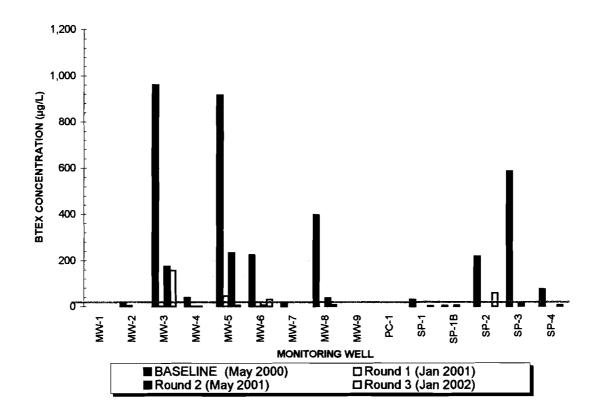
AVERAGE (w/ND's)	233	8	33	20	94%
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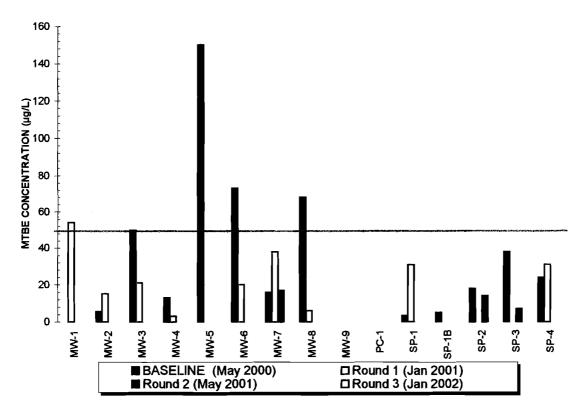
MONITORING	BASELINE	Round 1	Round 2	Round 3	%
WELLS	(May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	REMOVAL
MTBE (μg/L)					
MW-1	ND	54	ND	ND	100%
MW-2	6	15	ND	ND	100%
MW-3	50	21	ND	ND	100%
MW-4	13	3	ND	ND	100%
MW-5	150	ND	ND	ND	100%
MW-6	73	20	ND	ND	100%
MW-7	16	38	17	ND	100%
MW-8	68	6	ND	ND	100%
MW-9	ND	ND	ND	ND	100%
PC-1	ND	ND	NA	NA	-
SP-1	3	31	ND .	ND	100%
SP-1B	5	NA	ND	NA	-
SP-2	18	NA	14	ND	100%
SP-3	38	NA	7	ND	100%
SP-4	24	31	ND	ND	100%
				_	
AVERAGE (w/ND's)	31	18	3	0	100%

### Notes:

- 1. Bolded values exceed clean up goal of 100 µg/L for BTEX and 50 µg/L for MTBE.
- 2. Red font denotes active quarter.

FIGURE 1-1
GROUNDWATER MONITORING - THIRD ROUND RESULTS (JAN 2002)
Harrison Subresidency





Target effluent goal (100 μg/L for BTEX and 50 μg/L for MTBE)

### 1.4.1 Biodegradation Considerations

Bioremediation indicators were also analyzed during the third quarter sampling event. These included carbon dioxide (aqueous), nitrates/nitrites, total organic carbon (TOC), dissolved iron, total iron, sulfate and dissolved oxygen. In general, the indicators used to measure the level of insitu biodegradation are:

- Increase in bacteria population;
- Changes in electron acceptor concentrations, usually depletion of the electron acceptor coupled with a decrease in contaminant concentrations;
- Increases in by-products of biodegradation (carbon dioxide and methane concentrations);

TOC and the surrounding soil formation play important roles in biodegradation. In general, there is a correlation between a decrease in contaminant concentration with an increase in bacteria population, however, it should be noted that because of natural variations on bacteria populations, it is usually difficult to establish a significant trend, especially over short periods of time. We did not conduct any population studies at this site this sampling period.

Electron acceptor concentrations may increase or decrease with contamination reduction. In aerobic remediation, oxygen acts as the terminal electron acceptor; it takes about 3 pounds of available oxygen to convert 1 pound of hydrocarbon to carbon dioxide and water. In anaerobic bioremediation, alternate or substitute electron acceptors are used in place of oxygen. These include, in order of preference, nitrate, manganese, iron oxides, sulfate and carbon dioxide.

In general, the use of a particular electron acceptor is a function of its abundance and the surrounding environment's ORP. Table 1-4 shows the ORP readings for each well as compared to the previous sampling round. The ORP values measured in the field range from -0.05 volts to +0.125 volts. An ORP in the range of about -0.2 to 0.7 represents anaerobic conditions in which alternate electron acceptors like nitrates and carbon dioxide, etc. are used in degradation. The ORP readings are generally outside the published range for carbon dioxide reduction, which is typically about -0.1 to -0.3. Only MW-3 ORP readings approach that range, but that well shows a marked increase in carbon dioxide suggest production due to bioremediation and not consumption.

TABLE 1-4

### OXIDATION-REDOX POTENTIAL (ORP) QUARTER 2 SAMPLING RESULTS Harrison Subresidency

Location	ORP (volts) 2002	ORP (Volts) 2001	Comments (compared to last period)
MW-1	+0.125	0.10	No appreciable change
MW-2	-0.060	-0.10	No appreciable change
MW-3	-0.095	-0.11	No appreciable change
MW-4	+0.100	0.03	0.70 increase
MW-5	-0.05	-0.13	-0.08 decrease
MW-6	-0.05	-0.13	-0.08 decrease
MW-7	-0.05	-0.07	No appreciable change
MW-8	-0.05	-0.02	No appreciable change
MW-9	+0.025	0.03	No appreciable change
SP-1	+0.125	-0.09	+0.134 increase
SP-1B	_	-0.03	
SP-2	-0.025	-0.03	No appreciable change
SP-3	-0.055	-0.05	No appreciable change
SP-4	-0.078	-0.05	No appreciable change
DW-1		-	

### NOTES:

= Not available

The January 2002 analytical results suggest that site microbes are degrading BTEX. The following observations suggest petroleum-product biodegradation:

- (Nitrification) Nitrate is reduced or depleted in wells near, or immediately adjacent to, the plume, downgradient of the former tank area.
- High levels of CO<sub>2</sub> in the area of highest contamination (MW-3) associated with very low levels of oxygen (2nd lowest value at this well). Perhaps, this could be related to bioremediation processes when the sparge system is operating.
- (Fe-III Reduction) As compared to background (MW-1), high levels of dissolved iron at many of the wells in or near the plume (MW-2, -4, -5, -6, -7, and SP-4) suggest FE-III reduction some areas of the plume.

Subsequent to the startup of this remediation system, it appears that the BTEX (electron donor) mass is being degraded by denitrifying (electron acceptor) anaerobic biological processes. The up-gradient background well (MW-1) has high levels of nitrate, and water down gradient of the former location of the tanks has been depleted of nitrate. Also, the water temperature is generally higher in the area of the plume than in the background.

In contrast, it appears that prior to the startup of the remediation system, sulfate reduction was the process that contributed to most of the BTEX degradation, followed by nitrification and, occasionally, by iron-III reduction. Sulfate concentrations during the January 2002 sampling round appear to be highly variable and, as a result, it seems that SO<sub>4</sub> may be playing less of a role in plume biodegradation, then what was observed in May 2001.

At this site, it is likely that aerobic conditions exist at the filter packs and surrounding formation when the system is running and that anaerobic conditions exist beyond the influence of the air sparge and when the system is not running. A change in the subsurface conditions (i.e. from aerobic conditions to anaerobic conditions) would impact the biomass populations.

DO concentrations were also measured in the field, but may not representative of the aquifer DO concentrations due to the method used in the analysis. During monitoring a cup was filled with the purge water and the sample was likely aerated as a result of the

## TABLE 1-5 DISSOLVED OXYGEN CONCENTRATIONS ROUND 3 SAMPLING RESULTS Harrison Subresidency

WELL ID.	Dissolved Oxygen Concentration (µg/L)
MW 1	8.3
MW 2	3.6
MW 3	3
MW 4	3.9
MW 5	9
MW 6	3.5
MW 7	3.4
MW 8	4.5
MW 9	12.3
PC 1	NA
SP 1	2.3
SP 1B	NA
SP 2	4
SP 3	5.7
SP 4	4.2

collection technique. Nonetheless, the sample collection was consistent for all samples suggesting that the concentration may be biased high, but the trend in the aquifer remains the same. Table 1-5 highlights the dissolved oxygen concentrations observed during the third period sampling. The data suggest that the dissolved oxygen is depleted in the center of the plume area (MW-3), suggesting increased biological activity in that area; the exception being MW-5 which measured a dissolved concentration of 9.0 mg/L.

In general, the biodegradation data collected herein does suggest increased biodegradation and the data shows that some degradation trends can be observed. Most monitoring wells have second and third period biodegradation data and the following general trends were observed:

- TOC concentrations increased in 3 of 9 monitoring wells;
- Carbon dioxide concentrations decreased in 8 of the 9 monitoring wells;
- Sulfate concentrations were generally higher in 5 of the 9 wells;
- Nitrate concentrations were generally higher in 4 of the 9 wells;
- Total and dissolved iron concentrations were significantly higher in 7 of 9 wells. This is probably related to purging conducted at each well; turbidity readings were higher this period as compared to the last and the wells with very high iron (e.g. MW-2) are noted to have been bailer-dry suggesting sediment from the well bottom may have infiltrated the sampled water.

A marked increase in TOC concentrations was also observed in MW-3. This increase in TOC may be due to an increase in biomass resulting from the available food source (or contamination) present around the well. As the system goes from aerobic to anaerobic conditions, respiration (or expiration) of the microorganisms can be expected. Respiration of the biomass may also explain the slight increase in sulfate concentrations observed in MW-3. MW-3 affords the most opportunity for bioremediation since it is the last location where a food source (BTEX) exists to any appreciable extent. As the remediation progresses, the amount of available substrate decreases which may result in a decrease in biodegradation. However, the amount of contamination at the outset of this project (say, 1 mg/L in the center of the plume) was not a significant amount of the substrate to begin with, so a significant decline in biodegradation is not expected when the system is restarted.

### 1.5 DISCUSSION

Concentrations of volatile organic contaminants in groundwater can increase (or rebound) after air sparge system operation has ceased. For this reason, it is important to allow sufficient time to elapse between air sparge system shutdown and confirmation sampling using conventional groundwater monitoring wells. A waiting period of 4 to 48 weeks may be necessary before representative confirmatory samples can be collected. In order to determine the appropriate waiting period for this site, the interval prior to groundwater sample collection has been increased with each consecutive sampling round. The first-round samples were collected the day after the air sparge system was shutdown; the second-round samples were collected 4 weeks after shutdown of the air sparge system; and the third-round samples were collected after an 11 week interval.

The baseline sampling (May 2000, prior to startup of the AS/SVE system) revealed that 6 wells exceeded the BTEX effluent goal of 100  $\mu$ g/L, and 1 wells exceeded the MTBE effluent goal of 100  $\mu$ g/L. The first round results, from January 2001, generally showed significant reductions in BTEX and MTBE, with all samples meeting the target effluent criteria. It is likely that the first round results are biased low, due to the relatively short interval before sampling, in January 2001. A short pre-sampling interval was applied in January 2001 to create a benchmark, against which to analyze the effects of rebounding in subsequent rounds.

The second-round results indicated that rebounding was a factor at two wells where samples exceeded the target effluent goals for BTEX. In both of these cases, the total BTEX concentration reported in May 2001 was significantly lower than in May 2000. MTBE, where detected, was well below the 50  $\mu$ g/L effluent goal for all samples collected during the second round.

The third-round results indicate that concentrations continue to decrease and remain below the target effluent goals across the site. Only wells MW-3 and possibly SP-2 exhibited any significant evidence of rebounding in the third round, with reported BTEX concentrations of 156  $\mu$ g/L and 58  $\mu$ g/L, respectively. Of these wells, only at MW-3 did concentrations exceed the target effluent goal of 100  $\mu$ g/L for BTEX. During the first round (when only a brief interval was allowed between shutdown and groundwater sampling) well MW-3 exhibited a BTEX concentration of 2  $\mu$ g/L; well SP-2 was not sampled during the first round. Third round concentrations at both of these locations

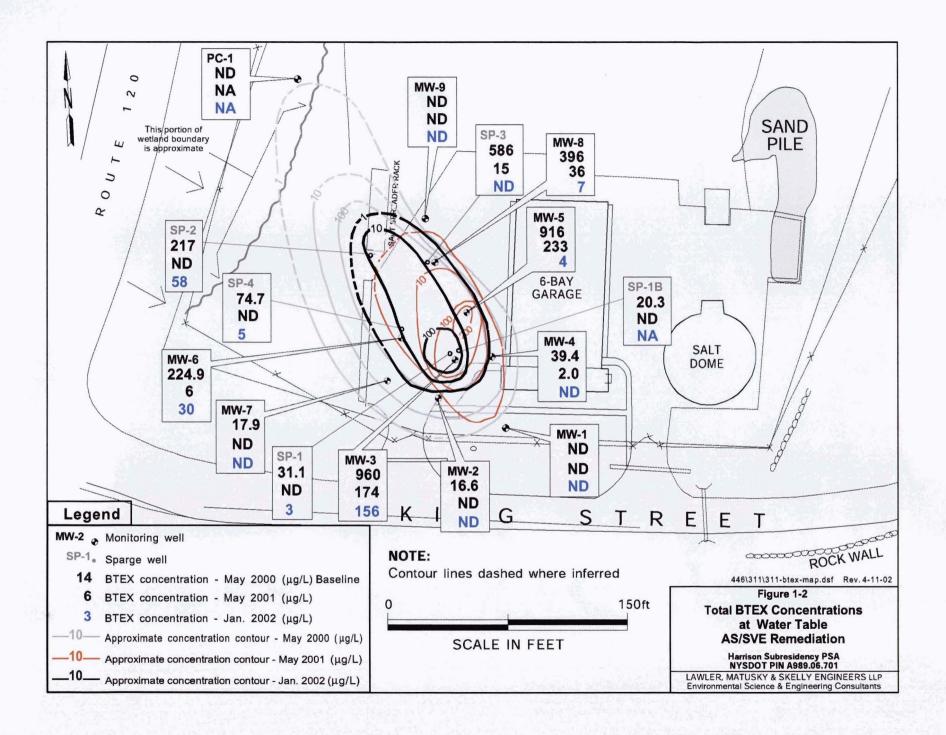
were greatly reduced from what they had been during the baseline sampling. The second round concentrations at these wells were  $174 \mu g/L$  and "ND", respectively. Third round sampling reveals that virtually all sampled monitoring wells show an 85% - 100% reduction in BTEX concentrations, with an overall average reduction of 94%. MTBE was not detected in any wells during the third round. Figure 1-5 depicts the overall decreasing trend in BTEX concentrations over time in the most significant wells.

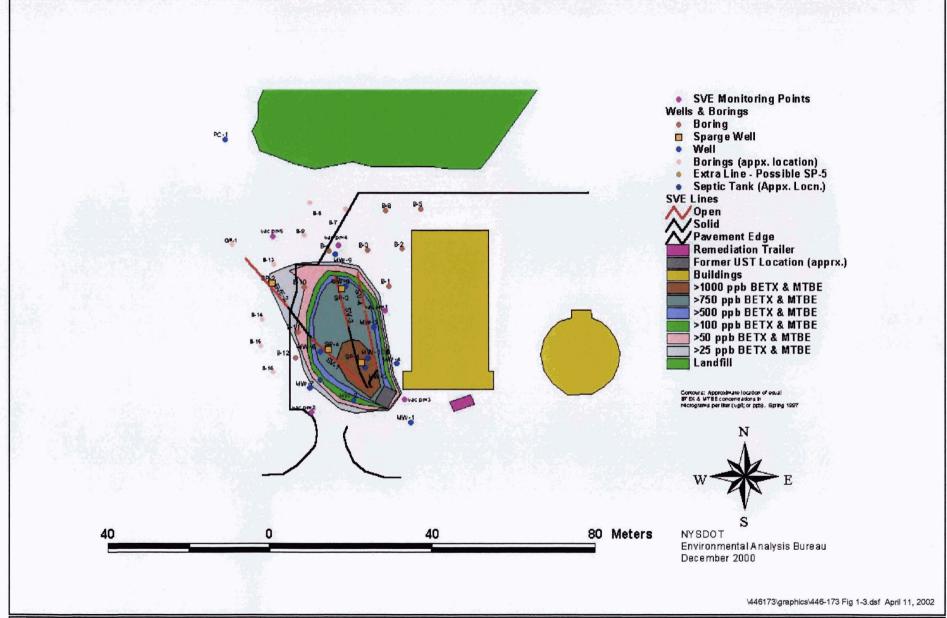
MTBE was analyzed using a mass spectrometry method during the second round and third round sampling events. This reinforces the premise that the previous MTBE data analyzed using gas chromatograph methods may be unreliable.

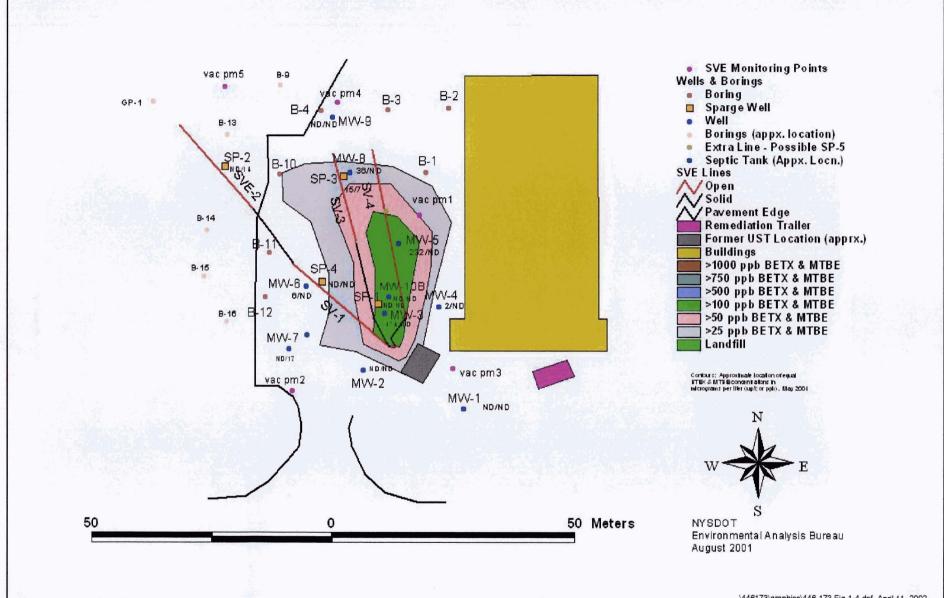
Figure 1-2 (BTEX plume) shows the contamination plume developed from the baseline data; the second and third round results are overlaid onto the plume maps. An isopeth map for MTBE was not prepared since MTBE was not detected at any monitoring points. Figures 1-3 and 1-4 show the BTEX/MTBE plume from spring 1997 and May 2001, respectively. The figures were generated using GIS technology and show the significant reduction of concentrations in the plume.

Naphthalene and 2-methylnapthalene were known to be present at this site, therefore, the sampling program was expanded during the second round of sampling to include these parameters. Semi-volatile analyses of naphthalene and 2-methylnapthalene during the second round indicated that the concentrations of each were non-detectable in all sampling locations, except for well MW-5, where a concentration of 10  $\mu$ g/L was reported for 2-methylnapthalene (well below the target criteria of 50  $\mu$ g/L). The target effluent goal for Naphthalene is 25  $\mu$ g/L. The next groundwater sampling event will include a final round of semi-volatile analyses via Method 8270 for these parameters.

During rounds two and three, naphthalene was also included in the volatiles analyses, and the results are presented in Attachment A. A target effluent criteria is not presented for naphthalene as a volatile compound because it is widely accepted that, due to the fact that naphthalene occurs at the tail-end of the volatiles scan, reported concentrations of naphthalene as a volatile organic compound are suspect.

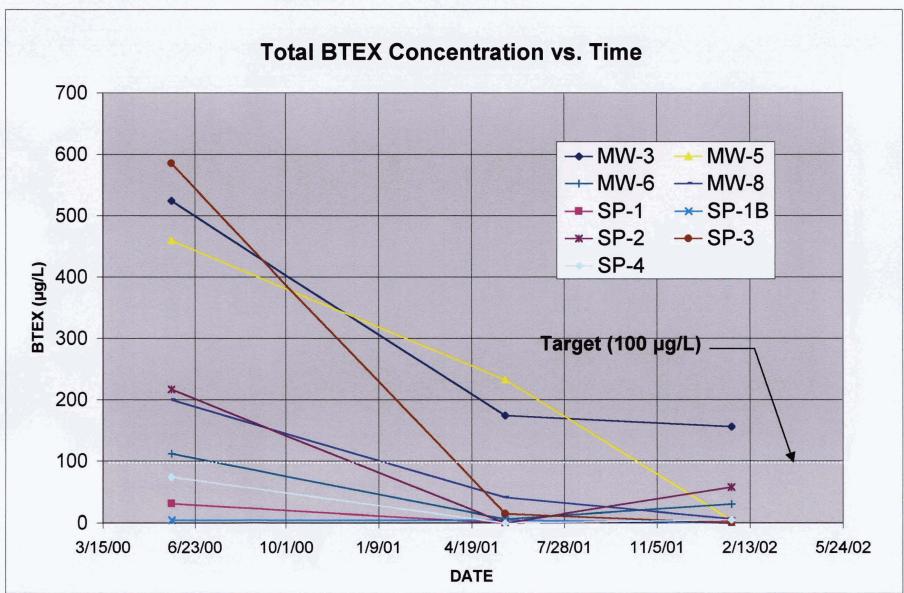






\446173\graphics\446-173 Fig 1-4.dsf April 11, 2002

Figure 1-5
DECAY OF BTEX CONCENTRATION IN GROUNDWATER
Harrison Subresidency



Note - Jan 2001data not plotted due to potential low-bias.

### 1.6 FINDINGS AND CONCLUSIONS

- The results demonstrate effective remediation throughout the plume area with no evidence of any off site migration, although some rebounding did take place at wells SP-2 and MW-3. On average, there has been a 100% reduction in MTBE concentrations and a 94% reduction in BTEX concentrations across the site.
- As demonstrated in Figure 1-6 (BTEX Hydrographs for selected wells), there does not appear to be a correlation between water table elevation and contaminant concentration. This is further indication that remedial efforts have been successful and that the decreases in contaminant concentrations are not a result of fluctuations in the water table.
- There were some changes in static water table elevation between the baseline sampling event and the three rounds of groundwater sampling. In general, the static water table was approximately 18 inches to 26 inches lower in January 2002 when compared to May 2000. The depth to water measurements associated with SP-1, SP-2, SP-4 in May 2000 appear to be artificially low, probably due to poor recharge in these wells. Sparge wells have been included in the sampling program to provide a more detailed qualitative picture of groundwater concentrations across the site. Due to the differences in their construction, however, analytical groundwater data from sparge wells may not be quantitatively representative of actual concentrations. Table 1-2 shows the static water elevation data. Figure 1-6 depicts BTEX hydrographs for selected wells; the baseline (May 2000) groundwater elevation at sparge well SP-2 is anomalous when compared to other wells. Water table elevation during system operation has not been assessed.
- Denitrifying anaerobic biological processes appear to be degrading the BTEX during remediation. Prior to remediation, sulfate reduction was the process that contributed to most of the BTEX degradation.
- Water temperature is generally higher in the area of the plume than in the background area.

FIGURE 1-6 (Page 1 of 4) Harrison Subresidency

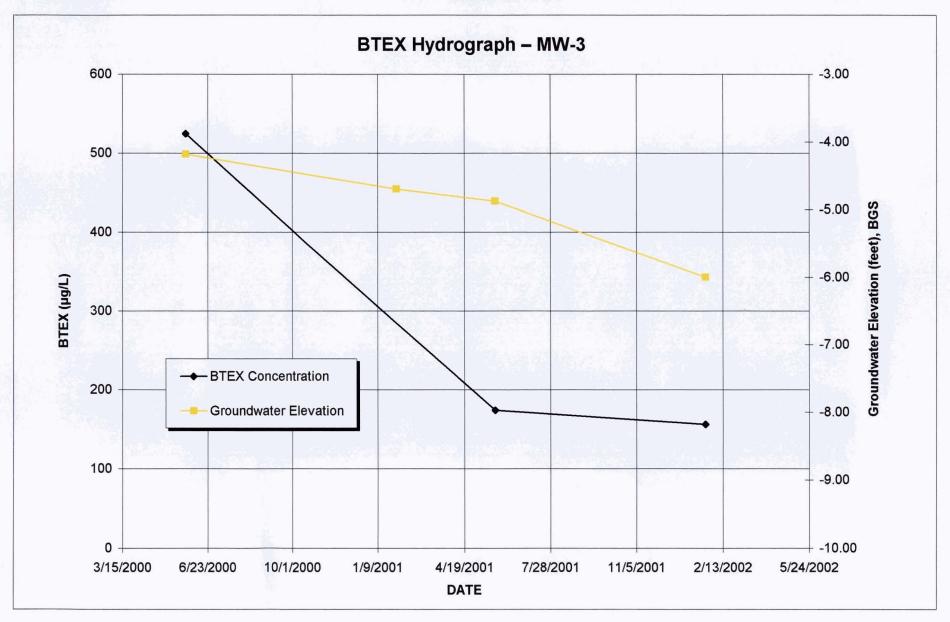
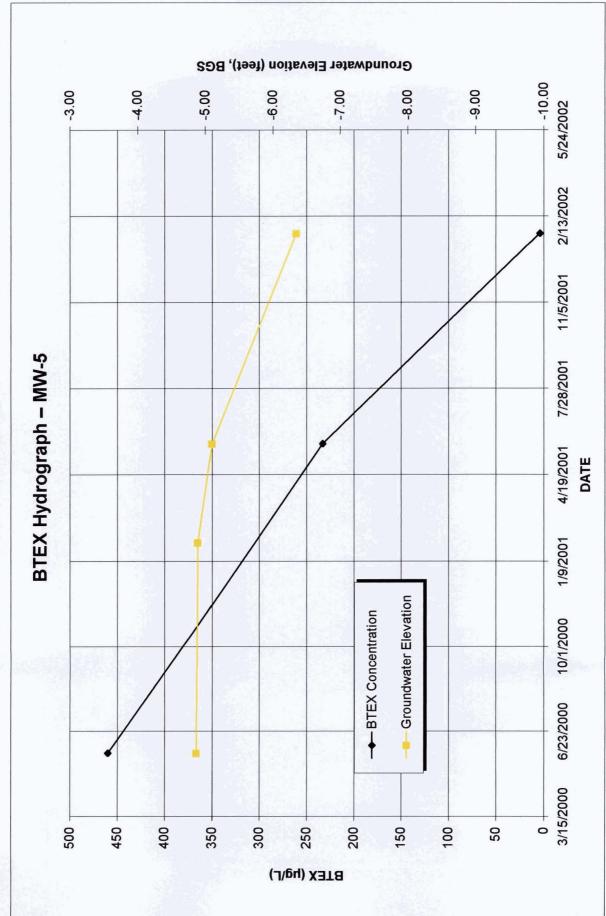


FIGURE 1-6 (Page 2 of 4) Harrison Subresidency



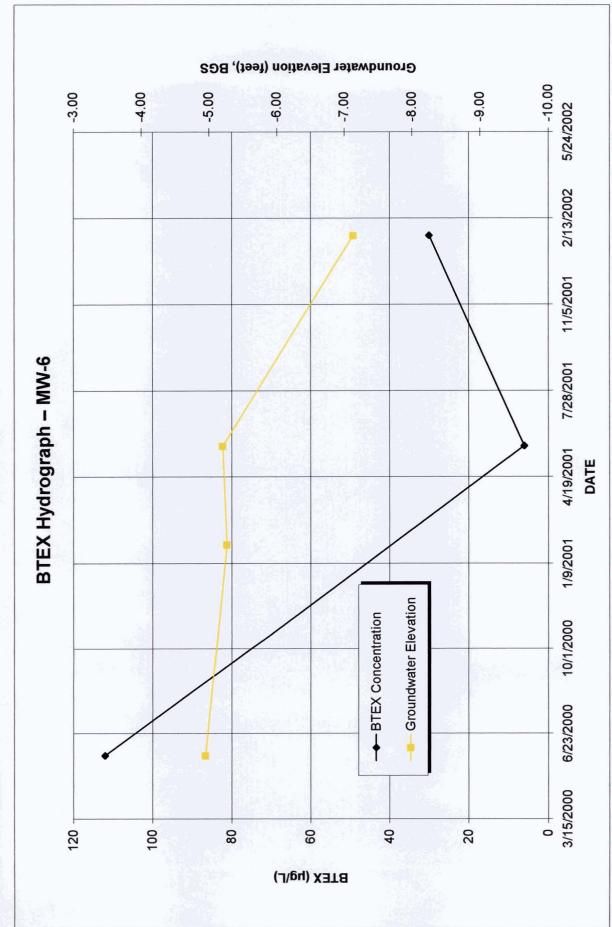
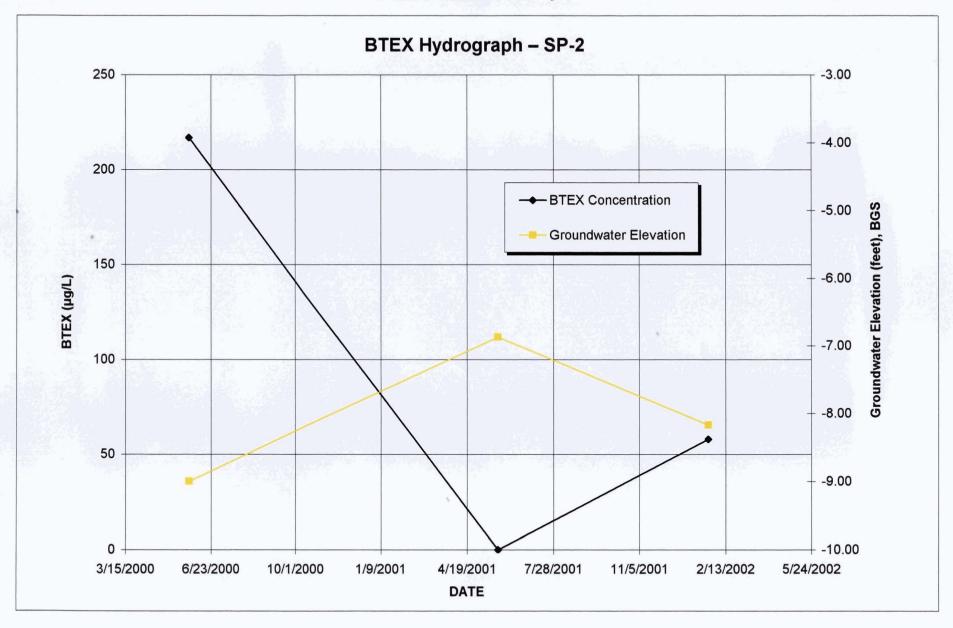


FIGURE 1-6 (Page 4 of 4) Harrison Subresidency



### 1.7 RECOMMENDATIONS

- Continued operation of the AS/SVE system is warranted until the beginning of August 2002. Thereafter, the air sparge should remain off-line until at least late October 2002 (11 weeks minimum), when the fourth round of sampling is scheduled to be performed. The AS/SVE system should then continue to remain off-line until after the fourth round results have been analyzed. If these results are as promising as the second and third round results, then the system should remain off, and a schedule for post-remedial groundwater monitoring toward site closure would be proposed at that time.
- As discussed above, a final analysis via Method 8270 should be conducted for naphthalene and 2-methylnapthalene. If the results indicate that they are not present above the target criteria, then we will advise that NYSDOT petition to remove them from consideration as contaminants of concern at this site.
- The air sparge system is programmed to pulse the airflow into the sparge points at SP-1 and SP-2. The programming during the reporting period pulsed the wells daily with 16 hours of air flow on and 8 hours off. Sparge point SP-3 must remain programmed to run continuously due to problems with the construction of the well. Sparge point SP-4 is not operational. The system should continue to operate with these settings. Due to the reduced concentrations of contaminants now present in the groundwater, an attempt should be made to increase the flow rates at SP-1 and SP-2.
- No additional sparging wells are recommended at this time.
- Overall indications seem to suggest that some level of biodegradation is taking place; data collection during system operation may be useful in assessing aerobic conditions.

#### CHAPTER 2

### OPERATION AND MAINTENANCE REPORT

### 2.1 MONTHLY INSPECTION

The monthly inspection checklist is shown in Table 2-1. The air sparge/SVE system was shut down from November 9, 2000 to January 29, 2002 due to performance groundwater sampling. The air sparge remained down until February 18, due to mechanical failure.

### 2.2 SYSTEM OPERATION

Table 2-2 tabulates the cumulative system run time over the past year and runtime since project inception, in November 2000 is displayed graphically. Figure 2-1 presents the operating calendar. Figure 2-2 provides the AS/SVE equipment specification, and depicts the equipment layout. The current sparge timer pulse settings are presented in Figure 2-3.

### 2.3 OPERATION REPORT

The monthly operation report is presented in Table 2-3. Figure 2-4 shows the SVE exhaust concentration over time.

### TABLE 2-1 INSPECTION REPORT SHEET Harrison Subresidency

Lawler,
Matusky
Skelly
Engineers LLP
Environmental Science & Engineering Consultants

			_			
Date:	1	/18/02 GG	1	/29/02 GG		
Weather:		30F Clear		sunny, clear		
SVE hours /time	799	99.1 @ 1525	79	99.1 @1010		
AS hours/time	521	10.1 @ 1525	52	10.1 @ 1010		
Air Sparging Flow Rate (CFM)	<u>vs</u>		<u>vs</u>		<u>vs</u>	
SP-1						
SP-3						
SP-4		_		_		
SP-2		ting.		ting.		
Air Sparging Pressure (PSI)		Not Operating		Not Operating		
SP-1		ð		õ		
SP-3		Ď		<b>5</b>		<u>-</u>
SP-4		_		_		
SP-2						
Air Sparging Blower Outlet						
SVE Velocity (ft/min)	1 -	<u>x</u>	T	-		
VE-1		not read		not read		
VE-2		not read		not read		
VE-3		not read		not read		
VE-4		not read	not read			
SVE Vacuum (In W.C.)	vs		vs		vs	
VE-1	100	17.5	100	18		
VE-2	100	15	100	15		
VE-3	100	11.5	100	11.5		
VE-4	100	13	100	13.5		
SVE Blower Inlet		42		42		
Vacuum at SVE Knockout Pot		23.5		23		
Pressure Monitoring Points (in W.C.)						
PM-1		not read	not	read (startup)		
PM-2		not read		read (startup)	1	
PM-3		not read		read (startup)		
PM-4		not read		read (startup)		
PM-5		not read	not	read (startup)		
Air Sparging Temperature (°C)	n	ot operating	n	ot operating		
SVE Exhaust Temperature (°C)		35		36		
SVE Exhaust PID Reading		Not Read		0		
Knockout Pot Water Level (in.)		0 _		0		
Date of Last AS Filter Change		2/13/2001		2/13/2001		
Date of Last SVE Filter Change		11/2/2001		11/2/2001		

VS = Valve Setting, % open (e.g., 0, 25, 50, 75, 100)

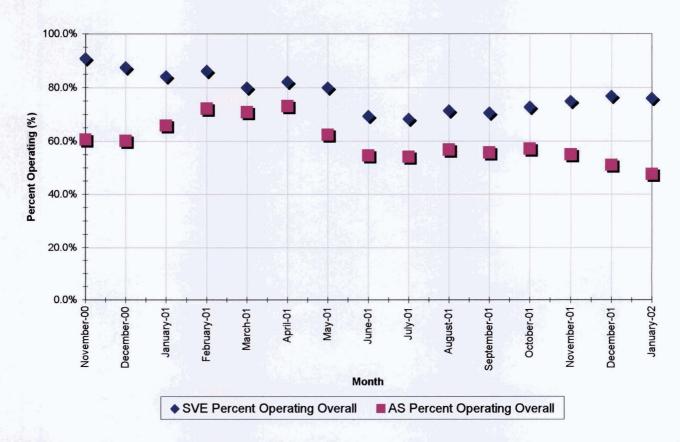
GG = George Gattullo; RD = Rob Degiorgio

Anemoter: Dwyer 471 PID: H-Nu P101, LMS#001

1/29: System start up--AS not operational.

### CUMULATIVE SYSTEM RUNTIME Harrison Subresidency

			Cumulative Hours Available	OVERALL		MONTH	
Month	SVE Cumulative Hours Running (approx.)	AS Cumulative Hours Running (approx.)		SVE Percent Operating Overall	AS Percent Operating Overall	SVE Percent Operating - Month	AS Percent Operating - Month
January-01	1,858	1,454	2,208	84.1%	65.8%	77.6%	77.2%
February-01	2,122 (a)	2,076	2,880	86.1% (b)	72.1%	92.6% (b)	92.6%
March-01	2,613	2,567	3,624	80.0%	70.8%	66.0%	66.0%
April-01	3,273	3,173	4,344	82.1%	73.0%	91.6%	84.1%
May-01	3,781	3,173	5,088	79.9%	62.4%	68.3%	0.0%
June-01	3,781	3,173	5,808	69.4%	54.6%	0.0%	0.0%
July-01	4,229	3,548	6,552	68.3%	54.2%	60.2%	50.5%
August-01	4,950	4,143	7,296	71.3%	56.8%	96.9%	79.9%
September-01	5,407	4,460	8,016	70.6%	55.6%	63.5%	44.1%
October-01	6,104	5,003	8,760	72.7%	57.1%	93.7%	73.0%
November-01	6,824	5,210	9,480	74.8%	55.0%	100.0%	28.8%
December-01	7,568	5,210	10,224	76.7%	51.0%	100.0%	0.0%
January-02	8,061	5,210	10,968	76.0%	47.5%	66.3%	0.0%



### Notes:

- (a) Due to a malfunction in the SVE elapsed timer in February, this value is not representative of the actual hours of operation.
- (b) This value is calculated using an estimated value for SVE elapsed time..

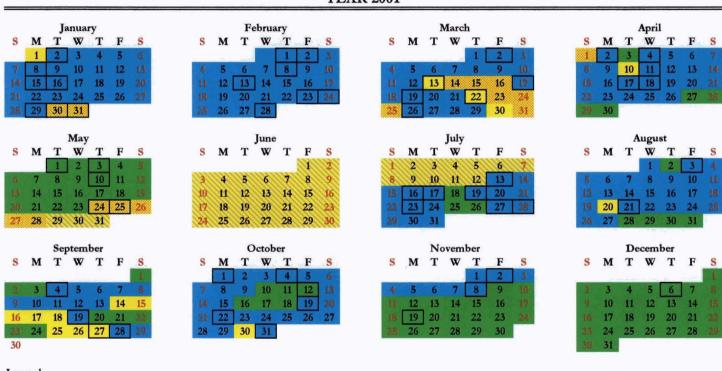
#### FIGURE 2-1 OPERATING CALENDAR

(Page 1 of 2) Harrison Subresidency

#### **YEAR 2000**

		N	oven	aber					De	cem	ber	
S	M	$\mathbf{T}$	W	T	F	S	S	M	$\mathbf{T}$	W	$\mathbf{T}$	3
			1	2	3	4						
5	6	7	8	9	10	11		4	5	6	7	-
	13	14	15	16	17		10	11	12	13	14	1
	20	21	22	23	24		17	18	19	20	21	2
	27	28	29	30				25	26	27	28	2
							31					

#### **YEAR 2001**



#### Legend

Up time
Unplanned downtime
Unplanned downtime, warranty issues
Planned downtime; quarterly sampling or maintenance
Planned or Unplanned AS system down time; SVE running
Site Visits

#### FIGURE 2-1 OPERATING CALENDAR

(Page 2 of 2) Harrison Subresidency

#### **YEAR 2002**

		T:	anua	rv					Fe	brua	ırv						N	/arcl	h						April			
S	M	T	W	T	F	S	S	M	T	W	T	F	S	8		M	T	W	Т	F	S	S	M	Т	W	T	F	S
		1	2	3	4	- 5					-	1	2	,			_			1	2		1	2	3	4	5	6
6	7	8	9	10	11	12	3	4	5	6	7	8	0	3		4	5	6	7	8	0	7	8	9	10	11	12	13
13	14	15	16	17	18	10	10	11	12	13	14	15	16	1		11	12	13	14	15	16	14	15	16	17	18	19	20
20	21	22	23	24	25	26	09	10	19	20	21	22	22			18	19	20	21	22	23	21	22	23	24	25	26	27
			000000000	000000000	43	20	2.4	25	26			44	40	2			26	1						30	4	23	20	41
27	28	29	30	31			44	45	20	27	28			2		25	20	27	28	29	30	28	29	30				
														3	I													
			May							June								July		_	_				ugus		_	-
S	M	T	W	$\mathbf{T}$	F	S	S	M	T	W	T	F	S	5		M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4							1			1	2	3	4	5	6					1	2	3
5	6	7	8	9	10	11	2	3	4	5	6	7	8	7		8	9	10	11	12	13	4	5	6	7	8	9	10
12	13	14	15	16	17	18	9	10	11	12	13	14	15	1	4	15	16	17	18	19	20	11	12	13	14	15	16	17
19	20	21	22	23	24	25	16	17	18	19	20	21	22	2	1	22	23	24	25	26	27	18	19	20	21	22	23	24
26	25	28	29	30	31		23	24	25	26	27	28	29	2	8	29	30	31				25	26	27	28	29	30	31
		Se	ptem	ber					O	ctob	er						No	vem	ber					De	cem	ber		
S	$\mathbf{M}$	T	W	T	F	S	S	$\mathbf{M}$	T	W	$\mathbf{T}$	F	S	9	,	M	T	W	T	F	S	S	$\mathbf{M}$	T	W	T	F	S
1	2	3	4	5	6	7			1	2	3	4	5							1	2	1	2	3	4	5	6	7
8	9	10	11	12	13	14	6	7	8	9	10	11	12	3	,	4	5	6	7	8	9	8	9	10	11	12	13	14
15	16	17	18	19	20	21	13	14	15	16	17	18	19	1	0	11	12	13	14	15	16	15	16	17	18	19	20	21
22	23	24	25	26	27	28	20	21	22	23	24	25	26	1		18	19	20	21	22	23	22	23	24	25	26	27	28
29	30	27	23	20	47	20	27	28	29	30	31	23	20	2		25	26	27	28	29	30	29	30	31	23	20	~/	20
29	30						41	40	29	30	31			4	+	43	20	41	40	49	30	49	30	31				

#### Legend

Up time

Unplanned downtime

Unplanned downtime, warranty issues

Planned downtime; quarterly sampling or maintenance

Planned or Unplanned AS system down time; SVE running

Site Visits

### TABLE 2-3 MONTHLY OPERATION AND MAINTENANCE REPORT

NYSDOT – HARRISON SUBRESIDENCY D012589 TOWN OF HARRISON – WESTCHESTER, NY PIN 8007.31.101	MONT	H: January 2002	
1/18/02 – LMS was on site to shutdown the SVE system in preparation for groundwater sampling. Shutdown system without incident.	a constitution of the	ENANCE THIS Med diagnosis and re	
1/23/02 – LMS was on site to perform groundwater sampling. Wells MW-1 through MW-9 sampled.	SPARE None us	PARTS USED: ed	
1/24/02 – LMS was on site to perform groundwater sampling. Wells SP-1 through SP-4 sampled.  1/29/02 – LMS was on site to restart the system. Restarted SVE, but was unable to restart AS—blower may be seized. Tightened bolts on well	None.	PARTS ORDERE	
(Note: problem was later determined to be an electrical short in the air sparge blower. The AS system was restarted on 2/18/02.)	TYPICA	AL OPERATING I	PARAMETERS:
	Air	Sparging (Total FI	ow = 0 CFM) Flow
		(psi)	(scfm)
	SP 1	Not operating	Not operating
	SP 2	Not operating	Not operating
	SP 3	Not operating	Not operating
	Vapor I	Extraction (Total FI Vacuum (inH <sub>2</sub> O)	ow = 218 CFM)
	VE 1	17.5	
	VE 2	15	
	VE 3	11.5	
	VE 4	13	
OUTSTANDING ISSUES AND ACTIONS:  • The air sparge system was inoperable at the end of this reporting month. The blower was subsequently repaired and restarted in February, 2002.	cor	us quarterly well sanducted? Yes Xes, date: Jan 23 &	K_No

#### FIGURE 2-2 AS/SVE EQUIPMENT SPECIFICATIONS AND LAYOUT

Harrison Subresidency











#### **NYSDOT HARRISON SUBRESIDENCY**

CPIN 8007.31.301 D008873

**AIR SPARGING AND SOIL VAPOR EXTRACTION** SYSTEM SPECIFICATIONS

TRAILER (Class 1, Div. 2)

Haulmark Grizzly Model #G816B2

**OVERALL** 

19'17" Length Width 100" Height 103"

**INTERIOR** 

16'4" Length Width 96" 78" Height

Platform Height 19"

Tire Size ST205/R15 15" Payload Cap. 4280 (avg.)

**Double Rear doors** 

Side door

white Color

#### AIR SPARGING SYSTEM

Blower Becker KDT Model # 3.140 HP 12

Voltage 230 V/3 phase Converter **VFD** Max. pressure 22 psig 90 scfm Max. flow Max. temp. 125 F Noise level 84 max. dBA 1 1/2 " bsp Outlet size

#### SOIL VAPOR EXTRACTION

Blower Gast Model # R6P155Q-50 HP 5.5 230 V/1 phase Voltage

Max. vacuum 85" w.c. 280 scfm Max. flow 100 F Max. temp. Noise level 81 max. dBA

Moisture sep. 60 gal.











#### FIGURE 2-3

#### AIR SPARGE WELL PULSING TIMER SETTING

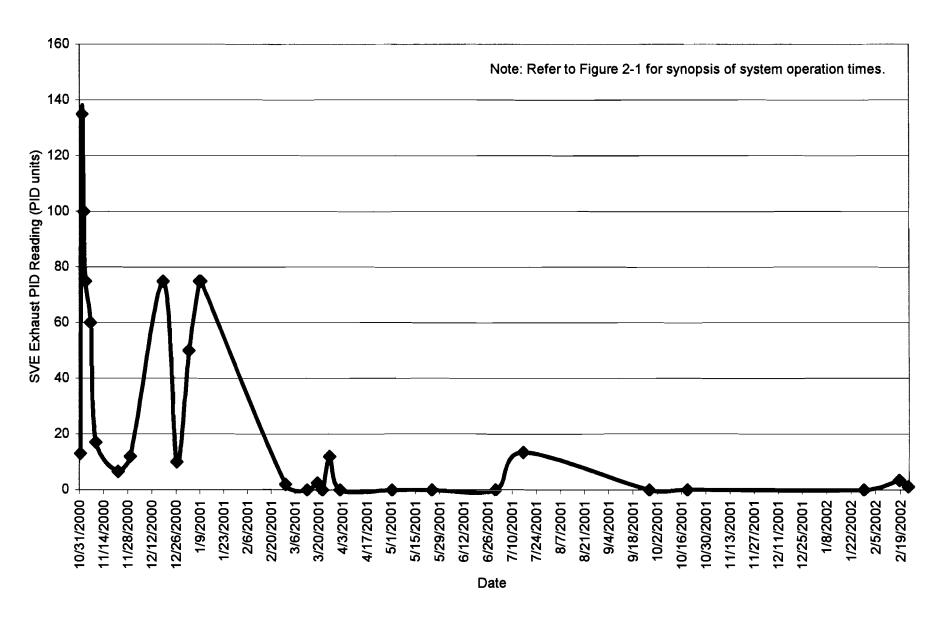
#### **NYSDOT Harrison Subresidency**

well #			Mc	nda	ıy				Ţ	ue	sda	<u>у</u>			V	/edi	nes	da	<u>у</u>			٦	hu	rsda	ay		Τ			Fri	day	,		Τ		Sat	urda	ау				S	unda	ay		٦
	12	4	8	12	4_	8	12	2 4	<u>.  </u>	8	12	4	8	12	4	8	12	4	- [8	3	12	4	8	12	4	8	12	2	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	コ
1															m?}}\$			K)									Ď,												1						+	_
3									S V																	3 44			\$																	
By-pass	(C)																		<u>.</u>																				os (Sabil							
2								-			94	erikes S			_						_						8												i ja		-					
							-									_																								-				1		
																				l														L												

LEGEND:

= sparge air on

FIGURE 2-4 SVE EXHAUST PID READINGS Harrison Subresidency



## ATTACHMENT A MONITORING WELL DATA SUMMARY

14/E1 4 PD = E04/4				91		
WELL ID: MW 1	(May 2000)	QUARTER 1 (JAN 2001)		QUARTER 3	QUARTER 4	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/l	l L)					אואנים נוגוף
MTBE	ND	54	ND			50
Benzene	ND	ND	ND			
Toluene	ND	ND	ND			
Ethylbenzene	ND	ND	ND			
m.p-Xylene	ND	ND	-			
O-Xylene	ND	ND	-			
Xylenes (total)	ND	ND	ND			
TOTAL BTEX	ND	ND	ND			100
Semi-volatile org.(ug/l	}					es.
2-Methylnaphthalene			ND ND		\ 	50 25
Napthalene			ND			25
Metals (ug/L)						
Chloride	7,000	•				250,000
Sodium	27.000	•	i •		J	20,000
Iron (total)	ND	•	207			300
Iron (dissolved)	ND		ND			300
Lead	ND	•	•			25
Other (ug/L)						
Nitrogen, Nitrate	4,100	•	11,000			10,000
Sulfate	15,000	<b> </b>	13,000			250,000
TOC	4,000	•	9,000			NVA
Petroleum Hydrocarbon	•	•	· •			N/A
Carbon Dioxide	97,400	•	59,000			NVA
Dissolved Oxygen	3.6	1.97	6.42			NVA

MELL ID. ERALO		********	20		Corsenant a	****
WELL ID: MW 2		(JAN 2001)	QUARTER 2	QUARIERS	QUARTER 4	TARGET EFFLUENT CRITERIA
Volatile Organics (ug	(L)			ĺ		
MTBE	5.5	15	ND			50
Benzene	2.1	ND	ND			
Toluene	8.0	2	ND			*
Ethylbenzene	2.7	ND	ND			4
m.p-Xylene	ND	-				4
O-Xylene	3.8	_	-			******
Xylenes (total)	3.8	2	ND			4
TOTAL BTEX	16.6	4	ND			100
Semi-volatile org.(ug/	] 1)					
2-Methylnaphthalene	ĺ		ND			50
Napthalene			ND			25
Metals (ug/L)						
Chloride	10,000	•	•			250,000
Sodium	22,000	•	•			20,000
Iron (total)	· ·	•	6330			300
Iron (dissolved)	•	•	646			300
Lead	•	•	•			25
Other (ug/L)						
Nitrogen, Nitrate	<b>•</b>	•	ND			10,000
Sulfate	•	•	14,000			250,000
TOC	•	•	17,000			N/A
Petroleum Hydrocarbo	n	•	•			NVA
Carbon Dioxide	•	•	49,000	ĺ		NVA
Dissolved Oxygen	2.6	3.08	4.23			NVA

#### ATTACHMENT A (Page 2 of 8)

MET LID. BOARD				01	Accepted	*****
WELL ID: MW 3	(May 2000)	QUARTER I (JAN 2001)	QUARIER 2	QUARTER 3	QUARIERA	TARGET EFFLUEN CRITERIA
Volatile Organics (ug/l	L)					UNI. 2310-
MTBE	50	21	ND			50
Benzene	64	ND	2			
Toluene	21	ND	2			
Ethylbenzene	350	ND	ND			4
m,p-Xylene	460	-	_			
O-Xylene	65	-	-			4
Xylenes (total)	525	2	170		ĺ	: : : : : : : : : : : : : : : : : : :
TOTAL BTEX	960.0	2.0	174			100
Semi-volatile org.(ug/l	  }					
2-Methylnaphthalene	ĺ		ND			50
Napthalene	160		4 J			25
Metals (ug/L)						
Chloride	24,000	•	•			250,000
Sodium	43,000	•				20,000
Iron (total)	18,000	•	8880			300
Iron (dissolved)	ND	•	2410			300
Lead	8	•	•			25
Other (ug/L)						
Nitrogen, Nitrate	ND	•	ND			10,000
Sulfate	ND	•	18,000			250,000
TOC	10,000	•	27,000			NVA
Petroleum Hydrocarbon		•	•			NVA
Carbon Dioxide	105,000	•	48,000	ĺ		NVA
Dissolved Oxygen	2.1	2.93	1.89			NVA

WELL ID: MW 4		OCIADAMA		<b>6</b> 1	QUARTER 4	TARGET
WELL ID: MW 4		QUARTER 1 (JAN 2001)	QUARIERZ	QUARIER 3	QUARIER 4	EFFLUENT CRITERIA
Volatile Organics (ug/	l L)					VNISERVA
MTBE	ľ 13 .	3	ND			50
Benzene	4.4	ND	ND			
Toluene	ND	ND	ND			
Ethylbenzene	22	2	2			
m,p-Xylene	•	•	-			
O-Xylene	<b>1</b> •	•	_			1
Xylenes (total)	13	ND	1			4
TOTAL BTEX	39.4	2.0	2			100
Semi-volatile org.(ug/l 2-Methylnaphthalene Napthalene	  ) 		ND ND			50 25
Metals (ug/L)						
Chloride	8,000	•	<b>•</b>			250,000
Sodium	22,000	•	<b>•</b>			20,900
iron (total)	•	•	1360			30D
Iron (dissolved)	•	•	1010			300
Lead	•	•	•			25
Other (ug/L)						
Nitrogen, Nitrate	•	•	ND			10,000
Sulfate	•	•	15,000			250,000
TOC	•	•	14,000			NVA
Petroleum Hydrocarbon	•	•	•			NVA
Carbon Dioxide	•	•	55,000			NA
Dissolved Oxygen	3.5	2.35	4.29			NA

#### ATTACHMENT A (Page 3 of 8)

			· · · · · · · · · · · · · · · · · · ·	61		
WELL ID: MW 5	BASELINE (May 2000)	QUARTER 1 (JAN 2001)	QUARTER 2	QUARTER 3	QUARTER 4	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/l	_)					CRIDENIA
MTBE	150	ND	ND			50
Benzene	14	ND	1 1			
Toluene	32	2	2			
Ethylbenzene	410	ND	ND			
m,p-Xylene	•	•	-		ļ ļ	
O-Xylene	•	•	-			
Xylenes (total)	460	43	230			
TOTAL BTEX	916.0	45.0	233			100
Semi-volatile org.(ug/l	)					
2-Methylnaphthalene	ĺ		10			50
Napthalene			ND			25
Metals (ug/L)						
Chloride	60.000		<b>I</b> •			250,000
Sodium	32,000					20,000
Iron (total)	<b>*</b>	· •	9630			300
Iron (dissolved)	•	<b>.</b>	2930			300
Lead	<b>*</b>	•	•			25
Other (ug/L)						
Nitrogen, Nitrate	•	•	ND			10,000
Sulfate	•	•	17,000			250,000
TOC	•	•	23,000			NA
Petroleum Hydrocarbon	•	•	•			NA
Carbon Dioxide	•	•	68,000			NA
Dissolved Oxygen	3.4	3.09	6.12			NVA

				101		
WELL ID: MW 6		QUARTER 1 (JAN 2001)	QUARTER 2	QUARTER 3	QUARTER 4	TARGET EFFLUENT CRITERIA
  Volatile Organics (ug/l	L)					QINI3 EINIM
MTBE	73	20	ND			50
Benzene	7.9	ND	ND			<b></b>
Toluene	7	ND	ND			
Ethylbenzene	98	ND	ND			
m,p-Xylene	•	•	_			
O-Xylene	•	•	-			
Xylenes (total)	112	21	6			4
TOTAL BTEX	224.9	21	6			100
Semi-volatile org.(ug/l	 }					
2-Methylnaphthalene	ĺ		ND ND			50
Napthalene			ND			25
Metals (ug/L)						
Chloride	40.000	•	•			250,000
Sodium	33,000	•	<b> </b>			20,000
Iron (total)	•	•	1720			300
Iron (dissolved)	•	•	475			300
Lead	•	•	•			25
Other (ug/L)						
Nitrogen, Nitrate	•	<b>+</b>	ND			10,000
Sulfate	•	•	17,000			250,000
TOC	•	•	17,000			N/A
Petroleum Hydrocarbon	•	•	•			WA
Carbon Dioxide	•	•	60,000			NVA
Dissolved Oxygen	3.1	6.05	4.1			NVA

#### ATTACHMENT A (Page 4 of 8)

WELL ID: MW 7	BASELINE (May 2000)	*****************		01 QUARTER 3	QUARTER 4	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/l	<u></u>					
MTBE	16	38	17			50
Benzene	3.4	ND	ND			
Toluene	4	ND	ND			
Ethylbenzene	5.7	ND	ND			
m.p-Xylene	•	•	-			
O-Xylene	•	•	-		1	
Xylenes (total)	4.8	ND	ND			
TOTAL BTEX	17.9	ND	0			100
Cami calatila ana tand	Į					
Semi-volatile org.(ug/l	<i>!</i>		ND			50
2-Methylnaphthalene			ND ND			26
Napthalene			שא			20
Metals (ug/L)				]		
Chloride	40,000	•	•			250,000
Sodium	35,000	•	•			20,000
Iron (total)		•	2700			300
Iron (dissolved)	•	•	1880			300
Lead	•	<b>*</b>	•			25
Other (ug/L)						
Nitrogen, Nitrate		•	ND			10.000
Sulfate	•	l •	15.000			250.000
TOC	· •	· •	16,000			NVA
Petroleum Hydrocarbon		•				NA
Carbon Dioxide	•	i .	78,000			NA
Dissolved Oxygen	3.2	3.12	4.43			N/A

			. ' . ' . ' . ' . ' . ' . ' . ' . ' . '	<b>0</b> 1		
WELL ID: MW 8	(May 2000)	QUARTER 1 (JAN 2001)	QUARTER 2	QUARTER 3	QUARTER 4	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/	! L)					7,00
MTBE	68	6	ND			50
Benzene	110	ND	ND			
Toluene	26	ND	2			
Ethylbenzene	60	ND	ND			
m,p-Xylene	160	ND	-			
O-Xylene	40	ND	-			4
Xylenes (total)	200	ND	34			
TOTAL BTEX	396.0	ND	36			100
Semi-volatile org.(ug/l	 					
2-Methylnaphthalene	ĺ		ND ND			50
Napthalene	34		ND			25
Metals (ug/L)						
Chloride	5.000	l •	•			250,000
Sodium	63,000	•	<b> </b>			20,000
Iron (total)	8,600	l •	545			300
Iron (dissolved)	230	•	ND			300
Lead	ND	•	•			25
Other (ug/L)						
Nitrogen, Nitrate	33	•	ND			10,000
Sulfate	ND	•	31,000			250,000
TOC	12,000	•	21,000			N/A
Petroleum Hydrocarbon	7,600	•	•			N/A
Carbon Dioxide	264,000	•	37,000			N/A
Dissolved Oxygen	1.5	6.3	4.6	}		NA

#### ATTACHMENT A (Page 5 of 8)

MELL ID. SPACE						
WELL ID: MW 9	BASELINE (May 2000)	QUARTER 3 (JAN 2001)	QUARTER 2	QUARTER 3	QUARTER 4	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/l	_)					CRI) END
MTBE	ND	ND	ND			50
Benzene	ND	ND	ND			•
Toluene	ND	ND	ND			4
Ethylbenzene	ND	ND	ND			
m.p-Xylene	•	•	-			
O-Xylene	•	•	-			
Xylenes (total)	ND	ND	ND			
TOTAL BTEX	ND	ND	0			100
Semi-volatile org.(ug/l						
2-Methylnaphthalene	ĺ		2 J			50
Napthalene			ND			25
Metals (ug/L)						
Chloride	260,000	•	•			250,000
Sodium	160,000					20.000
Iron (total)	•	•	4570			300
Iron (dissolved)	•		ND			300
Lead	•	•	•			25
Other (ug/L)						
Nitrogen, Nitrate	•	•	ND			19,000
Sulfate	•	•	21,000			250,000
TOC	•	•	18,000			NVA
Petroleum Hydrocarbon	•	•	•			NA
Carbon Dioxide	•	•	ND		[	N/A
Dissolved Oxygen	3.3	7.5	5.49			N/A

WELL ID: PC 1	BASELINE (May 2000)	QUARTER 1 (JAN 2001)	QUARTER 2	QUARTER 3	QUARTER 4	TARGET EFFLUENI CRITERIA
Volatile Organics (ug/l	L)					AMISERUM
MTBE	ND	ND	NA NA			50
Benzene	ND	ND	NA NA			4
Toluene	ND	ND	NA NA			•
Ethylbenzene	ND	ND	NA NA			
m.p-Xylene	ND	ND	NA NA			
O-Xylene	ND	ND	NA NA			
Xylenes (total)	ND	ND	NA NA			4
TOTAL BTEX	ND	ND	NA			100
Semi-volatile org.(ug/l	) }					
2-Methylnaphthalene	<b>′</b>		l na			50
Napthalene			NA NA		}	25
Metals (ug/L)						
Chloride	34.000	•	l NA			250,000
Sodium	120,000	•	NA.			20,000
Iron (total)	17,000	•	NA NA			300
Iron (dissolved)	ND	•	NA NA			300
Lead	7	•	NA NA			25
Other (ug/L)						
Nitrogen, Nitrate	ND	•	NA NA			10,000
Sulfate	23,000	•	NA NA			250,000
TOC	13,000	•	NA NA			NVA
Petroleum Hydrocarbon	•	•	NA NA			N/A
Carbon Dioxide	67,000	•	NA NA			N/A
Dissolved Oxygen	2.4	4.11	NA NA			N/A

#### ATTACHMENT A (Page 6 of 8)

				61		
WELL ID: SP 1		QUARTER 1 (JAN 2001)	QUARTER 2	QUARTER 3	QUARTER 4	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/	! L)					URISERIA
MTBE	Ī 3.2	31	ND			50
Benzene	1.4	ND	ND			
Toluene	3.7	ND	ND		ļ l	1
Ethylbenzene	4.0	ND	ND			
m.p-Xylene	8.1	-	_			
O-Xylene	2.9	-	_			
Xylenes (total)	11.0	ND	ND ND			
TOTAL BTEX	31.1	ND	ND			100
Semi-volatile org.(ug/l	<u> </u>					
2-Methylnaphthalene	1					50
Napthalene			i			25
BE-4-1- (						
Metals (ug/L)	40,000	_				***
Chloride	16,000	•	l •			250,000
Sodium	45,000	•	•			20,000
Iron (total)	<b>!</b> •	*				300
Iron (dissolved)	<b> </b> •	•				300
Lead	·	•	•			25
Other (ug/L)						
Nitrogen, Nitrate	<b>                                     </b>	•	•			19,000
Sulfate	•	•	•			250,000
TOC	•	•	<b>!</b> ◆			NVA
Petroleum Hydrocarbon	•	•	<b> </b> •			N/A.
Carbon Dioxide	•	•	<b> </b> •			N/A
Dissolved Oxygen	4.6	9.66	4.6			N/A

WELL ID: SP 1B	BASELINE	OUARTER 1		01 OHARTER 2	QUARTER 4	TARGET
WEEE 15. 01 15	(May 2000)		XV7\\\_\\			EFFLUENT
Volatile Organics (ug/l	! L)					CRITERIA
MTBE	4.9	•	ND			50
Benzene	2.1	•	ND			*
Toluene	ND	•	ND			
Ethylbenzene	ND	•	ND			
m.p-Xylene	3.5	•				
O-Xylene	5.6	•	_			
Xylenes (total)	9.1	•	ND			
TOTAL BTEX	20.3	•	ND			100
Semi-volatile org.(ug/l	l `					
2-Methylnaphthalene	í		l 🗼			50
Napthalene						25
Mapulaierie			'			
Metals (ug/L)					l i	
Chloride	34.000	•	<b>l</b> •			250.000
Sodium	27,000	•				20,000
Iron (total)	•	•				300
Iron (dissolved)	•	•				300
Lead	•	•	•			25
Other (ug/L)						
Nitrogen, Nitrate	•	•	I •			10,000
Sulfate	•	•	•			250,000
TOC	•	•	•			NVA
Petroleum Hydrocarbon	•	•	•			NVA
Carbon Dioxide	•	•	•			N/A.
Dissolved Oxygen	4.7		4.91			NVA

#### ATTACHMENT A (Page 7 of 8)

WELL ID: SP 2	F44F2440F	ACIANTER &	ALCONTED A	TARGET		
WELL ID: SP 2		QUARTER 1 (JAN 2001)	QUAKTEKZ	QUARTERS	QUARTER 4	EFFLUEN CRITERIA
Volatile Organics (ug/	L)					CRISERIA
MTBE	ľ 18	<b>I</b> •	14			50
Benzene	19	•	ND			4
Toluene	25	•	ND			
Ethylbenzene	110	•	ND			4
m,p-Xylene	52	•	-			
O-Xylene	11	•	-		Ì	
Xylenes (total)	63	•	ND			
TOTAL BTEX	217.0	•	0.0			100
Semi-volatile org.(ug/l	) }	}	ļ			
2-Methylnaphthalene	ĺ					50
Napthalene			1			25
Metals (ug/L)						
Chloride	36,000	I •		ĺ		250.000
Sodium	75,000					20.000
Iron (total)	•	i .				300
Iron (dissolved)	l •	•	ŀ			300
Lead	•	•	•			25
Other (ug/L)						
Nitrogen, Nitrate	•	l •	<b>I</b> •			10,000
Sulfate	•	<b> </b>	<b> </b>			250,000
TOC	l •	l •	l •			NVA
Petroleum Hydrocarbon	•	•	<b> </b>			NVA
Carbon Dioxide	•	•	•			N/A
Dissolved Oxygen	2.5	l •	3.1			N/A

			20	01			
WELL ID: SP 3	BASELINE (May 2000)		QUARTER 2	QUARTER 3	QUARTER 4	TARGET EFFLUENT	
Volatile Organics (ug/l	l L)	ļ				CRITERIA	
MTBE	Ī 38	•	7			50	
Benzene	110	•	ND				
Toluene	39	•	ND				
Ethylbenzene	200	•	ND				
m,p-Xylene	180	•	-				
O-Xylene	57	•	-				
Xylenes (total)	237	•	15				
TOTAL BTEX	586.0	•	15.0			100	
Semi-volatile org.(ug/l	 )						
2-Methylnaphthalene			<b>+</b>			50	
Napthalene			1			25	
Metals (ug/L)							
Chloride	6,000	•	•			250,000	
Sodium	38,000	•	•			20,000	
Iron (total)	•	•	<b>+</b>			300	
Iron (dissolved)	•	•	•			300	
Lead	•	•	•			25	
Other (ug/L)							
Nitrogen, Nitrate	<b> </b> •	•	•			10,000	
Sulfate	•	•	<b>•</b>			250,000	
TOC	<b>•</b>	•	<b>•</b>			N/A	
Petroleum Hydrocarbon	•	•	<b>•</b>			N/A	
Carbon Dioxide	•	•	<b>)</b> •			N/A	
Dissolved Oxygen	3.4	•	4.21			NA	

#### ATTACHMENT A (Page 8 of 8)

#### MONITORING WELL DATA SUMMARY MAY 2000 (BASELINE DATA)

Harrison Subresidency

			2061							
WELL ID: SP 4		QUARTER 1 (JAN 2001)	QUARTER 2	QUARTER 3	QUARTER 4	TARGET EFFLUENT CRITERIA				
Volatile Organics (ug/	L)					CRISERIA				
MTBE	24	•	ND			50				
Benzene	24	•	ND							
Toluene	3.8	•	ND		·					
Ethylbenzene	35	•	ND			4				
m,p-Xylene	9.5	•	_							
O-Xylene	2.4	•	_							
Xylenes (total)	11.9	•	ND							
TOTAL BTEX	74.7	•	0.0			100				
Semi-volatile org.(ug/	  }									
2-Methylnaphthalene	Ϊ	I •				50				
Napthalene		<b>,</b>	i			25				
Metals (ug/L)										
Chloride	16,000		l •			250,000				
Sodium	24,000	i .	1			20,000				
Iron (total)	_ i,eee		l •			300				
Iron (dissolved)	•		l • •			300				
Lead	•	•	•			25				
Other (ug/L)										
Nitrogen, Nitrate	l •	•	l •			18,000				
Sulfate	I .	l •	I •			250,000				
TOC	I •	•	•			NVA				
Petroleum Hydrocarboi	1	•	<b>I</b>			N/A				
Carbon Dioxide		•	l •			N/A				
Dissolved Oxygen	4.2	•	6.89			N/A				

Not analyzed.

NA - Not available and/or not analyzed.

N/A - not applicable.

ND - Not detected at analytical reporting limit.

Note - Numbers in bold exceed Target Effluent Criterion.

- indicates included in Total, i.e. Total xylenes.

J - estimated concentration; compound present below quantitation limit.

# ATTACHMENT B WELL SAMPLING LOGS

### LMS Well Sampling Log

Well ID No.: MW-1

Well Casing Type: 4" PVC

Start SWL: 4.49

Project: Harrison SVE 446-311

Well Depth\*\*: 8.58

Water Column Ht.: 4.09

**Date:** 1/23/02

Screened Interval: N/A

Well Casing Volume (gallons): 2.67/8

Crew: TMS/MP

Well Elevation\*\*: N/A

**SWL During Sampling: 4.57** 

Purge Method: Submersible Pump

Ground Elevation: N/A

Sample Time: 1520

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

Well Condition: Fair

Sample Method: Bailer

**PID Head Space (ppm):** 0.0 - 0.1

Weather Conditions: Cloudy, 45 degrees.

Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

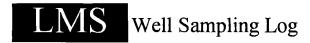
and 4500-CO2D

Time	Est. Gal. Purged	Purge Rate (gpm)	рН	Cond.	Turbidity (NTU)	D.O. (mg/L)	Temp. (C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
	0	0.5	8.50	240	3	8.5	9.0	0.1	150		
	4	0.5	7.50	281	3	8.3	8.8	0.1	165		
	8	0.5	8.50	239	56	8.1	8.9	0.1	145		
	Sampling		8.20	234	14	8.3	8.9	0.1	80		
			_								
	-			_							
			_								
										_	
C			:- A - 3 * 3								

Comments:

Water is turbid.

<sup>\* -</sup> Measurement taken from top of well casing



Well Casing Type: 4" PVC

Start SWL: 6.00

Project: Harrison SVE 446-311

Well Depth\*\*: 10.29

Water Column Ht.: 4.29

**Date:** 1/23/02

Screened Interval: N/A

Well Casing Volume (gallons): 2.8/8.5

Crew: TMS/MP

Well Elevation\*\*: N/A

SWL During Sampling: 5.61

Purge Method: Submersible Pump

Ground Elevation: N/A

Sample Time: 1540

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

Well Condition: Fair

Sample Method: Bailer

**PID Head Space (ppm):** 0.0 - 0.1

Weather Conditions: Cloudy, 45 degrees.

Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

and 4500-CO2D

Time	Est. Gal. Purged	Purge Rate (gpm)	рН	Cond.	Turbidity (NTU)	D.O. (mg/L)	Temp. (C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
	0	0.5	7.80	602	178	3.3	10.3	0.3	-65		Dry at 5 gallons - restart - dry at 7 gallons
	10_	0.5	7.50	647	151	4.4	11.7	0.3	-55		Restart
	Sampling	0.5	7.60	687	180	3.6	10.8	0.3	-60		
		•				_					
									_		
							_				
	_		_			_					
										_	
		_							_	_	
			_								
Comments			ic turbid								

Comments:

Water is turbid.

<sup>\* -</sup> Measurement taken from top of well casing

### Well Sampling Log

Well ID No.: MW-3

Well Casing Type: 4" PVC

Start SWL: 6.00

Project: Harrison SVE 446-311

Well Depth\*\*: 10.75

Water Column Ht.: 4.75

**Date: 1/23/02** 

Screened Interval: N/A

Well Casing Volume (gallons): 3.1/9.5

Crew: TMS/MP

Well Elevation\*\*: N/A

SWL During Sampling: 6.1

Purge Method: Submersible Pump

Ground Elevation: N/A

Sample Time: 1600

Well Condition: Fair

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

Sample Method: Bailer

PID Head Space (ppm): 0.3-0.9

Weather Conditions: Cloudy, 45 degrees.

Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

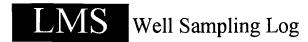
and 4500-CO2D

Time	Est. Gal. Purged	Purge Rate (gpm)		Cond.	Turbidity (NTU)	D.O. (mg/L)	Temp. (C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
	0	0.5	7.50	751	547	2.2	12.3	0.4	-100		Odor
	13	0.5	7.60	749	224	3.4	12.8	0.4	-95		Odor
	Sampling	0.5	7.30	739	164	3	12.1	0.4	-80		Odor
							_				
				_							
										_	
						_				ļ	
				ļ							
							_				
							_				
							_				
							_				
							_				
				_							1921
Comments		TY7 /	is turbid	_							

Comments:

Water is turbid.

<sup>\* -</sup> Measurement taken from top of well casing



Well Casing Type: 4" PVC

Start SWL: 5.98

Project: Harrison SVE 446-311

Well Depth\*\*: 11.62

Water Column Ht.: 5.64

Date: 1/23/02

Screened Interval: N/A

Well Casing Volume (gallons): 3.68/11

Crew: TMS/MP

Well Elevation\*\*: N/A

**SWL During Sampling:** 5.9

Purge Method: Submersible Pump

Ground Elevation: N/A

Sample Time: 1615

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

Well Condition: Fair

Sample Method: Bailer

PID Head Space (ppm): 0.0 - 0.1

Weather Conditions: Cloudy, 45 degrees.

Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

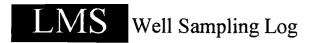
and 4500-CO2D

Time	Est. Gal. Purged	Purge Rate (gpm)	pН	Cond.	Turbidity (NTU)	D.O. (mg/L)	Temp. (C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
	0	0.5	7.50	850	254	4.1	12.2	0.1	105		
	10	0.5	7.60	260	252	3.2	12.3	0.1	105		
	15	0.5	7.50	626	254	5.7	12.7	0.1	95		
_	Sampling		7.80	262	19	3.9	11.8	0.1	25		
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Comments			أعلىا								

Comments:

Water is turbid.

<sup>\* -</sup> Measurement taken from top of well casing



Well Casing Type: 4" PVC

Start SWL: 6.35

Project: Harrison SVE 446-311

Well Depth\*\*: 11

Water Column Ht.: 4.65

**Date:** 1/23/02

Screened Interval: N/A

Well Casing Volume (gallons): 3.04/9.1

Crew: TMS/MP

Well Elevation\*\*: N/A

SWL During Sampling: 6.43

Purge Method: Submersible Pump

Ground Elevation: N/A

Sample Time: 1625

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

Well Condition: Fair

Sample Method: Bailer

PID Head Space (ppm): 0.0 - 0.1

Weather Conditions: Cloudy, 45 degrees.

Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

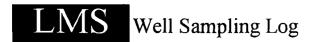
and 4500-CO2D

Time	Est. Gal. Purged	Purge Rate (gpm)	pН	Cond.	Turbidity (NTU)	D.O. (mg/L)	Temp. (C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
	0	0.5	7.80	151	114	9.2	8.6	0.1	-90		
	10	0.5	7.80	219	55	8.7	8.8	0.1	-35		
	Sampling	0.5	7.80	172	32	9	10.1	0.1	-25		
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										_	
Comments											

Comments:

Water is turbid.

<sup>\* -</sup> Measurement taken from top of well casing



Well Casing Type: 4" PVC

Start SWL: 7.13

Project: Harrison SVE 446-311

Well Depth\*\*: 14.77

Water Column Ht.: 7.64

**Date:** 1/23/02

Screened Interval: N/A

Well Casing Volume (gallons): 5.0/15.0

Crew: TMS/MP

Well Elevation\*\*: N/A

**SWL During Sampling:** 7.25

Purge Method: Submersible Pump

Ground Elevation: N/A

Sample Time: 1700

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

Well Condition: Fair

Sample Method: Bailer

PID Head Space (ppm): 100-376

Weather Conditions: Cloudy, 45 degrees.

Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

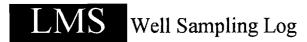
and 4500-CO2D

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Stong Odor

Comments:

Water is turbid.

<sup>\* -</sup> Measurement taken from top of well casing



Well Casing Type: 4" PVC

Start SWL: 6.97

Project: Harrison SVE 446-311

Well Depth\*\*: 14.67

Water Column Ht.: 7.7

**Date: 1/23/02** 

Screened Interval: N/A

Well Casing Volume (gallons): 5.0/15.0

Crew: TMS/MP

Well Elevation\*\*: N/A

**SWL During Sampling: 5.92** 

Purge Method: Submersible Pump

Ground Elevation: N/A

Sample Time: 1645

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

Well Condition: Fair

Sample Method: Bailer

PID Head Space (ppm): 0.0 - 0.2

Weather Conditions: Cloudy, 45 degrees.

Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

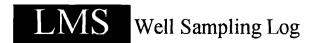
and 4500-CO2D

Time	Est. Gal. Purged	Purge Rate (gpm)	pН	Cond.	Turbidity (NTU)	D.O. (mg/L)	Temp. (C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
	0	0.5	7.60	525	72	2.6	12.6	0.3	-75		
	17	0.5	7.30	529	170	4.5	11.9	0.3	-60		
	20	0.5	7.30	540	104	2.3	12.6	0.3	-60		
	Sampling	0.5	7.50	532	98	3.4	12.2	0.3	-30		
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Comments:

Water is turbid.

<sup>\* -</sup> Measurement taken from top of well casing



Well Casing Type: 2" PVC Si

Start SWL: 8.43

Project: Harrison SVE 446-311

Well Depth\*\*: 13.74

Water Column Ht.: 5.31

**Date: 1/23/02** 

Screened Interval: N/A

Well Casing Volume (gallons): 1.1/3.5

Crew: TMS/MP

Well Elevation\*\*: N/A

**SWL During Sampling: 8.4** 

Purge Method: Submersible Pump

Ground Elevation: N/A

Sample Time: 1725

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

Well Condition: Fair

Sample Method: Bailer

PID Head Space (ppm): 0.0 - 0.1

Weather Conditions: Cloudy, 45 degrees.

Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

and 4500-CO2D

Time	Est. Gal. Purged	Purge Rate (gpm)	pН	Cond.	Turbidity (NTU)	D.O. (mg/L)	Temp. (C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
	0	0.5	8.50	434	43	11.1	11.2	0.2	25		
	5	0.5	8.50	445	18	10.7	11.5	0.2	25		
	Sampling		8.40	442	71	12.3	10.9	0.2	25		
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Comments:

Water is turbid.

<sup>\* -</sup> Measurement taken from top of well casing

LMS Well Sampling Log

Well ID No.: PC-1

Well Casing Type: 2" PVC Pezometer

Start SWL: WELL DRY

**Project:** Harrison SVE 446-311

Well Depth\*\*: 6.87

Water Column Ht.: N/A

**Date:** 01/23/2002, 1/24/02

Screened Interval: N/A

Well Casing Volume (gallons): N/A

Crew: TMS/MP

Well Elevation\*\*: N/A

SWL During Sampling: N/A

Purge Method: WELL DRY

Ground Elevation: N/A

Sample Time: N/A

Meters Used: N/A

Well Condition: Fair

Sample Method: N/A

PID Head Space (ppm): 0.0 - 0.1, 0.0-0.1

Weather Conditions: Cloudy, 45 degrees.

Sample Analyses: No Samples Collected - Well is dry.

Time	Est. Gal. Purged	Purge Rate (gpm)	рĦ	Cond.	Turbidity (NTU)	D.O. (mg/L)		Salinity (%)	ORP (mV)		Comments
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omments		1	DDI/ N/	2 (1 4 ) (12)	ES COLLE	OTTEN					

Comments:

WELL DRY - NO SAMPLES COLLECTED

<sup>\* -</sup> Measurement taken from top of well casing

LMS Well Sampling Log

Well ID No.: SP-1

Well Casing Type: 1.5" PVC

Start SWL: 5.60

Project: Harrison SVE 446-311

Well Depth\*\*: 19.18

Water Column Ht.: 13.58

**Date:** 1/24/01

Screened Interval: N/A

Well Casing Volume (gallons): 1.25/4

Crew: TMP/ET

Well Elevation\*\*: N/A

SWL During Sampling: 5.67

Purge Method: Bailer

Ground Elevation: N/A

Sample Time: 1215

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

Well Condition: Fair

Sample Method: Bailer

PID Head Space (ppm): 0.1

Weather Conditions: Rain/Drizzle, 40 degrees.

Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

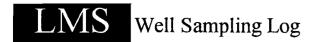
and 4500-CO2D

Time	Est. Gal. Purged	Purge Rate (gpm)	рН	Cond.	Turbidity (NTU)	D.O. (mg/L)	Temp. (C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
	0		8.20	484	6	<sub>1</sub> 5	12.6	0.2	165		
	5		8.10	568	192	4.3	13.4	0.2	140		
	Sampling		7.80	563	61	2.3	12.7	0.2	85		
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Comment			:- 4 - 1 - 1								

Comments:

Water is turbid.

<sup>\* -</sup> Measurement taken from top of well casing



Well ID No.: SP-1B (MW-10B)

Well Casing Type: 1.5" PVC

Start SWL: N/A

Project: Harrison SVE 446-311

Well Depth\*\*: 26.77

Water Column Ht.: N/A

**Date: 1/24/02** 

Screened Interval: N/A

Well Casing Volume (gallons): N/A

Crew: TMS/ET

Well Elevation\*\*: N/A

SWL During Sampling: N/A

Purge Method: N/A

Ground Elevation: N/A

Sample Time: N/A

Meters Used: N/A

Well Condition: Fair

Sample Method: N/A

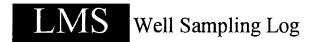
PID Head Space (ppm): N/A

Weather Conditions: Rain/Drizzle, 40 degrees.

Sample Analyses: No Samples Collected - Unable to open well.

Time	Est. Gal. Purged	Purge Rate (gpm)	pН	Cond.	Turbidity (NTU)	D.O. (mg/L)	Temp.	(C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
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Comments	S:	Unable	to open w	ell. Well i	is marked "	MW-10B"						

<sup>\* -</sup> Measurement taken from top of well casing



Well ID No.: SP-2

Well Casing Type: 1.5" PVC

Start SWL: 8.17

Project: Harrison SVE 446-311

Well Depth\*\*: 18.48 ft

Water Column Ht.: 10.31

**Date:** 1/24/02

Screened Interval: N/A

Well Casing Volume (gallons): 0.950/3

Crew: TMS/ET

Well Elevation\*\*: N/A

SWL During Sampling: 9.4

Purge Method: Bailer

Ground Elevation: N/A

Sample Time: 1230

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

Well Condition: Fair

Sample Time. 1230

10 ( ) 0000

wen condition. 1 and

Sample Method: Bailer

PID Head Space (ppm): 0.2-0.5

Weather Conditions: Rain/Drizzle, 40 degrees.

Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

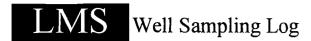
and 4500-CO2D

Time	Don Out	Purge Rate (gpm)	pH	Cond.	Turbidity (NTU)	D.O. (mg/L)	Temp. (C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
	0		8.00	560	25	5.6	12.9	0.3	45		
	5		8.10	713	778	5.3	13.5	0.4	-51		
	Sampling		8.00	921	141	4	12.8	0.3	-26		
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Comments			in tradical			1					

Comments:

Water is turbid.

<sup>\* -</sup> Measurement taken from top of well casing



Well ID No.: SP-3

Well Casing Type: 1.5" PVC

Start SWL: 8

Project: Harrison SVE 446-311

Well Depth\*\*: 19.95

Water Column Ht.: 11.95

Date: 1/24/02 Crew: TMS/ET

Screened Interval: N/A
Well Elevation\*\*: N/A

Well Casing Volume (gallons): 1.1/3.5 SWL During Sampling: 9.42

Purge Method: Bailer

Ground Elevation: N/A

Sample Time: 1245

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

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Sample Time, 1243

Micros Obcur Diction, 18150

Well Condition: Fair

Sample Method: Bailer

PID Head Space (ppm): 1.6-4.3

Weather Conditions: Rain/Drizzle, 40 degrees.

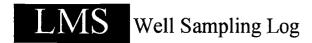
Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

and 4500-CO2D

Time	Est. Gal. Purged	Purge Rate (gpm)	рН	Cond.	Turbidity (NTU)	_	Temp. (C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
	0		8.30	345	44	8.2	13.5	0.2	-38		
	5		8.20	367	48	7	13.3	0.2	-55		
	Sampling		8.00	447	27	5.7	13.2	0.2	<b>-6</b> 7		
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Commonts							<u> </u>				

Comments:

<sup>\* -</sup> Measurement taken from top of well casing



Well ID No.: SP-4

Well Casing Type: 1.5" PVC

Start SWL: 6.42

Project: Harrison SVE 446-311

Well Depth\*\*: 20.9 ft

Water Column Ht.: 14.48

Date: 1/24/02

Screened Interval: N/A

Well Casing Volume (gallons): 1.33/4

Crew: TMS/ET

Well Elevation\*\*: N/A

SWL During Sampling: 7.55

Purge Method: Bailer

Ground Elevation: N/A

Sample Time: 1315

Meters Used: DRT15CE, YSI30-02, YSI21, ORP-9, CP98-12

Well Condition: Fair

Sample Method: Bailer

PID Head Space (ppm): 1.8-4.4

Weather Conditions: Rain/Drizzle, 40 degrees.

Sample Analyses: EPA Methods 8260B, 6010B (fitered and unfiltered Iron), 353.2,4500-S04, 415.1,

and 4500-CO2D

Time	Est. Gal. Purged	Purge Rate (gpm)	pН	Cond.	Turbidity (NTU)	D.O. (mg/L)	Temp. (C°)	Salinity (%)	ORP (mV)	Depth to Water*	Comments
	0		7.80	525	29	3.7	12.4	0.3	-70		
	5		8.00	525	39	4.2	13.1	0.3	-80		
	Sampling		7.90	430	32	4.2	13.3	0.3	-80		
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	_				<b>  </b>						
Comments											

Comments:

<sup>\* -</sup> Measurement taken from top of well casing

# ATTACHMENT C MONITORING WELL BORING LOGS



## Tyree Environmental BORING/WELL LOG BORING/WELL NO. MW-1

<u></u>	•	-					
1	T: NYS OFFI				DATE STARTED: _A DATE COMPLETED:		
	CT: <u>NYS_DO</u>				DRILLER: CONNEC		
LOCAT	TION: <u>NEW K</u>	ING STR	EET. HARRIS	ON. NY	LOGGED BY: CHR	ISTIAN	FITZGERALD
Depth Below Grade		Blow Counts	Well Completion	Field Description of	Soil	` <b> </b> -	- BORE HOLE DATA
-0		<del></del>		0-0.5° Asphalt and Base		, N	lethod: Hollow Stem Auger lole Dia.: 10.5"
-	13.4 3-			0—2' brown—oronge sills	/clay w/ís		Pepth: 8.5'
作。		<u> </u>					WELL DATA
5		7-16 1-15		2-5' brown silts and fire and quartz gravel			diser ype: <u>SCH 40 PVC</u>
				7-9' brown silt w/some	gravel to refusal	'   F	Riser Dia.: <u>4"</u> Riser Length: <u>1'</u> nterval: <u>0' BG - 1' BG</u>
10				•			Gereen Type: Sch 40 PVC
						Į.	Screen Dia.: 4"
15					•		Screen Length: 7.5'
						ì	Slot: 0.010" nterval: 1' -8.5'
(							FILTER PACK
20				·		ļ	Source: Morie Company, NJ Composition: #2 Silica Sand Volume Used: 6 cubic ft.
							interval: 1' - 8.5'
25	5				. ·		GROUT / SEAL
							Type: Bentonite/Cement Mix Volume Used: 1 cubic (t. Interval: .5' - 1
···	0				,		WELL HEAD CONPLETION
		•					Manhole: X YES NO
3	5 .,				<u>ノ</u>		Concrete Pad: ∑YES ☐ NO Size: 24" x 24" x 8"
				LEGEND	,		WELL DEVELOPMENT
m b	concrete  native soil pentonite neal vell sand	自計	p little=10-2	fine sand=0.13-0.25m medium sand=0.25-0 course sand=0.5-1mm	gravel=4-64 .50mm cobble=64- boulder=256	4mm 256mm 6mm	Performed: X YES NO Method: 12V sub-pump  Duration: 5 well volumes  Date: 4/11/95



# Tyree Environmental BORING/WELL NO. BORING/WELL NO. MW-2

						DATE STARTED:	APDII 3	1005
	,			ENERAL SER	<del></del>	DATE COMPLETE		
*				UNANCE GAR		DRILLER: CONN		
OCAT	ION: <u>NEW</u>	KING	STRE	ET. HARRISO	N. NY .	LOGGED BY: CI	IRISTIAN	FITZGERALD
Napth low made	P.J.D. Reading (ppm)	Blow		Well completion	Field Description o	f Soil -		BORE HOLE DATA
			<del>_</del>		0-0.5 Asphall and Bas	•		delhod: Hollow Slem Auger
	252	9-12 9-7			0.5–2' fine yellow sand kneiss gravel	lo dork clay w/s	iome 1	Hole Dia.: 10.5" Depth: 12'
L	<del>-</del> -		-		•			WELL DATA
5	1567	6-11			2-5' organics, dark sai 5-7' clays and silts wil			Riser
<b>-</b> -	1367	10-11			and quartz gravel	.n organics		Type: SCH 40 PVC  Riser Dia.: 4"
								Riser Length: 2'
	567	8-16	$\overline{}$		7-10' organics, dark b	rown is w/little go	ravel	Screen
		26-50			10-12 weathered rock.	refusol at 12°		Type: Sch 40 PVC
F								Screen Dia.: 4" Screen Length: 10'
15		1					ŀ	Slot: _ 0.010"
						•		Interval: 2' -12'
'								FILTER PACK
20								Source: Morie Company, NJ Composition: #2 Silica Sand
					and the second seco			Volume Used: 7 cubic fl.
<u> -</u>							}	Interval: 1' - 12'
25	; <del> </del>		_		·			GROUT / SEAL
H_						•		Type: <u>Bentonite/Cement Mix</u> Volume Used: 1 cubic ft.
F						•		Interval: .5' - 1'
` — 30	)	·					1	WELL HEAD COMPLETION
Ŀ	•							Manhole: X YES NO
<b>*</b>					;			Size: 12"  Concrete Pad: ∑YES ☐ NO
3:	5 L			:	,			Size: 24" x 24" x 8"
•					LEGEND		<del></del>	WELL DEVELOPMENT
	oncrele	PVC	Syc Syc	trace=1-10				Performed: X YES NO
	ative soil		H "	little=10-20	fine_sand=0.13-0.25m	\ <del>-</del>		Method: 12V sub-pump
ै । उस्ते	enlonile eal	solid		some=20-3	0% course sand=0.5-1mi	n boulder=2	56mm	Duration: 5 well volumes
w	ell sand	``	⊢ s	and=30-502	very course sand=1-	2mm groundwat	er lable	Dale: 4/11/95



## Tyree Environmental Technologies Darabury, CT. BORING/WELL NO. MW-3

PROJECT: NYS DOT MAINTAINANCE G	ARAGE	DATE STARTED: APRIL:  DATE COMPLETED: APRIL  DRILLER: CONNECTICUT  LOGGED BY: CHRISTIAN	L 3. 1995 TEST BORINGS
	Field Description o		BORE HOLE DATA  Drilling Method: Hollow Stem Auger
9-13 11-12	0-0.5' asphalt and bas 0.5-2' fine yellow sand kneiss gravel		Hole Dia.: 10.5"  Depth: 12'
1307 4-6 4-5	2-5' organics, dark so 5-7' clays and silts wi and quartz gravel	<del></del>	Riser Type: SCH 40 PVC Riser Dia.: 4" Riser Length: 2"
1357 9-4	7-10' organics, dark b		Interval: 0' BG - 2' BG  Screen Type: Sch 40 PVC
15	12 12 11011110 1001		Screen Dia.: 4"  Screen Length: 10'  Slot: 0.010"  Interval: 2' -12'
20			FILTER PACK  Source: Morie Company, NJ  Composition: #2 Silica Sand  Volume Used: 9 cubic ft.  Interval: 1' - 12'
- 25			GROUT / SEAL  Type: Bentonite/Cement Mix  Volume Used: 1 cubic ft.  Interval: .5' - 1'
30			WELL HEAD COMPLETION  Manhole: YES NO  Size: 12
35	LEGEND		Concrete Pad: YES NO Size: 24 x 24 x 8 well Development
concrete  native soil  rentonite eal  well sand  native soil  native soil	very fine sand=0.6-0 fine sand=0.13-0.25n medium sand=0.25-0 course sand=0.5-1m	nm gravel=4-64mm 0.50mm cobble=64-256mm m boulder=256mm	Duration: 5 well volumes



## BORING/WELL LOG

BORING/WELL NO. MW-4

	CLIENT: NYS OFFICE OF GENERAL SERVICES					DATE STARTED: APRIL 3, 1995 DATE COMPLETED: APRIL 3, 1995	
<b>.</b>	PROJECT: NYS DOT MAINTAINANCE GARAGE LOCATION: NEW KING STREET, HARRISON, N					DRILLER: CONNECTICUT LOGGED BY: CHRISTIAN	
ł	Deplh Below	P.I.D. Reading	Blow	Well			BORE HOLE DATA
1	Grade	(ppm)		Completion	Field Description o	f Soil	Drilling Method: <u>Hollow Stem Auger</u>
	F°	180	7-8		0-0.5° asphalt and bas		Hole Dia.: 10.5"
1	-		4-8		0.5-2' organics with fir	ne lite brown sand	Depth: 12
	F				a s' accordes destres	l	WELL DATA
	5	0.0	5-8		2—5' organics, dark soi		Riser Type: SCH 40 PVC
			16-26		5-7' dark brown fs w/	little gravel ,	Riser Dia.: 4"
Į							Riser Length: 2' Interval: 0' BG - 2' BG
	10	747	7-23		7—10' organics, dark b	rown fs w/little gravel	Screen
			11-12		10-12' weothered rock,	. refusal of 12'	Type: Sch 40 PVC
-							Screen Dia.: 4" Screen Length: 10'
	15			-			Slot: 0.010"
							Interval: 2' -12'
<i>-</i>			<del> </del>	-			FILTER PACK
	20	)		-			Source: Morie Company, NJ
}							Composition: #2 Silica Sand Volume Used: 9 cubic ft.
,	-		<del>                                     </del>				Interval: 1' - 12'
	   25	j					GROUT / SEAL
•				-			Type: Bentonite/Cement Mix
	1						Volume Used: 1 cubic ft. Interval: .5' - 1'
,	-  -30	0		<u> </u>			WELL HEAD COMPLETION
		<del></del> -		-			Manhole: X YES NO
-	JF.			<u></u>			Size:
		<u> </u>				·	Concrete Pad: XYES ☐ NO
s'	3	٠,.				<del></del>	Size: 24" x 24" x 8"
l,		oncrete		• •	<u>LEGEND</u>		WELL DEVELOPMENT.
		alive soil	1 1 5 1	trace=1-10	11	0.13mm pebble=2-4mm nm gravel=4-64mm	Performed:   ☐ YES ☐ NO  Melhod: 12V sub-pump
i .	\ \ \ \ \ \ \	entonite eal	solid	o some=20-2	medium sand=0.25-0	0.50mm cobble=64-258mn	
		ell sand		and=30-50			Dale: 4/11/95

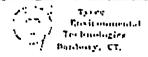
## Tyree Five-commental Technologies Backers, C7.

## BORING/WELL LOG

HORING, WELL, NO

7/11/-2

	October 27 1995						
PROJECT: NYSBOT Budding DATE COMPLET DRILLER: Comp	ED. October 27, 1995 ecticut Test Borines, Inc.						
LOCATION: Cld King Street Connector, Hacrison, NY LOGGED BY: B	tent litteron						
Below Reading Blow Well Field Description of Soil Grade (ppm) Counts Completion	BORE HOLE DATA						
O Counts Completion 0'25' asphalt	Method: H.S.A.						
	Hule Dia.: 6 1/4"						
	Depth. 12'						
Split Spoon Sample 3'-5' black to dark brown fine compan	WELL DATA						
5 (3)	Riser						
	Type: PVC Riser Dia.: 4"						
5'-10' gray silt, little very fine to coafine to coarse gravel, occasional cobbl	rse sand Riser Length: 2'						
	Interval: 0-2'						
10 1176 4.10,11.15 Split Spoon Sample	Screen						
10'-12' weathered rock, 2' dark brown							
	Screen Dia.: 4						
15	Screen Length: 10'						
	interval: 2'-12'						
	FILTER PACK						
20	Source: Morie Comzany Composition: #2 silica sand						
	Volume Used:						
	Interval: 1.5'-12'						
	GROUT/SEAL						
	Type: Bentonile Chips						
	Volume Used: Interval: 1'-1.5'						
	WELL HEAD COMPL.						
- 30							
	Riser: TYES W NO						
	Type: thanhole						
35	Concrete Fad: X YES XC Size: 12						
E. LEGENO	WELL DEVELOPMENT						
@ demerote							
mative soil   2	-04mm Method: Eailed						
mative soit  bentonite  bentonite  consequence  consequen	4-256mm 266mm Duration:						
well sand   and=30-50z very coarse sand=1-2mm groundwa	ster table Date:						

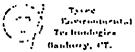


# BORING/WELL LOG

BORING/WELL NO.

MW = G

CUENT: State of New York Office of General Services	DATE STARTED: October 27, 1995		
project: Nyspot Railding	DATE COMPLETED: October 27, 1995		
LOCATION: And King Street Connector Barrison NY	DRILLER: Connecticut Test Borings, Inc. LOGGED BY: Brent Fitteron		
bepth P.I.D.			
	iption of Soil BORE HOLE DATA		
	Drilling Method: HSA.		
a,-152, vahpajr	Hole Dia.: 6 1/4		
	Depth: 15°		
Spilt Spoon Sample 3'-5' black to dark  Spilt Spoon Sample Si-7' till, some cobb fine/medium sand  Split Spoon Sample 10'-12' weathered re fine sand, black to groundwater at 13'	gray sond (compact) WELL DATA		
5 177 7.9.11.15 See Spit Spoon Sample	Riser		
5'-7' Lill, some cobb			
1ine/medium sand	Riser Dia.: 4"		
	Riser Length: 5'		
	Interval: 0-5'		
10 413 3.3.5.11 Split Spoon Sample 10'-12' weathered refine sand, black to	ock, black to brown  Fray fredium rand  Type: PVC		
Time sand, disex to	Screen Dia : 4"		
groundwater at 13'	Sereen Length: 10'		
15 END OF	BORING Siet: 0.010		
	Interval: 5'-15'.		
	FILTER PACK		
- 20	. Source: Morie Company		
	Composition: #2 silica sand		
	Volume Used:		
	Interval; 4'-15'		
25	GROUT/SEAL		
<u>-</u>	Type: Bentanite Chips		
	Volume Used:		
1+	interval: 2'-4'		
20	WELL HEAD COMPL.		
	Riser: YES X NO		
	Type: menhole		
<u> </u>	Concrete Pad: X YES NO		
7 - 25	Size: 12"		
LEGEND	WELL DEVELOPMENT		
Sconerele De Eu	-0.13mm pebble=2-4mm Performed: X YES 10		
mative soil   C =   fine sand=0.13-0.25			
bentenite   2 = 3   intic=10-20%   inedium sand=0.25	-0.90mm cobbic=64-256mm Curation:		
well sand and and and and and and and and and	i i		



# BORING/WELL LOG

BORING/WELL NO.

CLIENT: State of New York Office of Ceneral Services DATE STARTED \_\_ October 27, 1995 DATE COMPLETED: October 27, 1995 PROJECT: NYSDOT Boilding DRILLER: Connecticut Test Borlings, Inc. LOCATION: Ohl Kive Street Converter Hacekon SY LUCCED BY: Brent Eliteron Depth BORE HOLE DATA Eclaw. Reading How Well 1 Field Description of Soil Grade (hbm) Counts Completion Drilling Method: H.S.A. · 0'-.25' asphalt Hule Dia.: G 1/4" Depth: 15 1,3,3,5 WELL DATA Split Spoon Sample 3'-5' gray compact line sand Riser 2.2 3,5,8,8 Type: PVC 5'-7' till, brown sand Riser Dia.: 4" Riser Length: 5" Interval: 0-5" Split Spoon Sample 3.7 10,15,17,17 Screen 10'-12' dark brown medium sand Type: PVC groundwater at 12" Screen Dia.: 4" .15" dark gray loose medium sand Screen Length: 10' "010.0 :Jol2 2.3 END OF BORING Interval: 5'-15' FILTER PACK Source: Merie Conteany Composition: 52 silica sand Volume Used: Interval: 4'-15' CROUT/SEAL Type: Bentonite Chios Volunic Used: Interval: 2'-1' WELL HEAD COMPL. 30 ☐ YES ② %0 Riser: Type: manhele Concrete Pad: [X] YES [ NO Size: 12" WELL DEVELOPMENT LEGEND 📆 concrete 層 5 trace...t - 10% Performed: [x] YES [] NO very fine sand=0.6-0,13mm pebble=2-4mm Malive zoll tine sand=0.13-0.25mm gravel=4-64in:n Method: Earled cabbic=64-256mm medium sand=0.25-0.50mm tentonite Duration: 200-20-30% ecorse sand=0.5-1mm boulder=256min and sand groundwater table Date: very coarse sand=1-2min ::02-05=Lnc

DIECT NAME:		COMPLETION LOG	PROJECT NUMBER: 446-158
Harrison Subresidenc	MW-9		
ENT:			
NYSDOT			•
Harrison NY			
TE DRILLED:		DATE DEVELOPED:	WELL CONSTRUCTION COMPLETED:
17-Mar-99	• • •	18-Mar-99	17-Mar-99
veloping метнор: Hand surging, pumpir	and ha	lling	
		INSPECTOR:	<u> </u>
ADE	0	J. Thomburg	
ASING	_	DRILLING CONTRACTOR: CT	-&E
SING EVATION		TYPE OF WELL: Sparge	·
		TYPE OF WELL: Sparge	
		STATIC WATER LEVEL: 6.27	DATE: 3/23/99
		MEASURING POINT: TOTA	AL DEPTH OF WELL: TOTAL DEPTH OF BORING
		MEASURING POINT: TOC	AL DEPTH OF WELL: TOTAL DEPTH OF BORING 21
		DRILLING METHOD	TYPE
	·	DIANIETER:	CASING:
		8"	NA
		SAMPLING METHOD	TYPE:
	<b>- 2</b>	DIAMETER:	NA WEIGHT:
		·	
		FALL:	INTERVAL:
	2.5		
	<b></b> 2.5	RISER PIPE LEFT IN PLA	ACE PVC
		DIAMETER: LEN	IGTH: JOINT TYPE:
	4	1.5"	4 Flush
		SCREEN	MATERIAL:
		INTERVAL: DIAMETER:	PVC
		4-14' 1.5"	·
		STRATIGRAPHIC UNITS SCREENED:	
		overburden/Saprolite	•. 0.01
		FILTER PACK	GRADE:
		SAND: GR	AVEL: NATURAL:
	<del>-</del> 14	X	
4 4000		AMOUNT:	INTERVAL:
	21,5	250#	2.5-21
NOT TO SCALE	į	SEAL(s)	
NOTES:		Portland Cement INTE	RVAL: AMOUNT:
,		· \	2.0-17
		Bentonite Slurry INTE	ERVAL: AMOUNT:
		Bentonite Pellets	•
		תאו י	erval: amount: 2-2.5
•			ERVAL: AMOUNT:
•.			

TEST BORING/HONITORING WELL CONSTRUCTION LOG						Pan	elof1	
	<del></del>				on Subresidency			I.D.: SP-O!
	Harri					Drilling Co.: CTGE -		
tior er	446-1	35			•		w stem auger	
NYS	TOO				· · · · · · · · · · · · · · · · · · ·	Date Begin/End: 4/14/97		
						Custom Floury	<u> </u>	
ocal	ion:			•	<u>·</u>		· · · · · · · · · · · · · · · · · · ·	
t: <u>-</u>	John The	היטקחום		<del></del>	-	Total Depth:20		
T	8	2		•	8500081	C DESCRIPTION	MELL	DIABRAN
§	홍	3	P	₩	and = 35-50%			•
ž		題	PED / FED	тносову	some = 20-35%	m = medium	1	
מאים מים	BLOWS/ 8 INCHES	RECOVERY	呈	<b>吾</b>	little = 10-20% trace = 0-10%	c = coarse		
١	굺	<b>#</b>		<b> </b>	11 BCE - U-IUA			ground surface
_	12	1.0		1///	Brown, fine-medium	sand, trace silt. Hoist.		flush mount well
3	13			1/1/				:
	11 10			1///			<del> </del>	grout
,	9.	2.0	]	17.7.	Dark gray silt, fine-	medium sand. Hoist.		•
7	. 8			17.77.				_
	11	•		٠٠٠٠	Dark grave fine-mark	Jium sand, little slit, trace	+	•
		ļ		6.00.		Brown, fine-medium sand,		<b>Y</b>
52				0.70.7	trace silt. Wet. Sil			*
¥		,			Pushing cobble with	augers. No split spoon		
	Ì	l		1///	recovery. Cultings	have strong odor.		•
	١	}	1	17.77	Fine-medium sand,	some silt.		
		1		17.77		•		2.0" sch 40 PYC
	<b>\</b> .		}	17.77				
	1		Ì			·		
	50/0	}		11/1	· .			•
				11/1	1	,	<b>├</b> 👸 · 🖁	
	].		-	137	4			•
		1		1//	4 .	·		•
				1.72	1			•
		1		1.77				
•				1.7.		•		· "~?
	'			1,71				bentonite pelle
				1.7%				•
	50/0	1	_   .	1.7%	N			
-		1.	"   ·	1.7				— ≢1 Morie sand
			. }	1.7.				
	50/	ן כ		1.7%	Ä			
	·   ' ·			1.7%		•	<u>}</u>	10 slot sch 40
	1.			1.77		•		PVC screen
ı								endcap .
	ł	- 1	- 1		END OF BORING	AF ZU FI.	l l	
	ļ	ĺ		·		•	ŀ	•

DIECT NAME:	WELL No.: SP-1B
Harrison Subresidency	Sr-16
NYSDOT	
CATION:	
Harrison, NY TE DRILLED: DATE DEVELOPED:	WELL CONSTRUCTION COMPLETED:
16-Mar-99 18-Mar-99	. 17-Mar-99
VELOPING METHOD:	
Hand surging and pumping	
ADE 0 INSPECTOR:	
DRILLING CONTRACTOR: C	CT&E
SING	•
TYPE OF WELL: Sparge	
STATIC WATER LEVEL: 2.64	DATE: 3/23/99
1850 65A	
MEASURING POINT: TOC	TAL DEPTH OF WELL: TOTAL DEPTH OF BORIN 28
DRILLING METHOD	TYPE:
DIAMETER:	NX core
3" .	NA
SAMPLING METHOD.	TYPE:
DIAMETER:	WEIGHT:
2"	140#
FALL:	INTERVAL:
FALL: 24"	10-20'
2.5 RISER PIPE LEFT IN PL	ACE PVC
DIAMETER: LE	ENGTH: JOINT TYPE:
<u> </u>	22.5 Flush
SCREEN	MATERIAL: PVC
INTERVAL: DIAMETER: 22.5-26.5 1.5"	· · · · · · · · · · · · · · · · · · ·
22.5-26.5 1.5"	,
STRATIGRAPHIC UNITS SCREENED	
bedrock	0.01
FILTER PÄCK	GRADE:
[8] [1] [1] [2] [2] [2] [2] [2] [3] [3] [3] [4] [4] [4] [4] [4] [4] [4] [4] [4] [4	RAVEL: NATURAL:
AMOUNT:	INTERVAL:
28 250#  NOT TO SCALE SEAL(s)	20-22.5
TOT TO SCALE	
NOTES: Portland Cement	TERVAL: AMOUNT:
Donto the Change	2.0-19
Bentonite Slurry INT	TERVAL: AMOUNT:
Bentonite Pellets	
IN IN	iterval: amount: 2-2.5
Other: IN	YTERVAL: AMOUNT:

	EST DO	RING	מחשי	TORING WELL CONSTRUC	TION LOG	Pac	ge i of i	•
Project Name: Harrison Subresidency						I.D.: SP-02	.•	
ation	Harris				·		· · · · · · · · · · · · · · · · · · ·	
her	446-13	5			Drilling Method: 4.25" Hollor	rstem auger		
NYS	TOO	,		· • · ·	. Date Begin/End:4/14/97	· · · · · ·		
Sile	I.D	, .	•		Surface Elevation:  Depth to Water:	· · · · ·		• •
it:	John Tho	rnburg	•		Total Depth: 20			:
_					· · · · · · · · · · · · · · · · · · ·	VET I	. DIABRAN	.•
5	6 NOYER	3	B		IC DESCRIPTION  f = fine	, · ·	Danotan.	•
11745	BLOWS/ 6 )	RECOVERY	P2D / F2D	and = 35-50x some = 20-35x Ellie = 10-20x	m ≈ medum c = coarse			
<b>A</b>	8	足		trace = 0-10X			ground surface	•
1-22	6	2.0		Gray and dark gray	, fine-coarse sand, some		flush mount well .	
#	8 4			S. S	at		grout	
				7.67.6 2.67.6			grout	,
				6,6,6			,	•
<b>↑</b>	4 3	0.4		Olive gray, silty fin	e-medium sand, trace fine			
F SS-	4 3			gravel. Moist FILL	Cultings have fuel odor.		¥ .	. ,
		•		6.6. 6.76.				
•				(, °, °, °, °, °, °, °, °, °, °, °, °, °,				
•				6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6				
		ļ	i	6,6	•			
<u> </u>	7			0.00	and bear for any	<del> </del>     •   •	2.0" sch 40 PVC	
55-3 -	7 17	1.5			sand, trace fine-coarse Het. Cuttings have fuel		•	
<b>¥</b>	50/3			7676		1 8 8		. •
	}		.	0.6.6.			· ·	
	1			6.6				1:::
	50/0			(d. ,d. ) (d. ,d. )	•	+ 🖁 🖁	bentonite pellets	
				0.70. 16.76:	· · · · · · · · · · · · · · · · · · ·	_   _ 🛭 . 🖺		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
			1	6.6.	· · · · · · · · · · · · · · · · · · ·			
				6,6,6			#i Horie sand	
1	35			0.00 17 N-17 B Black	organic silt with roots, and	<del> </del>		*
SS-4	17.	1.8		decayed vegeta	ation.		10 slot sch 40 PVC screen	
1 1	29		- 1	17.8-18.2 Gray r	ock, broken cobble. Dry.			

DIECT NAME:		MPLETION LOG	PROJECT NUMBER: 446-158  WELL No.:
Harrison Subresidency	SP-3		
ENT:			
NYSDOT  CATION:	•		
Harrison, NY			
TE DRILLED:	DAT	E DEVELOPED:	WELL CONSTRUCTION COMPLETED:
17-Mar-99	·	18-Mar-99	17-Mar-99
VELOPING METHOD:	!		
Hand surging and pur	iping	Trucas con.	
ADE	0	INSPECTOR:  J. Thornburg	
		DRILLING CONTRACTOR: CT&	E
SING EVATION -	٠.	TOTAL OF MENT	
		TYPE OF WELL: Sparge	•
		STATIC WATER LEVEL: 6.59	DATE: 3/23/99
		1	
	•	MEASURING POINT: TOC TOTAL	DEPTH OF WELL: TOTAL DEPTH OF BORING 20.5
		DRILLING METHOD	TYPE:
			HSA
		DIAMETER:	CASING:
		SAMPLING METHOD	· TYPE:
	- 2	DIAMETER:	· NA NA
		DIAMETER	WEIGHT:
		5	The state of the s
		FALL:	INTERVAL:
	- 2.5		(MATERIAL:
		RISER PIPE LEFT IN PLAC	E PVC
	_4	DIAMETER: LENGT	
	4	2.11.00 (4.1.00)	18 Flush
		SCREEN	PVC
		INTERVAL: DIAMETER: 18.5-20.5 1.5"	
	•	ì	
		STRATIGRAPHIC UNITS SCREENED: Saprolite	SLOT SIZE: 0.01
		FILTER PACK	GRADE:
		SAND: GRAV	ZEL: NATURAL:
	<del>-</del> 14	X amount:	Interval:
7. (************************************	20.5	250#	17.5-20.5
NOT TO SCALE	20.0	SEAL(s)	
NOTES:		Portland Cement INTERV	
		Pantonita Sluim	0-16.5
		- 11121	VAL: AMOUNT:
		Bentonite Pellets	Val.
		2-	VAL: AMOUNT: 2.5
•		Other: INTER	LVAL: AMOUNT:

ECT NAME: Harrison Subreside	ncv		WELL No.: SP-4
NT:	il Cy	<u> </u>	<u> </u>
NYSDOT			
ATION:			
Harrison NY EDRILLED:		DATE DEVELOPED:	WELL CONSTRUCTION COMPLETED:
. 17-Mar-99	• '	18-Mar-99	17-Mar-99
ELOPING METHOD:	· · · · · · · · · · · · · · · · · · ·		
Hand surging and p	umping		
		INSPECTOR:	
NDE	0	J. Thomburg  DRILLING CONTRACTOR: CT	0 <del>=</del>
SING.	<del></del> .	DRILLING CONTRACTOR: CT	α <u>.</u>
TANION		TYPE OF WELL: Sparge	•
		· -	
		STATIC WATER LEVEL: 3.67	DATE: 3/23/99
		MEASURING POINT: TOCA	L DEPTH OF WELL: 21.5
		TOC	21.5 21.5
		DRILLING METHOD	TYPE HSA
		DIAMETER:	CASING:
		8"	NA
		SAMPLING METHOD	TYPE:
	<del></del> 2	DIAMETER:	WEIGHT:
		DIAVE LEC	WEIGHT:
	•	FALL:	INTERVAL:
	•	, ratte	INTERVAL
	<b> 2</b> .5		MATERIAL:
		RISER PIPE LEFT IN PLA	CE PVC
		DIAMETER: LENG	
	4	1.5"	19 Flush
		SCREEN	PVC
		INTERVAL: DIAMETER:	
		.   19.5-21.5 1.5"	
		STRATIGRAPHIC UNITS SCREENED:	SLOT SIZE:
		Saprolite	0.01
		FILTER PACK	GRADE:
		3-3 C C C C C C C C C C C C C C C C C C	<u>~~~v.</u>
	14.	SAND: GRU	AVEL: NATURAL:
	, ,,	AMOUNT:	INTERVAL:
<del></del>	21.5	250#	18-21.5
NOT TO SCA	TE	SEAL(s)	
NOTES:		Portland Cement INTER	
•	•	Pantonita Clume	2.0-17
		Demonite Starty INTE	RVAL: AMOUNT:
		Bentonite Pellets	
		INTE	RVAL: AMOUNT: 2-2.5
•		l	ERVAL: AMOUNT:
<u>.</u>			•

# ATTACHMENT D MITKEM ANALYTICAL DATA



"Environmental Testing For The New Millennium"

February 8, 2002

LMS Engineering One Blue Hill Plaza, PO Box 150 Pearl River, NY 10965 Attn: Ms. Maria Heincz

RE: Client Project: Harrison Spill Site, 446-311 Mitkem Lab Project # 90103

Dear Ms. Heincz:

Enclosed please find the data report of the required analysis for the samples associated with the above referenced project.

If you have any questions regarding this report, please call me.

We appreciate your business

Sincerely,

Environmental Chamilatry Section

FEB 1 1 2002

Agnes R. Ng

CLP Project Manager

agres R16

# New York State Department of Environmental Conservation Sample Identification and Analytical Requirements Summary

Project Name: HAR PLISON	JSPIL	LSTT	E 446-33	sdg: :190101	3	
			A	nalytical Req	uirements	
		VOA	BNA	Pest		
Customer	Laboratory	GC/MS	GC/MS	PCBs *		
Sample Code	Sample Code	Method #	Method #	Method #	<u>Metals</u>	<u>Other</u>
·	·					12/11
			<del></del>			actohem
SPI	9010200	5260	,		6010	353. 2/450 415.1/2016
SPQ	cc2					'
SP-3	003		_			
SP-4	coy	7	-			
SP-1	0.05					
SPO	CC					
,SP-2	00%					
SP4	1208	_		\		
\(\sigma_j\) \(\begin{array}{c} \begin{array}{c} \cdot \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	1 (18				У	<del> </del>
			-			
					_	<del></del>
		_				
			II			
			,			

#### New York State Department of Environmental Conservation

# Sample Preparation and Analyses Summary Volatile (VOA) Analyses

Project Name:		_	SDG:		
HARRIZ	SON SP	TILSTE	446-311	90103	<u> </u>
Laboratory Sample ID	<u>Matrix</u>	Date <u>Collected</u>	Date Received <u>at Lab</u>	Date Extracted	Date <u>Analyzed</u>
90103001	40	1/24/10	1/25/02	NA	1/26/02
002		11	/ 1		<u> </u>
1773					1/30/02
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### New York State Department of Environmental Conservation

# Sample Preparation and Analyses Summary Volatile (VOA) Analyses

Project Name:	-0110	PILLS	TE 44/0	SDG:	
Laboratory Sample ID	Matrix	Analytical Protocol	Extraction  Method	Low/Med. Level	Dil./Conc. Factor
90103001	AQ	8260	NA	Lyns	1
ma				-	
003					
V 004		7	<u> </u>	<u> </u>	4
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#### New York State Department of Environmental Conservation

# Sample Preparation and Analyses Summary Inorganic Analyses

Project Name:		II ( ST) & 496-3	SDG:	
HARKT	SON St	1-1( 5.7) 2 4/96-3	490103	······································
1			Date	<b>.</b> .
Laboratory <u>Sample ID</u>	<u>Matrix</u>	Metals Requested	Received <u>at Lab</u>	Date <u>Analyzed</u>
Sample ID	Matrix	Metals Nequested	accau	Analyzeu
90103001	40	6010	1/25/02	1/25/02
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#### Analytical Data Package for LMS Engineers

Client Project: Harrison Spill Site, 446-311

SDG# 90103

Mitkem Project ID: 90103

February 8, 2002

#### **SDG** Narrative

Mitkem Corporation submits the enclosed data package in response to LMS Engineers' Harrison Spill Site project number 446-311. Under this deliverable, analysis results are presented for four aqueous samples that were received on January 25, 2002 and assigned Laboratory Number 90103. Analyses were performed per specifications in the project's contract and the chain of custody forms.

The following samples are submitted in this data package:

Client ID	<u>Lab ID</u>	Analysis
SP-1	90103001	V, M. DM, N, F, S, T
SP-2	90103002	V, M. DM, N, F, S, T
SP-3	90103003	V, M. DM, N, F, S, T
SP-4	90103004	V, M. DM, N, F, S, T

V = Volatile Organics – NYSDEC ASP Method 8260B

M = Iron - NYSDEC ASP Method 6010B

DM = Dissolved Iron – NYSDEC ASP Method 6010B

N = Nitrate - EPA 353.2

F = Free CO2 - SM 4500-CO2 C

S = Sulfates - SM 4500-SO4 E

T = Total Organic Carbon – EPA 415.1

The analyses were performed according to NYSDEC ASP protocols (October 1995 update) and reported per NYSDEC ASP requirement for Category A deliverable with the exception of nitrate, free CO2, sulfates and total organic carbon. Nitrate, free CO2, sulfates and total organic carbon are reported in the standard Mitkem format.

The following observation and/or deviations are observed for the following analyses:

#### 1. Overall Observation:

Where needed, manual integrations were performed to improve data quality. The corrections were reviewed and associated hardcopies generated and reported as required.

#### 2. Volatile Organic Analysis:

Sample results are reported to a nominal 1ppb level. These reporting limits are below the lowest initial calibration standard, but above laboratory method detection limits.

Surrogate recovery: recoveries were within the QC limits.

Lab control sample: spike recoveries were within the QC limits.

Sample analysis: no unusual observation was made for the analyses.

#### 3. Metals Analysis:

The metals analysis includes results for both total and dissolved iron. The total iron analysis has the letter "T" preceding the laboratory identification number and the dissolved iron analysis has the letter "D" preceding the laboratory identification number.

Lab control sample: spike recoveries were within the QC limits.

Sample analysis: iron was exceeded QC criteria for the serial dilution. Form Is are flagged with an "E" flag. No other unusual observation was made for the analyses.

#### 4. Wet Chemistry Analysis:

The reporting limit for nitrate in sample SP-4 was elevated due to sample matrix interference. This analysis involves the generation of a color, which is proportional to the concentration of the analyte in the sample. Without dilution, the color of the sample obscured the color change in the analysis.

No other unusual observation was made for the analyses.

The pages in this report have been numbered consecutively, starting from this narrative and ending with a page saying only "Last Page of Data Report".

I certify that this data package is in compliance, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Agnes Ng

CLP Project Manager

a year 1/2

02/08/02

Sample Transmittal Documentation



175 Metro Center Boulevard Warwick, Rhode Island 02886-1755 (401) 732-3400 • Fax (401) 732-3499 email: mitkem@mitkem.com

# CHAIN-OF-CUSTODY RECORD

Page \_\_\_\_\_\_ of \_\_\_\_\_

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YELLOW: REPORT COPY

PINK: CLIENT'S COPY

## **MITKEM CORPORATION**

01/25/02 01:31 PM

Page 1 of 2

Original

Logged In By:

Reviewed By:

Project Status: WP

Date Opened: 01/25/02 13:28

Date Closed: 01/25/02 13:31

1.15

Lab Workorder #: 90103

Lab Workorder

90103



Lawler, Matusky & Skelly Eng.

Lab Workorder ID:

HARRISON SPILL SITE 446-311

Client Proj ID:

446-173

Client PO#:

Client:

Project / Profile Name: NYSDOT Harrison SVE

Date Due:

02/08/02

Customer Service: Del Req'd:

ASP A (2 copies)

KEB

Completed?: Profile Notes:

8260 BTEX/MTBE+Napthalene at 1 ug/L, 8270 Napthalene & 2 methylnapthelene only

<u>Lab ID</u> 90103001	Client ID SP-1	<u>Matrix</u> W	Type SAMPLE	Analysis Code 353.2W NO2	<b>Collected</b> 01/24/02 12:15	Received 01/25/02	<u>Due</u> 02/08/02	Notes
				353.2W NO3 415.1W TOC 6010W Fe 6010W PREP 8260W S4500EWSO4				
				S4500WFCO2				
90103002	SP-2	W	SAMPLE	353.2W NO2 353.2W NO3 415.1W TOC 6010W Fe 6010W PREP 8260W \$4500EWSO4 \$4500WFCO2	01/24/02 12:30	01/25/02	02/08/02	
90103003	SP-3	W	SAMPLE	353.2W NO2 353.2W NO3 415.1W TOC 6010W Fe 6010W PREP 8260W \$4500EWSO4 \$4500WFCO2	01/24/02 12:45	01/25/02	02/08/02	
90103004	SP-4	W	SAMPLE	353.2W NO2 353.2W NO3 415.1W TOC 6010W Fe	01/24/02 13:15	01/25/02	02/08/02	
# 11								

|--|

Lab Workorder #: 90103

01/25/02 01:31 PM			Page 2 of 2		Original		
<u>Lab ID</u> <u>Client ID</u> 90103004 SP-4	<u>Matrix</u> W	Type SAMPLE	Analysis Code 6010W PREP 8260W S4500EWSO4 S4500WFCO2	Collected	Received	<u>Due</u>	<u>Notes</u>
90103005 SP-1	W	SAMPLE	6010W Fe 6010W PREP	01/24/02 12:15	01/25/02	02/08/02	DISS METALS
90103006 SP-2	W	SAMPLE	6010W Fe 6010W PREP	01/24/02 12:30	01/25/02	02/08/02	DISS METALS
90103007 SP-3	W	SAMPLE	6010W Fe 6010W PREP	01/24/02 12:45	01/25/02	02/08/02	DISS METALS
90103008 SP-4	W	SAMPLE	6010W Fe 6010W PREP	01/24/02 13:15	01/25/02	02/08/02	DISS METALS

#### **INVOICE AND REPORT GO TO:**

Maria Heincz Maria Heincz
Lawler, Matusky & Skelly Eng.
One Blue Hill Plz, PO Box 150
Pearl River, NY, 10965
E-Mail: mheincz@lmseng.com
W: 845-735-8300
F: 845-735-7466

# MITKEM CORPORATION

# Sample Condition Form

Page of

Received By:	Reviewed By:	ch/		Date:	1-3		2	MITKE	M Project: 90/03
Client Project: HARRISO		Client: LM						· · · · · · · · · · · · · · · · · · ·	10103
				Prese	ervation	(pH	)	VOÀ	Comments/Remarks
Condition:		Lab Sample IC	)	HNO3	H <sub>2</sub> SO <sub>4</sub>	HCI	NaO	Matrix	Corrective Action*
i) Custody Seal(s)	Present Absent	90103-00	1	< Z	12	ļ		ļ -	
•	Coolers/Bottles	08	2	<u> </u>	12		ļ	}. 	
	Intact/Broken	00	3	< <u>Z</u>	12				·
2) Custody Seal Number(s	) _ <i>N/</i> ····	₩ 08	4	< Z	12				
3) Chain-of-Custody	Present/Absent				<u> </u>		\	-	1.
4) Cooler Temperature	50		<del></del>		ļ	<u></u>	K	-	
Coolant Condition	108		7		1	1_	-	ļ .	
5) Airbill(s)	Present/Absent				1_	<del> </del>		<del> </del>	
Airbill Number(s)	8257-4014			$\Delta$		<del> </del>			
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6) Sample Bottles (	Intact				<del>-</del>	1	\ <del>\</del> -	-	
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7) Date Received	1-25.02	-	· · · · ·	1		<del> </del>	_	1	· · · · · · · · · · · · · · · · · · ·
8) Time Received	0845	-		+	1	-	1	1	
VOA Matrix Key:	<u> </u>			+-	-	+-	+	<b>\</b>	
US=Unpreserved Soil	M-=MeOH			+	-	<del>- </del>	-	<del>- </del>	
UA=Unpreserved Aqueou	-			+-	1	1	_		
M/N=MeOH & NaHSO4	H=HCI							·   `	
N=NaHSO4	A=Air				_		1		

# MITKE M CORPORATION

\* Volatiles \*

1A VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: MITKEM CORPORATION	Contract:
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: 90103
Matrix: (soil/water) WATER	Lab Sample ID: 90103001
Sample wt/vol: 5.000 (g/mL)	ML Lab File ID: V2E7787
Level: (low/med) LOW	Date Received: 01/25/02
% Moisture: not dec.	Date Analyzed: 01/26/02
GC Column: DB-624 ID: 0.25 (mm	n) Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)
CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q
1634-04-4Methyl tert 71-43-2Benzene 108-88-3Ethylbenzen 100-41-4Ethylbenzen 1330-20-7Xylene (Tot	1 U 1 U 2

FORM I VOA

1A VOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

Lab Name: MITKEM CORPORATION Con	SP-2
Lab Code: MITKEM Case No.: SA	S No.: SDG No.: 90103
Matrix: (soil/water) WATER	Lab Sample ID: 90103002
Sample wt/vol: 5.000 (g/mL) ML	Lab File ID: V2E7788
Level: (low/med) LOW	Date Received: 01/25/02
% Moisture: not dec	Date Analyzed: 01/26/02
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)
CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q
1634-04-4Methyl tert-butyl 71-43-2Benzene 108-88-3Toluene 100-41-4Ethylbenzene 1330-20-7Xylene (Total) 91-20-3Naphthalene	7 6 42

EPA SAMPLE NO.

Lab Name: MITKEM CORPORATION	Contract:
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: 90103
Matrix: (soil/water) WATER	Lab Sample ID: 90103003
Sample wt/vol: 5.000 (g/mL) ML	Lab File ID: V2E7825
Level: (low/med) LOW	Date Received: 01/25/02
% Moisture: not dec	Date Analyzed: 01/30/02
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)
CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q
1634-04-4Methyl tert-bu 71-43-2Benzene 108-88-3Toluene 100-41-4Ethylbenzene 1330-20-7Xylene (Total) 91-20-3Naphthalene	1 U 1 U 1 U

1A VOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

SP-4 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: 90103 Matrix: (soil/water) WATER Lab Sample ID: 90103004 Sample wt/vol: 5.000 (q/mL) ML Lab File ID: V2E7826 Level: (low/med) LOW Date Received: 01/25/02 % Moisture: not dec. Date Analyzed: 01/30/02 GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0 Soil Aliquot Volume: \_\_\_\_(uL) Soil Extract Volume: (uL) CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L CAS NO. COMPOUND 0 1634-04-4----Methyl tert-butyl ether 1 | ប 71-43-2----Benzene 1 U 108-88-3-----Toluene 1 U 100-41-4----Ethylbenzene 3 1330-20-7-----Xylene (Total) 2 91-20-3-----Naphthalene Ū 1

FORM I VOA

EPA SAMPLE NO.

	ן זיסאז מפי
Lab Name: MITKEM CORPORATION	Contract: V2ALCS
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: 90103
Matrix: (soil/water) WATER	Lab Sample ID: V2L0126A
Sample wt/vol: 5.000 (g/mL)	ML Lab File ID: V2E7774
Level: (low/med) LOW	Date Received:
% Moisture: not dec	Date Analyzed: 01/26/02
GC Column: DB-624 ID: 0.25 (mm	n) Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)
CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q
1634-04-4Methyl tert 71-43-2Benzene 108-88-3Toluene 100-41-4Ethylbenzer 1330-20-7Xylene (Tot 91-20-3Naphthalene	47 48 47 (al) 150

Lab Name: MITKEM CORPORATION	Contract: VBLK2A	
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: 90103	
Matrix: (soil/water) WATER	Lab Sample ID: V2B0126A	
Sample wt/vol: 5.000 (g/mL) ML	Lab File ID: V2E7773	
Level: (low/med) LOW	Date Received:	
% Moisture: not dec	Date Analyzed: 01/26/02	
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0	
Soil Extract Volume:(uL)	Soil Aliquot Volume:(u	L)
CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q	
1634-04-4Methyl tert-b 71-43-2Benzene 108-88-3Ethylbenzene 100-41-4	1 U 1 U 1 U 1 U	

Lab Name: MITKEM CORPORATION	Contract: VBLK2D
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: 90103
Matrix: (soil/water) WATER	Lab Sample ID: V2B0130A
Sample wt/vol: 5.000 (g/mL) ML	Lab File ID: V2E7823
Level: (low/med) LOW	Date Received:
% Moisture: not dec	Date Analyzed: 01/30/02
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)
CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q
1634-04-4	1 U 1 U 1 U 1 U 1 U 1 U 1 U 1 U 1 U 1 U

#### 2A WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: MITKEM CORPORATION

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: 90103

	EPA	SMC1	SMC2	SMC3	OTHER	TOT
	SAMPLE NO.	#	(DCE)#	(TOL)#	(BFB)#	OUT
		π	(DCD) #	======	\DrD/#	===
01	VBLK2A	90	82	97	104	0
02	V2ALCS	99	98	95	105	ŏ
03	SP-1	89	82	101	108	Ō
04	SP-2	91	82	99	110	0
05	VBLK2D	100	93	102	93	0
06	SP-3	99	92	103	94	0
07	SP-4	102	92	109	96	0
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QC LIMITS = Dibromofluoromethane (79-122)SMC2 (DCE) = 1,2-Dichloroethane-d4 SMC3 (TOL) = Toluene-d8 (76-121)(82-118)OTHER (BFB) = Bromofluorobenzene (85-120)

- # Column to be used to flag recovery values
- \* Values outside of contract required QC limits
- D System Monitoring Compound diluted out

page 1 of 1

FORM II VOA-1

#### FORM 3 WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: MITKEM CORPORATION

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: 90103

Matrix Spike - Sample No.: V2ALCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
	========	Z============		=====	======
Methyl tert-butyl ether	50		46	92	62-136
Benzene	50		47	94	78-121
Toluene	50		48	96	77-122
Ethylbenzene	50		47	94	76-120
Xylene (Total)	150		150	100	76-121
Naphthalene	50		42	84	52-137

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 0 outside limits Spike Recovery: 0 out of 6 outside limits

COMMENTS:	 	 	

	VBLK2A
tract:	

Lab Name: MITKEM CORPORATION

Cont

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: 90103

Lab File ID: V2E7773

Lab Sample ID: V2B0126A

Date Analyzed: 01/26/02

Time Analyzed: 1051

GC Column: DB-624 ID: 0.25 (mm)

Heated Purge: (Y/N) N

Instrument ID: V2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA	LAB	LAB	TIME
ì	SAMPLE NO.	SAMPLE ID	FILE ID	ANALYZED
				=========
01	V2ALCS	V2L0126A	V2E7774	1210
02	SP-1	90103001	V2E7787	2008
03	SP-2	90103002	V2E7788	2036
04	SF-2	90103002	V2E//06	2030
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page 1 of 1

FORM IV VOA

Lab Name: MITKEM CORPORATION

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: 90103

Lab File ID: V2E7823

Lab Sample ID: V2B0130A

Date Analyzed: 01/30/02

Time Analyzed: 1047

GC Column: DB-624 ID: 0.25 (mm)

Heated Purge: (Y/N) N

Instrument ID: V2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA	LAB	LAB	TIME
	SAMPLE NO.	SAMPLE ID	FILE ID	ANALYZED
	=======================================			========
01	SP-3	90103003	V2E7825	
				1215
02	SP-4	90103004	V2E7826	1242
03				
04				_
05				
06				
07				
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COMMENTS:							
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page 1 of 1

FORM IV VOA



\* Metals \*

#### U.S. EPA - CLP

## 1 INORGANIC ANALYSIS DATA SHEET

<b>EPA</b>	SAMP	LE NO.
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				DAIA				
Name:	MITTELL		Combi	4-			SP-1	
Name:	MITKEM_CO	ORPORATION	Contra	act:				
Code:	MITKEM	Case No.:	S	AS No	.:		SDG No.: 9	0103
atrix (soil/v	water):	WATER_			Lab Samp	le ID:	T90103001	
vel (low/m	ned):	MED			Date Rece	eived:	01/25/02	_
Solids:								
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L	
	CAS No.	Analyte	Concentration	C	Q	M		
	_7429-90-5	Aluminum				NR		
	_7440-36-0	Antimony				NR		
	_7440-38-2	Arsenic				NR		
	_7440-39-3	Barium				NR		
	_7440-41-7	Beryllium				NR		
	_7440-43-9	Cadmium				NR		
	_7440-70-2	Calcium				NR		
	_7440-47-3	Chromium				NR		
	_7440-48-4	Cobalt				NR		
	7440-50-8	Copper				NR		
	_7439-89-6	Iron	3720		E	P		
	_7439-92-1	Lead				NR		
	_7439-95-4	Magnesium				NR		
	_7439-96-5	Manganese				NR		
	_7439-97-6	Mercury				NR		
	_7440-02-0	Nickel				NR		
	7440-09-7	Potassium				NR		
	_7782-49-2	Selenium				NR		
	_7440-22-4	Silver	<u> </u>		1	NR		
	_7440-23-5	Sodium				NR		
	_7440-28-0	Thallium		<u> </u>		NR		
	_7440-62-2	Vanadium				NR		
	_7440-66-6	Zinc				NR		
		Cyanide				NR		
					L		_	
or Before	<u> </u>		Clarity Before:	_			Texture:	
or After:	•	<del></del>	Clarity After:	_			Artifacts:	
nments:								
	-							

FORM I - IN

SW846

#### 1 INORGANIC ANALYSIS DATA SHEET

	~	-	_		
EPA	SA	MPI	Æ.	NO	Ì.

b Name:		INORGAINE ANALYSIS DATA GILLET								
<b>.</b> .	MITKEM_CO	ORPORATION	Contr	act:				_		
b Code:	MITKEM	Case No.:	S	SAS No	·:	<del></del>	SDG No.:	90103		
atrix (soil/wat	ter):	WATER_			Lab Samp	ole ID:	D901030	01		
vel (low/med	):	MED			Date Reco	eived:	01/25/02			
Solids:										
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L			
Γ										
	CAS No.	Analyte	Concentration	С	Q	M				
	.7429-90-5	Aluminum				NR				
	_7440-36-0	Antimony				NR				
	7440-38-2	Arsenic				NR				
	_7440-39-3	Barium				NR				
	_7440-41-7	Beryllium_				NR				
	_7440-43-9	Cadmium				_NR				
	_7440-70-2	Calcium	_ <u></u>			NR				
	_7440-47-3	Chromium				NR				
	7440-48-4	Cobalt			-	NR				
	_7440-50-8	Copper				NR				
	_7439-89-6	Iron	68.0	B_	E	P				
_	_7439-92-1	Lead		_		NR				
	_7439-95-4	Magnesium			<u> </u>	NR				
Ĺ	_7439-96-5	Manganese				NR				
	_7439-97-6	Mercury				NR				
	_7440-02-0	Nickel				NR				
	_7440-09-7	Potassium				NR				
_	_7782-49-2	Selenium				NR				
	_7440-22-4	Silver				NR				
<u> </u> _	_7440-23-5	Sodium				NR				
	_7440-28-0	Thallium				NR				
<u> </u>	_7440-62-2	Vanadium				NR				
<u> </u>	_7440-66-6	Zinc				NR				
		Cyanide				NR				

FORM I - IN

#### 1 INORGANIC ANALYSIS DATA SHEET

EPA	•	4 %	INT	-	210	
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		22.0	ROANIC ANAL I 313					
							SP-	2
Name:	MITKEM_C	ORPORATION	Contr	act:				
b Code:	MITKEM	Case No.:		AS No.:	:		SDG No.:	90103_
atrix (soil/w	vater):	WATER_			Lab Samp	ole ID:	T901030	002
vel (low/me	ed):	MED			Date Rece	eived:	01/25/02	<u></u>
Solids:								
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L	
	CAS No.	Analyte	Concentration	C	Q	M		
	_7429-90-5	Aluminum_				NR		
	7440-36-0	Antimony				NR		
	7440-38-2	Arsenic				NR		
	_7440-39-3	Barium				NR		
	7440-41-7					NR		
	_7440-43-9	Cadmium				NR		
	_7440-70-2	Calcium				NR		
	_7440-47-3	Chromium				NR		,
	_7440-48-4	Cobalt				NR		,
	7440-50-8	Copper				NR		
	_7439-89-6	Iron	7590		_E	P		
	_7439-92-1	Lead				NR		
	_7439-95-4	Magnesium				NR		
	_7439-96-5	Manganese				NR		
	_7439-97-6	Mercury				NR		
	_7440-02-0	Nickel				NR		
	_7440-09-7	Potassium				NR		
	_7782-49-2	Selenium				NR		
	_7440-22-4	Silver				NR		
	_7440-23-5	Sodium				NR		
	_7440-28-0	Thallium				NR		
	_7440-62-2	Vanadium				NR		
	_7440-66-6	Zinc		<u> </u>		NR		
		Cyanide				NR		
lor Before:			Clarity Before:				Texture:	
lor After:	· 		Clarity After:				Artifacts:	
mments:								

FORM I - IN

#### 1 INORGANIC ANALYSIS DATA SHEET

	~ 4	A COL	LE NO.
PPA	-> <i>E</i>	ושאו	HNII

							SP-2
Name:	MITKEM_CO	ORPORATION	Contr	act:			
Code:	MITKEM	Case No.:	S	AS No	.:		SDG No.: 90103
ix (soil/w	vater):	WATER_			Lab Samp	le ID:	D90103002
l (low/me	ed):	MED			Date Rece	ived:	01/25/02
lids:							
	Concentration	Units (ug/L or mg/	kg dry weight):				UG/L
					-		
	CAS No.	Analyte	Concentration	C	Q	M	
		Aluminum				NR	
	7440-36-0	Antimony				NR	
	7440-38-2	Arsenic				NR	
	7440-39-3	Barium				NR	
	_7440-41-7	Beryllium				NR	
	7440-43-9	Cadmium				NR	
	_7440-70-2	Calcium				NR	
	_7440-47-3	Chromium_				NR	
	7440-48-4	Cobalt				NR	
•	7440-50-8	Copper				NR	
	7439-89-6	Iron	126	В	Е	P_	
	_7439-92-1	Lead				NR	
	_7439-95-4	Magnesium				NR	
•	7439-96-5	Manganese			<b>-</b>	NR	
	7439-97-6	Mercury				NR	
	_7440-02-0	Nickel				NR	
	_7440-09-7	Potassium				NR	
	7782-49-2	Selenium				NR	
	7440-22-4	Silver				NR	
	7440-23-5	Sodium				NR	
	_7440-28-0	Thallium				NR	
	_7440-62-2	Vanadium				NR	
	7440-66-6	Zinc				NR	
		Cyanide				NR.	
. D . C							Tanker
Before:			Clarity Before:	_			Texture:
After:			Clarity After:	_			Artifacts:
nents:	SOLVED META	TO EOD CAMPI	E SD 2				
בפות	SOLVED_META	ro_tov_samer	.E_SP-2				
		<del></del>	·				· · · · · · · · · · · · · · · · · · ·

FORM I - IN

#### 1 EPA SAMPLE NO. INORGANIC ANALYSIS DATA SHEET SP-3 Lab Name: MITKEM\_CORPORATION\_ Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: 90103 Matrix (soil/water): T90103003\_\_\_\_\_ WATER\_ Lab Sample ID: Level (low/med): Date Received: 01/25/02\_\_\_\_ MED\_\_\_\_ **%** Solids: Concentration Units (ug/L or mg/kg dry weight): UG/L C CAS No. Analyte Concentration Q M \_7429-90-5\_ Aluminum\_ NR NR \_7440-36-0\_ Antimony\_ NR \_7440-38-2\_ \_Arsenic\_\_ NR \_7440-39-3\_ Barium NR \_7440-41-7\_ \_Beryllium\_\_\_ \_7440-43-9\_ Cadmium\_ NR \_7440-70-2\_ Calcium\_ NR Chromium\_ NR \_7440-47-3\_ NR Cobalt\_ \_7440-48-4\_ NR \_7440-50-8\_ Copper\_\_ 1060\_ P\_ E. \_7439-89-6\_ \_Iron\_ NR \_7439-92-1\_ Lead\_ NR \_7439-95-4\_ \_Magnesium\_ NR 7439-96-5 Manganese\_ \_7439-97-6\_ NR Mercury\_ NR \_7440-02-0\_ \_Nickel\_ NR Potassium\_ \_7440-09-7\_ Selenium\_ NR \_7782-49-2\_ NR \_7440-22-4\_ Silver\_ Sodium\_ NR \_7440-23-5\_ NR \_7440-28-0\_ Thallium \_7440-62-2\_ NR Vanadium\_ \_7440-66-6\_ NR Zinc\_ Cyanide\_ NR Color Before: Clarity Before: Texture: Color After: Clarity After: Artifacts:

FORM I - IN

Comments:

#### 1 EPA SAMPLE NO. INORGANIC ANALYSIS DATA SHEET SP-3 MITKEM CORPORATION. Contract: Lab Name: Lab Code: SAS No.: SDG No.: 90103\_\_\_ MITKEM Case No .: WATER\_ Lab Sample ID: D90103003\_\_\_\_\_ Matrix (soil/water): Date Received: 01/25/02\_\_ Level (low/med): MED\_\_\_\_ Solids: UG/L Concentration Units (ug/L or mg/kg dry weight): CAS No. Analyte Concentration C Q M 7429-90-5 Aluminum\_ NR NR Antimony\_\_\_ 7440-36-0 NR Arsenic\_ \_7440-38-2 NR Barium \_7440-39-3\_ NR \_7440-41-7\_ Beryllium\_ 7440-43-9 Cadmium\_ NR Calcium\_ NR \_7440-70-2\_ NR Chromium\_ \_7440-47-3\_ NR Cobalt\_ \_7440-48-4\_ NR \_7440-50-8\_ Copper\_\_\_\_ 25.0 IJ E P \_Iron\_ NR \_7439-92-1\_ Lead\_ Magnesium\_ NR \_7439-95-4\_ NR 7439-96-5\_ \_Manganese\_ NR Mercury\_ \_7439-97-6\_ NR NickeL \_7440-02-0\_ NR \_7440-09-7\_ Potassium Selenium\_ NR \_7782-49-2\_ NR \_7440-22-4\_ Silver\_ Sodium\_ NR \_7440-23-5\_ Thallium NR 7440-28-0\_ NR 7440-62-2 Vanadium\_\_ NR 7440-66-6\_ Zinc\_ NR \_Cyanide\_ Color Before: Clarity Before: Texture: Color After: Clarity After: Artifacts: Comments: DISSOLVED\_METALS\_FOR\_SAMPLE\_SP-3\_\_\_\_\_

FORM I - IN

#### l INORGANIC ANALYSIS DATA SHEET

<b>EPA</b>	SA	MPI	Æ	NO.

ıb Name:								4
ıb Name:							SP-	4
	MITKEM_CO	ORPORATION	Contra	ict:				
ıb Code:	MITKEM	Case No.:	S	AS No	.:		SDG No.:	90103
atrix (soil/wa	iter):	WATER_			Lab Samp	le ID:	T901030	004
evel (low/med	i):	MED			Date Rece	ived:	01/25/02	- <u> </u>
Solids:								
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L	
	_					$\top$		
	CAS No.	Analyte	Concentration	С	Q	M		
	_							
	7429-90-5	Aluminum				NR		
	_7440-36-0	Antimony				NR		
	_7440-38-2	Arsenic				_NR		
L	_7440-39-3	Barium				NR		
	_7440-41-7	Beryllium				_NR		
	_7440-43-9	Cadmium				NR		
	_7440-70-2	Calcium				_NR		
<u> </u>	_7440-47-3	Chromium				NR		
	_7440-48-4	Cobalt				NR		
1	_7440-50-8	Copper				NR		
]	_7439-89-6	Iron	5350		E	P		
	_7439-92-1	Lead			_	NR		
	_7439-95-4	Magnesium			-,	_NR		
·	_7439-96-5	Manganese				NR		
	_7439-97-6	Mercury			_	NR		
	_7440-02-0	Nickel				NR		
	_7440-09-7	Potassium	<del> </del>			NR		•
-	_7782-49-2	Selenium	_ <del>_</del>			NR		
	_7440-22-4	Silver				NR		
	_7440-23-5	Sodium				NR		
-	_7440-28-0	Thallium			_	NR		
ļ	_7440-62-2	Vanadium				NR		
	_7440-66-6	Zinc				NR		
	<del>-</del>	Cyanide				_NR		
					L			
olor Before:		<u>.</u>	Clarity Before:	_			Texture:	
olor After:			Clarity After:	_			Artifacts:	
omments:								
omments:								
			<del>-</del>					

FORM I - IN

# 1 INORGANIC ANALYSIS DATA SHEET

EPA	9/	<b>NA</b>	or E	NO
EPA	Ð.	*IMT	LE	NU.

-		2222 A 2222	<b>~</b>				SP-4	
Name:	MITKEM_C	ORPORATION	Contr	act:				
Code:	MITKEM	Case No.:	S	AS No	o.:		SDG No.: 90	103
ix (soil/w	rater):	WATER_			Lab Samp	le ID:	D90103004_	
l (low/m	ed):	MED			Date Rece	ived:	01/25/02	-
lids:								
	Concentration	Units (ug/L or mg/	kg dry weight):				UG/L	
	CAS No.	Analyte	Concentration	С	Q	M		
	7429-90-5	Aluminum				NR		
	_7440-36-0	Antimony				NR		
	_7440-38-2	Arsenic				NR		
	_7440-39-3	Barium				NR		
	_7440-41-7	Beryllium				NR		
	_7440-43-9	Cadmium				NR		
	_7440-70-2	Calcium				NR		
	_7440-47-3	Chromium				NR		
	_7440-48-4	Cobalt				NR		
	_7440-50-8	Copper				NR		
	_7439-89-6	Iron	1810		E	P		
	_7439-92-1	Lead				NR		
	_7439-95-4	Magnesium				NR		
	_7439-96-5	Manganese				NR		
	_7439-97-6	Mercury				NR		
	_7440-02-0	Nickel				NR		
	_7440-09-7	Potassium				NR		
	_7782-49-2	Selenium				NR		
	_7440-22-4	Silver				NR		
	_7440-23-5	Sodium				NR		
	_7440-28-0	Thallium				NR		
	7440-62-2	Vanadium				NR		
	_7440-66-6	Zinc				NR		
		Cyanide				_NR		
					<u> </u>			
Before:	-		Clarity Before:	_	<del></del>		Texture:	
After:			Clarity After:	_			Artifacts:	_
ments:		TO EOD OLLED	E CD 4					
ופוט	OLVED_MEIA	ALS_FOR_SAMPL	.c_or-4					

FORM I - IN

### 3 BLANKS

Lab Name:	MITKEM_CORI	PORATION	_	Contract:			
Lab Code:	MITKEM	Case No.:		SAS No.:		SDG No.:	90103
Preparation Bla	nk Matrix (soil/wa	ter):		WATER			
Preparation Bla	nk Concentration U	Jnits (ug/L or mg/kg)	:		UG/L		

	Initial Calib. Blank		Continuing Calibration Blank (ug/L)						Prepa- ration		
Analyte	(ug/L)	С	1	С	2	С	3	С	Blank	С	N
Aluminum											
Antimony										<u> </u>	
_Arsenic											
Barium									_		
Beryllium							_				<u> </u>
_Cadmium											
_Calcium											
_Chromium											$\perp$
_Cobalt											<u> </u>
_Copper											ļ
Iron	25.0	U	25.0	U	25.0	U	25.0	U_	132.502	B_	P
Lead											_
Magnesium											
Manganese	_										
Mercury											
Nickel											
Potassium	<u>.</u>										$\perp$
Selenium			·····								↓
_Silver								$\perp$			<u> </u>
_Sodium	<del> </del>										-
Thallium	<u> </u>					$\perp$					
Vanadium											
_Zinc	<u> </u>							$\perp$		_	₩.
.Cyanide											

# 3 BLANKS

Lab Name:	MITKEM_CORPOR	ATION	<del>-</del>	Contract:			
Lab Code:	MITKEM	Case No.:		SAS No.:		SDG No.:	90103
Preparation Bla	nk Matrix (soil/water):			WATER			
Preparation Bla	nk Concentration Unit	s (ug/L or mg/kg)	):		UG/L		

	Initial Calib. Blank		Continuing Calibration Blank (ug/L)						Prepa- ration		
Analyte	(ug/L)	С	1	С	2	С	3	С	Blank	C	M
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium	!										
Cobalt											
Copper							<b>-</b> ,				
Iron			25.0	U					45.101	B_	P
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

FORM III - IN

# 7 LABORATORY CONTROL SAMPLE

Lab Name:	MITKEM_C	ORPORATION	Contract:	-		
Lab Code:	MITKEM	Case No.:	 SAS No.:	<del></del>	SDG No.:	90103
Solid LCS Sou	irce:					
Aqueous LCS	Source:	HIGH_PURITY_				

	Aqu	ieous (ug/L)				Solid (r	ng/kg)	
Analyte	True	Found	%R	True	Found	C	Limits	%R
Aluminum								
_Antimony								
_Arsenic								
Barium								
Beryllium								, e
Cadmium								
_Calcium								
Chromium_								
_Cobalt								
_Copper								
Iron	4550.0	4293.5	94.4					
Lead								
Magnesium								
_Manganese								
_Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium				-				
Zinc			1.					
Cyanide								

FORM VII - IN

# 9 ICP SERIAL DILUTIONS

<b>EPA</b>	C.	Aλ	TON	С	NO	
CIA	27	77)	шι	æ	NU	١,

					SP-4L	
Lab Name:	MITKEM_C	ORPORATION_	 Contract	:		
Lab Code:	MITKEM	Case No.:	 SAS No.:		SDG No.:	90103
Matrix (soil/w	ater):	WATER_		Leve	l (low/med):	MED

# Concentration Units: ug/L

Analyte	Initial Sample Result (I)	С	Serial Dilution Result (S)	C	% Differ- ence	Q	M
Aluminum							_NR
Antimony							NR
Arsenic							_NR
Barium_							_NR
Beryllium							_NR
Cadmium							_NR
Calcium							_NR
Chromium							_NR
Cobalt							_NR
.Copper							_NR
Iron	1814.94		2007.10		10.6	LE	_P_
Lead							_NR
Magnesium							_NR
Manganese							_NR
Mercury							_NR
Nickel							_NR
Potassium							_NR
Selenium							_NR
Silver							_NR
Sodium							_NR
Thallium					_		_NR
Vanadium							_NR
Zinc	<u> </u>						_NR

# MITKEM Corporation

\* Wet Chemistry \*



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

SP-1

Lab ID:

90103001

		Reporting		Analysis	Analysis
<u>Analyte</u>	<u>Results</u>		<u>Units</u>	<u>Method</u>	<u>Date</u>
	40	40		014 4500 0000	4 (05 (00
Free CO2	19	10	mg/L	SM 4500-CO2C	1/25/02
Nitrate/Nitrate-N	0.16	0.05	mg/L	EPA 353.2	1/25/02
Sulfates	46	7	mg/L	SM 4500-SO4 E	1/25/02
TOC	17	6	mg/L	EPA 415.1	1/26/02

Page 1 of 1



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

SP-2

Lab ID:

90103002

		1	Reporting		Analysis	Analysis
_	<u>Analyte</u>	Results		<u>Units</u>	Method	<u>Date</u>
	Free CO2	42	10	mg/L	SM 4500-CO2C	1/25/02
_	Nitrate/Nitrate-N	0.10	0.05	mg/L	EPA 353.2	1/25/02
	Sulfates	64	7	mg/L	SM 4500-SO4 E	1/25/02
	TOC	29	6	mg/L	EPA 415.1	1/26/02

Page 1 of 1



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

SP-3

Lab ID:

90103003

		Reporting		Analysis	Analysis
<u>Analyte</u>	Results		<u>Units</u>	Method	<u>Date</u>
Free CO2	11	10	mg/L	SM 4500-CO2C	1/25/02
Nitrate/Nitrate-N	0.10	0.05	mg/L	EPA 353.2	1/25/02
Sulfates	16	7	mg/L	SM 4500-SO4 E	1/25/02
TOC	18	6	mg/L	EPA 415.1	1/26/02

Page 1 of 1



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

SP-4

Lab ID:

90103004

1			Reporting			Analysis	Analysis
	Analyte	Results			<u>Units</u>	Method	<u>Date</u>
6	Free CO2	24	10		mg/L	SM 4500-CO2C	1/25/02
	Nitrate/Nitrate-N	ND	5	*	mg/L	EPA 353.2	1/25/02
	Sulfates	22	7		mg/L	SM 4500-SO4 E	1/25/02
	TOC	24	6		mg/L	EPA 415.1	1/26/02

ND = Not Detected

\*Elevated due to sample matrix effects.

Page 1 of 1



Client: Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

Lab ID: Method Blank

			Reporting		Analysis	Analysis
	<u>Analyte</u>	Results		<u>Units</u>	Method	<u>Date</u>
•	Free CO2	ND	10	mg/L	SM 4500-CO2C	1/25/02
	Nitrate/Nitrate-N	ND	0.05	mg/L	EPA 353.2	1/25/02
	Sulfates	ND	7	mg/L	SM 4500-SO4 E	1/25/02
	TOC	ND	6	mg/L	EPA 415.1	1/26/02

ND = Not Detected

Page 1 of 1 90103-MB



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

Lab ID:

Lab Control Sample

Method Date	% Recovery	<u>Analyte</u>
SM 4500-CO2C 1/25/02	105	Free CO2
EPA 353.2 1/25/02	95	Nitrate/Nitrate-N
SM 4500-SO4 E 1/25/02	100	Sulfates
EPA 415.1 1/26/02	88	TOC
SM 4500-CO2C 1. EPA 353.2 1. SM 4500-SO4 E 1.	105 95 100	Free CO2 Nitrate/Nitrate-N Sulfates

Page 1 of 1

90103-LCS

003;

Last Page of Data Report

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February 22, 2002

LMS Engineering One Blue Hill Plaza, PO Box 150 Pearl River, NY 10965 Attn: Ms. Maria Heincz

RE: Client Project: Harrison Spill Site, 446-311 Mitkem Lab Project # 90091

Dear Ms. Heincz:

Enclosed please find the data report of the required analysis for the samples associated with the above referenced project.

If you have any questions regarding this report, please call me.

We appreciate your business

Sincerely,

Environmental Chamistry Section

FEB 2 7 2002

Agnes R. Ng
CLP Project Manager

# New York State Department of Environmental Conservation Sample Identification and Analytical Requirements Summary

Project Name: Harrison Spill Site 446-311 SDG: 96091

			A	nalytical Req	uirements	
		VOA	BNA	Pest		
Customer	Laboratory	GC/MS	GC/MS	PCBs		
Sample Code	Sample Code	Method #	Method #	Method #	<u>Metals</u>	<u>Other</u>
						Net Chem
I-WA	90091001	&160B			6010B	seedata
MW-2	602					
MW-3	003					
MW-4	004					
MW-5	005					
MW-6	006					
MW-7	007					
MW-8	DOS					
MW-9	009					1
TRIPBLANK	1 010	J.				

# New York State Department of Environmental Conservation

# Sample Preparation and Analyses Summary Volatile (VOA) Analyses

Project Name: Harrison Spill Site 446:311 SDG: 9009/

Laboratory Sample ID	<u>Matrix</u>	Date <u>Collected</u>	Date Received <u>at Lab</u>	Date Extracted	Date <u>Analyzed</u>
90091001	001 AQ 1/23		124102	N/A	1/26/02
002					1
603					
104					
005					
006					
007					
008					
109					
1 010		4	V	- Characteristics	<b>√</b>

# New York State Department of Environmental Conservation

# Sample Preparation and Analyses Summary Volatile (VOA) Analyses

Project Name: Harrison Spill Site 446-311 SDG: 90091

Laboratory Sample ID	Matrix	Analytical <u>Protocol</u>	Extraction <u>Method</u>	Low/Med. <u>Level</u>	Dil./Conc. Factor
90091001	Aa	82608	N. A	Low	_
002					
003					
004				_	
005					
000					
007					
008					
٩٧٥					
010	V	9	j	V	J
*					

# New York State Department of Environmental Conservation

# Sample Preparation and Analyses Summary Inorganic Analyses

Project Name: Harrison Spill Site 446-511

SDG: 90091

Laboratory Sample ID	<u>Matrix</u>	Metals Requested	Date Received at Lab	Date <u>Analyzed</u>
10011001	AQ	6010B	1/24/02	1/25/02 1/24/02
002				
003				
004				
105				
006				
007				
008				
109	<b>*</b>	<u> </u>	y	d
	-			

# Analytical Data Package for LMS Engineers

Client Project: Harrison Spill Site, 446-311

SDG# 90091

Mitkem Project ID: 90091

February 22, 2002

#### **SDG Narrative**

Mitkem Corporation submits the enclosed data package in response to LMS Engineers' Harrison Spill Site project number 446-311. Under this deliverable, analysis results are presented for ten aqueous samples that were received on January 4 2002 and assigned Laboratory Number 90091. Analyses were performed per specifications in the project's contract and the chain of custody forms.

The following samples are submitted in this data package:

Client ID	Lab ID	Analysis
MW-1	90091001	$\overline{V}$ , $\overline{M}$ . $\overline{D}$ M, N, F, S, T
MW-2	90091002	V, M. DM, N, F, S, T
MW-3	90091003	V, M. DM, N, F, S, T
MW-4	90091004	V, M. DM, N, F, S, T
MW-5	90091005	V, M. DM, N, F, S, T
MW-6	90091006	V, M. DM, N, F, S, T
MW-7	90091007	V, M. DM, N, F, S, T
MW-8	90091008	V, M. DM, N, F, S, T
MW-9	90091009	V, M. DM, N, F, S, T
TRIPBLANK	90091010	V

V = Volatile Organics – NYSDEC ASP Method 8260B

M = Iron - NYSDEC ASP Method 6010B

DM = Dissolved Iron - NYSDEC ASP Method 6010B

N = Nitrate - EPA 353.2

F = Free CO2 - SM 4500-CO2 C

S = Sulfates - SM 4500-SO4 E

T = Total Organic Carbon - EPA 415.1

The analyses were performed according to NYSDEC ASP protocols (October 1995 update) and reported per NYSDEC ASP requirement for Category A deliverable with the exception of nitrate, free CO2, sulfates and total organic carbon. Nitrate, free CO2, sulfates and total organic carbon are reported in the standard Mitkem format.

The following observation and/or deviations are observed for the following analyses:

#### 1. Overall Observation:

Where needed, manual integrations were performed to improve data quality. The corrections were reviewed and associated hardcopies generated and reported as required.

#### 2. Volatile Organic Analysis:

Sample results are reported to a nominal 1ppb level. These reporting limits are below the lowest initial calibration standard, but above laboratory method detection limits.

Surrogate recovery: recoveries were within the QC limits.

Lab control sample: spike recoveries were within the QC limits.

Sample analysis: no unusual observation was made for the analyses.

#### 3. Metals Analysis:

The metals analysis includes results for both total and dissolved iron. The total iron analysis has the letter "T" preceding the laboratory identification number and the dissolved iron analysis has the letter "D" preceding the laboratory identification number.

Lab control sample: spike recoveries were within the QC limits.

Sample analysis: no unusual observation was made for the analyses.

#### 4. Wet Chemistry Analysis:

The reporting limit for nitrate in several samples was elevated due to sample matrix interference. This analysis involves the generation of a color, which is proportional to the concentration of the analyte in the sample. Without dilution, the color of the sample obscured the color change in the analysis.

For the free carbon dioxide analysis, sample MW-9 turned pink upon addition of the indicator. The analyst proceeded with a 20x dilution and 100x dilution with similar results. The sample was able to be titrated at 200x dilution.

No other unusual observation was made for the analyses.

The pages in this report have been numbered consecutively, starting from this narrative and ending with a page saying only "Last Page of Data Report".

I certify that this data package is in compliance, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this

hardcopy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Agnes Ng
CLP Project Manager

02/22/02

Sample Transmittal Documentation

	Lax /	TURNAROUND TIME	A diz	. TO THE THE WALL VOICE		TO SALLON SOLO SOLO SOLO SOLO SOLO SOLO SOLO	111111		CDCR			2000							DATE/TIME ADDITIONAL REMARKS: COOLER TEMP:	The 1/3462 1 CHO * To be greater hed of 6°C	ferring to the Co	)	YELLOW: REPORT COPY PINK: CLIENT'S COPY
OMP	NAME	ADDRESS	CITY/ST/ZIP			OF CONTAINERS	8								<u> </u>			1	ED BY	HIN			ELLOW:
16 47) 1. S.M.	79/1-582 (Shaha			CLIENT P.O.#:		LAB ID	90080-11	1, -0,2	Cρ-	1,6-	50-1	-00-	1-0-	\$0-	N 20-1	100- X			() ACCEPTED BY	ala historia			
, B	25		25			ОТНЕК	ļ									$\sum$				1			WHITE: LABORATORY COPY
	F		0950	CT #:	11E-7H	SOIL	<u> </u>										<u></u>						RATOI
(%)			, ,	CLIÉNT PROJECT#:	2	жатек	7								>		$\Delta$		DATE/TIME	20/82/	_		LABO
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". 115K T. Kell	5 INOZ	ine Hill 1	i River		111 SITE	DATE/TIME SAMPLED	1/23/02/1	3HS11	1600	1615	1/625	1700	1645	11115	11725	136		' /	RELINQUISHED BY	der			
THE SANY AND SELECT OF STATE O	NAME MARCIA HEINCE	ADDRESS ONE BLUE HILL	CITYISTIZIP PEAKCI RIVER	CLIENT PROJECT NAME:	HARRISON SPITSITE	SAMPLE	MW-1	11111-2	MW-3	mw-4	MW-5	MW-6	Mw-7	8-MW	MW-9	1 Trip Black			TSF# RELINQU	1 J. Selsie	<u>~</u>	005	5

90091
Vorkorder #:
Lab V

		•	•						
01/24/02	01/24/02 07:03 PM			Page 3 of 3	KLOKAI	Original			
<u>Lab ID</u> <u>Client ID</u> 90091009 MW-9		<u>Matrix</u> W	<u>Type</u> SAMPLE	<u>Analysis Code</u> 8260W S4500EWSO4 S4500WFCO2	Collected	Received	Due	<u>Notes</u>	
90091010 TRIPBLANK	UPBLANK	*	B-TB	8260W	01/23/02 17:25 01/24/02	01/24/02	02/01/02		
90091011 MW-1	W-1	≽	SAMPLE	6010W Fe 6010W PREP	01/23/02 15:20	01/24/02	02/01/02	DISS FE	
90091012 MW-2	W-2	≽	SAMPLE	6010W Fc 6010W PREP	01/23/02 15:40 01/24/02	01/24/02	02/07/02	DISS FE	
90091013 MW-3	W-3	≽	SAMPLE	6010W Fe 6010W PREP	01/23/02 16:00	01/24/02	02/07/02	DISS FE	
90091014 MW-4	W-4	≥	SAMPLE	6010W Fe 6010W PREP	01/23/02 16:15	01/24/02	02/07/02	DISS FE	
90091015 MW-5	W-5	≱	SAMPLE	6010W Fe 6010W PREP	01/23/02 16:25	01/24/02	02/01/02	DISS FE	
90091016 MW-6	N-6	» ≽	SAMPLE	6010W Fe 6010W PREP	01/23/02 17:00	01/24/02	02/01/02	DISS FE	
90091017 MW-7	7-N	». ≽	SAMPLE	6010W Fe 6010W PREP	01/23/02 16:45	01/24/02	02/01/02	DISS FE	
90091018 MW-8	٧-8	» ≽	SAMPLE	6010W Fe 6010W PREP	01/23/02 17:15	01/24/02	02/01/02	DISS FE	
90091019 MW-9	6-7	⊗	SAMPLE (	6010W Fc 6010W PREP	01/23/02 17:25	01/24/02	02/07/02 DISS FE	DISS FE	

# INVOICE AND REPORT GO TO:

Maria Heincz Lawler, Matusky & Skelly Eng. One Blue Hill Plz, PO Box 150 Pearl River, NY, 10965 E-Mail: mheincz@lmseng.com W: 845-735-8300 F: 845-735-7466

# MITKEM CORPORATION

Sample Condition Form Page\_of\_ MITKEM Project Reviewed By: Received By: Client: Client Project: Comments/Remarks/ VOA Preservation (pH) HNO3 H2SO4 HCI NaO Corrective Action\* Lab Sample ID Matrix Condition: 710 1) Custody Seal(s) Present Absent CHE Coolers/Bottles 703 Intact/Broken -04 2) Custody Seal Number(s) -05 -06 Present Absent 3) Chain-of-Custody 600 -07 4) Cooler Temperature - OS Coolant Condition - 09 PresentAbsent 5) Airbill(s) - 010 8257 4014 2979 Airbill Number(s) 6) Sample Bottles Broken Leaking 7) Date Received 8) Time Received VOA Matrix Key: US=Unpreserved Soil M-=MeOH UA=Unpreserved Aqueous E=Encore MN=MeOH & NaHSO4 H≈HCI N=NaHSO4 A=Air

<sup>\*</sup> See Sample Condition Notification/Corrective Action Form yes / ne

# MITKE M Corporation

\* Volatiles \*

# 1A VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

•	Lab Name: MITKEM CORPO	ORATION Contr	act:	VZALCS	
	Lab Code: MITKEM Ca	ase No.: SAS	No.: SDG	No.: 90091	
1	Matrix: (soil/water) W	VATER	Lab Sample ID	: V2L0126A	
	Sample wt/vol: 5	5.000 (g/mL) ML	Lab File ID:	V2E7774	
	Level: (low/med) L	LOW	Date Received	:	
	% Moisture: not dec		Date Analyzed	: 01/26/02	
•	GC Column: DB-624	ID: 0.25 (mm)	Dilution Fact	or: 1.0	
	Soil Extract Volume:	(uL)	Soil Aliquot	Volume:(ı	ıL)
	CAS NO.		NCENTRATION UNITS g/L or ug/Kg) UG/		
•		Methyl tert-butyl e	ther	46	
t	71-43-2 108-88-3 100-41-4 1330-20-7 91-20-3	Toluene Ethylbenzene Xylene (Total)		47 48 47 150 42	

•	Lab Name: MITKEM CORPORATION	Contract:	
	Lab Code: MITKEM Case No.:	SAS No.:	SDG No.: 90091
,	Matrix: (soil/water) WATER	Lab Sar	mple ID: V2B0126A
	Sample wt/vol: 5.000 (g/r	Lab Fi	le ID: V2E7773
	Level: (low/med) LOW	Date Re	eceived:
	% Moisture: not dec.	Date A	nalyzed: 01/26/02
b	GC Column: DB-624 ID: 0.25	(mm) Dilutio	on Factor: 1.0
_	Soil Extract Volume:(u	Soil A	liquot Volume:(uL
•	CAS NO. COMPOUNT	CONCENTRATION (ug/L or ug/	
i.	1634-04-4Methyl 71-43-2Benzene 108-88-3Toluene 100-41-4Ethylbe 1330-20-7Xylene 91-20-3Naphtha	nzene (Total)	1 U 1 U 1 U 1 U 1 U

#### 2A WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: 90091

٠ .		01/01	G1 (GO	G1 (G1)	0	mom I
	EPA	SMC1	SMC2	SMC3	OTHER	TOT
	SAMPLE NO.	#	(DCE)#	(TOL)#	(BFB)#	OUT
	==========	======	======	=====	======	===
01	VBLK2A	90	82	97	104	0
02	V2ALCS	99	98	95	105	0
03	MW-1	89	86	95	105	0
04	MW-2	87	85	101	108	0
05	MW-3	82	79	107	109	0
06	MW-4	89	81	96	108	0
07	MW-5	90	82	102	106	0
80	MW-6	88	82	102	110	0
09	MW-7	89	82	102	111	0
10	MW-8	89	83	102	113	0
11	MW-9	90	83	96	107	0
12	TRIPBLANK	90	84	96	106	0
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SMC1 = Dibromofluoromethane (79-122) SMC2 (DCE) = 1,2-Dichloroethane-d4 (76-121) SMC3 (TOL) = Toluene-d8 (82-118) OTHER(BFB) = Bromofluorobenzene (85-120)

- # Column to be used to flag recovery values
- \* Values outside of contract required QC limits
- D System Monitoring Compound diluted out

page 1 of 1

FORM II VOA-1

## FORM 3 WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: MITKEM CORPORATION

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: 90091

Matrix Spike - Sample No.: V2ALCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Methyl tert-butyl ether Benzene Toluene Ethylbenzene	50 50 50 50		46 47 48 47	92 94 96 94	62-136 78-121 77-122 76-120
Xylene (Total) Naphthalene	150 50		150 42	100 84	76-121 52-137

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 0 outside limits Spike Recovery: 0 out of 6 outside limits

COMMENTS:	

Lab Name: MITKEM CORPORATION

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: 90091

Lab File ID: V2E7773

Lab Sample ID: V2B0126A

Date Analyzed: 01/26/02

Time Analyzed: 1051

GC Column: DB-624 ID: 0.25 (mm)

Heated Purge: (Y/N) N

Instrument ID: V2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA	LAB	LAB	TIME
	SAMPLE NO.	SAMPLE ID	FILE ID	ANALYZED
	=========	=======================================	==========	========
01	V2ALCS	V2L0126A	V2E7774	1210
02	MW-1	90091001	V2E7777	1530
03	MW-2	90091002	V2E7778	1558
04	MW-3	90091003	V2E7779	1626
05	MW-4	90091004	V2E7780	1654
06	MW-5	90091005	V2E7781	1721
07	MW-6	90091006	V2E7782	1749
	MW-7	90091007	V2E7783	1817
09	MW-8	90091008	V2E7784	1845
10	MW-9	90091009	V2E7785	1912
11	TRIPBLANK	90091010	V2E7786	1940
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COMMENTS:				
-		_		

page 1 of 1

FORM IV VOA

# MITKEM CORPORATION

\* Metals \*

)	Lab Name: MITKEM CORPORATION	Contract:
	Lab Code: MITKEM Case No.:	SAS No.: SDG No.: 90091
ı	Matrix: (soil/water) WATER	Lab Sample ID: 90091001
	Sample wt/vol: 5.000 (g/mL) ML	Lab File ID: V2E7777
i	Level: (low/med) LOW	Date Received: 01/24/02
	% Moisture: not dec.	Date Analyzed: 01/26/02
)	GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
	Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)
•	CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q
•	1634-04-4Methyl tert-k 71-43-2Benzene	1 U
ì	108-88-3Toluene 100-41-4Ethylbenzene 1330-20-7Xylene (Total 91-20-3Naphthalene	1 U 1 U 1 U 1 U

# VOLATILE ORGANICS ANALYSIS DATA SHEET

ı	Lab Name: MITKEM CORPORATION Contract:	MM-2	
	Lab Code: MITKEM Case No.: SAS No.:	SDG No.: 90091	
ı	Matrix: (soil/water) WATER Lab Sam	mple ID: 90091002	
	Sample wt/vol: 5.000 (g/mL) ML Lab File	Le ID: V2E7778	
t	Level: (low/med) LOW Date Re	eceived: 01/24/02	
	% Moisture: not dec Date An	nalyzed: 01/26/02	
1	GC Column: DB-624 ID: 0.25 (mm) Dilutio	on Factor: 1.0	
_	Soil Extract Volume:(uL) Soil Al	liquot Volume:	(uL)
•	CONCENTRATION CAS NO. COMPOUND (ug/L or ug/K		
	1634-04-4Methyl tert-butyl ether	1 U 1 U 1 U 1 U 1 U 1 U	

	Lab Na	me: MITKEM COR	PORATION	Contract:		<del></del>	
	Lab Co	ode: MITKEM	Case No.:	SAS No.:	SDG No.:	90091	
	Matrix	: (soil/water)	WATER	Lab Samp	ole ID: 9009	1003	
	Sample	wt/vol:	5.000 (g/mL) ML	Lab File	ID: V2E7	7779	
	Level:	(low/med)	LOW	Date Rec	eived: 01/2	4/02	
	% Mois	sture: not dec.		Date Ana	alyzed: 01/2	6/02	
	GC Col	lumn: DB-624	ID: 0.25 (mm)	Dilution	Factor: 1.	. 0	
	Soil E	Extract Volume:	(uL)	Soil Ali	iquot Volume	e:	(uL)
		CAS NO.	COMPOUND	CONCENTRATION (ug/L or ug/Kg		Q	
			Methyl tert-b	utyl ether	1	LU	
l		1330-20-7		)	3 4( 11(		

Lab Name: MITKEM CORPORATION	Contract:	MW-4	
Lab Code: MITKEM Case No.:	SAS No.: SDG	No.: 90091	
Matrix: (soil/water) WATER	Lab Sample ID:	90091004	
Sample wt/vol: 5.000 (g/mL) ML	Lab File ID:	V2E7780	
Level: (low/med) LOW	Date Received	: 01/24/02	
% Moisture: not dec	Date Analyzed	: 01/26/02	
GC Column: DB-624 ID: 0.25 (mm)	Dilution Facto	or: 1.0	
Soil Extract Volume:(uL)	Soil Aliquot V	Volume:	(սԼ)
CAS NO. COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/		
1634-04-4Methyl tert-b 71-43-2Benzene 108-88-3Toluene 100-41-4Ethylbenzene		1 U 1 U 1 U 1 U 1 U	
1330-20-7Xylene (Total		1 U	

	Lab Name: MITH	KEM CORPORATION	Contract:		
	Lab Code: MITT	KEM Case No.:	SAS No.:	SDG No.: 9	00091
	Matrix: (soil,	/water) WATER	Lab Sa	mple ID: 90091	.005
	Sample wt/vol	: 5.000 (g/mL)	ML Lab Fi	le ID: V2E77	781
	Level: (low,	/med) LOW	Date R	eceived: 01/24	1/02
	% Moisture: no	ot dec	Date A	nalyzed: 01/26	5/02
ı	GC Column: DB	-624 ID: 0.25 (m	m) Diluti	on Factor: 1.0	)
	Soil Extract	Volume:(uL)	Soil A	liquot Volume:	:(uL
	CAS NO	. COMPOUND	CONCENTRATIO (ug/L or ug/		Q
	71-43-	4-4Methyl ter 2Benzene -3Toluene	t-butyl ether	1 1 1	U U
1	100-41 1330-2	-4Ethylbenze 0-7Xylene (To 3Naphthalen	tal)	1 4 1	<del>0</del>

	Lab Name: MITKEM CORPORATION	Contract:	
	Lab Code: MITKEM Case No.:	SAS No.: SDG No.: 90091	
١	Matrix: (soil/water) WATER	Lab Sample ID: 90091006	
	Sample wt/vol: 5.000 (g/mL) MI	Lab File ID: V2E7782	
i	Level: (low/med) LOW	Date Received: 01/24/02	
	% Moisture: not dec	Date Analyzed: 01/26/02	
ł	GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0	
	Soil Extract Volume:(uL)	Soil Aliquot Volume:	_(uL
	CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q	
1	1634-04-4Methyl tert-1 71-43-2Benzene 108-88-3Toluene	butyl ether 1 U U U I U U I U U I U I U I U I U I U	
	100-41-4Ethylbenzene 1330-20-7Xylene (Tota 91-20-3Naphthalene		

1A VOLATILE ORGANICS ANALYSIS DATA SHEET

	Lab Name: MITKEM CORPORATION	Contract:	MM - /
	Lab Code: MITKEM Case No.:	SAS No.: SDG	No.: 90091
	Matrix: (soil/water) WATER	Lab Sample ID:	90091007
	Sample wt/vol: 5.000 (g/mL) M	L Lab File ID:	V2E7783
	Level: (low/med) LOW	Date Received:	01/24/02
	% Moisture: not dec	Date Analyzed:	01/26/02
	GC Column: DB-624 ID: 0.25 (mm)	Dilution Facto	or: 1.0
	Soil Extract Volume:(uL)	Soil Aliquot V	/olume:(uL
	CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/I	
	1634-04-4Methyl tert- 71-43-2Benzene 108-88-3Toluene	butyl ether	1 U 1 U 1 U
•	100-41-4Ethylbenzene 1330-20-7Xylene (Tota 91-20-3Naphthalene	1)	1 U 1 U 1 U 1 U 1 U 1 U

1	Lab Na	me: MITKEM COR	PORATION	Contract:		
	Lab Co	de: MITKEM	Case No.:	SAS No.:	SDG No.: 90091	
١	Matrix	: (soil/water)	WATER	Lab Samp	le ID: 90091008	
	Sample	wt/vol:	5.000 (g/mL) ML	Lab File	ID: V2E7784	
•	Level:	(low/med)	LOW	Date Rec	eived: 01/24/02	
	% Mois	sture: not dec.		Date Ana	lyzed: 01/26/02	
)	GC Col	umn: DB-624	ID: 0.25 (mm)	Dilution	Factor: 1.0	
_	Soil E	extract Volume:	(uL)	Soil Ali	quot Volume:	(uL)
•		CAS NO.	COMPOUND	CONCENTRATION (ug/L or ug/Kg		
1		71-43-2 108-88-3	Toluene	utyl ether	1 U 1 U 1 U	
		1330-20-7	Ethylbenzene Xylene (Total	)	1 U	

Lab Na	me: MITKEM COR	PORATION	Contract:		MW-9 	
Lab Co	ode: MITKEM	Case No.:	SAS No.:	SDG No.:	90091	
Matrix	: (soil/water)	WATER	Lab Sa	mple ID: 9009	91009	
Sample	wt/vol:	5.000 (g/mL) ML	Lab Fi	le ID: V2E7	7785	
Level:	(low/med)	LOW	Date R	eceived: 01/2	24/02	
% Mois	sture: not dec.		Date A	nalyzed: 01/2	26/02	
GC Col	umn: DB-624	ID: 0.25 (mm)	Diluti	on Factor: 1	. 0	
Soil E	Extract Volume:	(uL)	Soil A	liquot Volume	e:	(uL)
	CAS NO.	COMPOUND	CONCENTRATIO		Q	
	71-43-2 108-88-3 100-41-4 1330-20-7				1 U 1 U 1 U 1 U 1 U	

i	Lab Name: MITKEM CORPORATION	Contract:
	Lab Code: MITKEM Case No.:	SAS No.: SDG No.: 90091
l.	Matrix: (soil/water) WATER	Lab Sample ID: 90091010
	Sample wt/vol: 5.000 (g/mL) ML	Lab File ID: V2E7786
)	Level: (low/med) LOW	Date Received: 01/24/02
	% Moisture: not dec	Date Analyzed: 01/26/02
1	GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
	Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL
	CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q
•	1634-04-4Methyl tert-b 71-43-2Benzene	1 0
•	108-88-3Toluene 100-41-4Ethylbenzene 1330-20-7Xylene (Total	1 U

#### 1 EPA SAMPLE NO. INORGANIC ANALYSIS DATA SHEET MW-1 ) Name: MITKEM\_CORPORATION\_\_\_\_\_ Contract: ab Code: MITKEM Case No.: SAS No.: SDG No.: 90091\_\_\_\_ trix (soil/water): WATER\_ Lab Sample ID: T90091001\_\_\_\_ Level (low/med): MED\_\_\_\_ Date Received: 01/24/02\_\_\_\_ Solids: Concentration Units (ug/L or mg/kg dry weight): UG/L C CAS No. Analyte Concentration Q M 7429-90-5 Aluminum\_ NR Antimony\_ 7440-36-0\_ NR 7440-38-2\_ Arsenic\_\_ NR NR Barium\_ \_7440-39-3\_ NR \_7440-41-7\_ Beryllium\_ NR 7440-43-9 Cadmium\_ 7440-70-2\_ Calcium NR .Chromium\_ NR. \_7440-47-3\_ Cobalt\_ NR \_7440-48-4\_ Copper\_\_\_ NR \_7440-50-8\_ \_7439-89-6\_ Iron\_ 3760\_ P. NR Lead\_ \_7439-92-1\_ \_7439-95-4\_ Magnesium\_ NR Manganese\_ NR \_7439-96-5\_ 7439-97-6\_ Mercury\_ NR 7440-02-0\_ NR \_Nickel\_ NR \_7440-09-7\_ Potassium\_ NR 7782-49-2\_ Selenium\_ \_7440-22-4\_ Silver NR \_Sodium\_ NR. \_7440-23-5\_ Thallium NR. \_7440-28-0\_ NR. \_7440-62-2\_ Vanadium\_ \_7440-66-6\_ Zinc NR .Cyanide\_ NR lor Before: Clarity Before: Texture: Color After: Clarity After: Artifacts: Comments:

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							MW-	-1
e:	MITKEM_CO	ORPORATION	Contra	act:				
<b>:</b> :	MITKEM	Case No.:	S.	AS No.	:		SDG No.:	90091_
oil/w	vater):	WATER_			Lab Samp	le ID:	D90091	001
w/me	ed):	MED			Date Rece	ived:	01/24/02	2
:								
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L	
	CAS No.	Analyte	Concentration	С	Q	M		
	_7429-90-5	Aluminum				NR		
	_7440-36-0					NR		
	_7440-38-2					NR		
	_7440-39-3	Barium				NR		
	_7440-41-7	Beryllium		-+-		NR		
	_7440-43-9	Cadmium				NR		
	7440-70-2	Calcium				NR		
	7440-47-3	Chromium				NR		
	_7440-48-4	Cobalt				NR		
	_7440-50-8	Copper				NR		
	_7439-89-6	Iron	298			P		
	_7439-92-1	Lead		_		NR		
	_7439-95-4	Magnesium				NR		
	_7439-96-5	Manganese				NR		
	_7439-97 <b>-</b> 6	Mercury				NR		
	_7440-02-0	Nickel		_		NR		
	_7440-09-7	Potassium				NR		
	_7782-49-2	Selenium		$\dashv$		NR		
	_7440-22-4	Silver				NR		
	_7440-23-5	Sodium				NR		
	_7440-28-0	Thallium				NR.		
	_7440-62-2	Vanadium				NR		
	_7440-66-6	Zinc			_	NR		
		Cyanide				NR.		
•			<b></b>				_	
fore			Clarity Before:	_			Texture:	-
ter:			Clarity After:				Artifacts:	

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EPA	SAN	12L	Æ	NO	١.

							MW-2
ame:	MITKEM_CO	DRPORATION	Cont	ract:	- "		
Code:	MITKEM	Case No.:		SAS No.:		_	SDG No.: 90091_
x (soil/wa	ater):	WATER_			Lab Sampl	e ID:	T90091002
(low/me	d):	MED			Date Recei	ived:	01/24/02
lids:							
	Concentration	Units (ug/L or mg/	kg dry weight):				UG/L
	CACN	A	Commention				
	CAS No.	Analyte	Concentration	C	Q	M	
	_7429-90-5	Aluminum				NR	
	_7440-36-0	Antimony				NR	
	_7440-38-2	Arsenic				NR	
	_7440-39-3	Barium				NR	
	_7440-41-7	Beryllium				NR	
	_7440-43-9	Cadmium				NR	
	_7440-70-2	Calcium				NR	
	_7440-47-3	Chromium				NR	
	_7440-48-4	Cobalt				NR	
	_7440-50-8	Copper				NR	
	7439-89-6	Iron	75600				
	7439-92-1	Lead	75000			NR	
	7439-95-4	Magnesium				NR	
	_7439-96-5	Manganese				NR	
	_7439-97-6	Mercury				NR	
	_7440-02-0	Nickel				NR	
	_7440-09-7	Potassium				NR	
	7782-49-2	Selenium				NR	
	_7440-22-4	Silver				NR	
	_7440-23-5	Sodium				NR	
	_7440-28-0	Thallium				NR	
					-		
		Vanadium Zinc Cyanide				NR NR NR	
Before:			Clarity Before:				Texture:
After:			Clarity After:	_	_		Artifacts:
ments:							
ments:							
•			_ <del>_</del>		_		

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me:	MITKEM_CO	DRPORATION	Contra	act:			MW-2
de:	MITKEM	Case No.:	S	AS No.:	•		SDG No.: 90091
	1111 1 1 1 1 1 1 1	0.00011011			. —		5501.0 70071
x (soil/w	vater):	WATER_			Lab Samp	le ID:	D90091002
(low/me	ed):	MED			Date Rece	ived:	01/24/02
lids:							
	Concentration	Units (ug/L or mg.	/kg dry weight):				UG/L
			<del>-</del>	1		-T1	
	G. G.Y				_		
	CAS No.	Analyte	Concentration	C	Q	M	
	_7429-90-5	Aluminum				NR	
	7440-36-0	Antimony				NR	
	_7440-38-2	Arsenic				NR	
	_7440-39-3	Barium				NR	
	7440-41-7	Beryllium				NR	
	_7440-43-9	Cadmium				NR.	
	_7440-70-2	Calcium				NR	
	_7440-47-3	Chromium				NR	
	_7440-48-4	Cobalt				NR	
	_7440-50-8	Copper				NR	
	7439-89-6	Iron	4240			P	•
	_7439-92-1	Lead				NR	
	_7439-95-4	Magnesium				NR	
	_7439-96-5	Manganese				_NR	
	_7439-97-6	Mercury	·			NR	
	_7440-02-0	Nickel				NR	
	_7440-09-7	Potassium				NR	
	_7782-49-2	Selenium				NR	
	_7440-22-4	Silver				NR	
	_7440-23-5	Sodium				NR	
	_7440-28-0					NR	
		Vanadium				NR	
	_7440-62-2			1 1		NR	
	_7440-62-2 _7440-66-6	ZincCyanide				NR	

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	_	ORPORATION		ntract:			GD G 11
	MITKEM	Case No.:		SAS No	·.:		SDG No.: 9009
il/w	ater):	WATER_			Lab Samp	ole ID:	T90091003
//me	d):	MED			Date Rece	eived:	01/24/02
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L
	CAS No.	Analyte	Concentration	С	Q	M	
	_7429-90-5	Aluminum				NR	
	7440-36-0	Antimony				NR	
	7440-38-2	Antimony				NR	
	7440-38-2	Barium				NR	
	7440-39-3	Beryllium				NR	
	_7440-41-7	Cadmium				NR	
	7440-73-9	Calcium				NR	
	_7440-70-2	Chromium				NR	
	7440-47-3	Cobalt			-	NR	
					<u> </u>		
	_7440-50-8	Copper	25100		<del>-</del>	NR	
	7439-89-6	Iron	35100			P	
	7439-92-1	Lead				NR	
	_7439-95-4	Magnesium	<del>-</del>		<u> </u>	NR NR	
	_7439-96-5	Manganese				NR	
	_7439-97-6	Mercury				NR	
	_7440-02-0	Nickel				NR	
	_7440-09-7	Potassium				NR	
	7782-49-2	Selenium				NR NR	
	7440-22-4	Silver		-		NR	
	7440-23-5	Sodium				NR.	
	_7440-28-0	Thallium				NR	
	_7440-62-2	Vanadium		-		NR	
	7440-66-6	Zinc				NR NR	
		Cyanide				NR	

FORM I - IN

#### U.S. EPA - CLP EPA SAMPLE NO. INORGANIC ANALYSIS DATA SHEET MW-3 MITKEM CORPORATION\_ Contract: Name: ab Code: 90091\_\_\_ Case No.: SAS No.: SDG No.: MITKEM trix (soil/water): WATER\_ Lab Sample ID: D90091003\_\_\_\_\_ Date Received: 01/24/02\_\_\_\_ Level (low/med): MED\_\_\_\_ Solids: UG/L Concentration Units (ug/L or mg/kg dry weight): CAS No. Analyte Concentration C Q M NR 7429-90-5 Aluminum NR \_7440-36-0\_ Antimony\_ NR \_7440-38-2\_ Arsenic\_ \_7440-39-3\_ Barium\_ NR NR 7440-41-7\_ Beryllium\_ Cadmium NR \_7440-43-9\_ \_7440-70-2\_ Calcium\_ NR \_7440-47-3\_ Chromium\_ NR NR Cobalt\_ \_7440-48-4\_ NR \_7440-50-8\_ Copper\_

4000\_

\_7439-89-6\_

\_7439-92-1\_

7439-95-4

\_7439-96-5\_

\_7439-97-6\_

\_7440-02-0\_

7440-09-7

\_7782-49-2\_

\_7440-22-4\_

\_7440-23-5\_

7440-28-0\_

\_7440-62-2\_

\_7440-66-6\_

Iron

Lead

Magnesium

Manganese\_

Mercury\_

Potassium

Selenium\_

Nickel\_

\_Silver\_

Zinc\_ Cyanide\_

Sodium\_

Thallium

Vanadium\_

P\_

NR

NR

NR NR

NR

NR NR

NR

NR

NR

NR NR

NR

lor Before:		Clarity Before:	 Texture:	
C lor After:		Clarity After:	 Artifacts:	
Comments: DISSOLV	ED_METALS_FOR_M	W-3	 	

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ode:	MITKEM	Case No.:		SAS No.:			SDG No.: 90091_
x (soil/w	ater):	WATER_		L	ab Sampl	e ID:	T90091004
l (low/me	ed):	MED		D	ate Recei	ved:	01/24/02
olids:							
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L
	CAS No.	Analyte	Concentration	С	Q	M	
					`		
	_7429-90-5	Aluminum				NR	
	_7440-36-0	Antimony				NR	
	7440-38-2	Arsenic				NR	
	7440-39-3	Barium_				NR	
	7440-41-7	Beryllium				NR	
	7440-43-9	Cadmium				NR	
	7440-70-2	Calcium				NR	
	7440-47-3	Chromium				NR	
	7440-48-4	Cobalt				NR	
	7440-50-8	Copper				NR	
	_7439-89-6	Iron	1330			P	
	_7439-92-1	Lead				NR	
	_7439-95-4	Magnesium				NR	
	7439-96-5	Manganese				_NR	
	_7439-97-6	Mercury				NR	
	7440-02-0	Nickel				NR	
	_7440-09-7	Potassium				_NR	
	7782-49-2	Selenium				NR	
	7440-22-4	Silver				NR	
	7440-23-5	Sodium				NR	
	_7440-28-0	Thallium				NR	
		Vanadium				NR	
	_7440-62-2					NR	
	7440-62-2 7440-66-6	Zinc					

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e:	MITKEM_CO	ORPORATION	Co	ontract:			MW-4
e:	MITKEM	Case No.:		SAS No	.:		SDG No.: 90091_
oil/w	vater):	WATER_			Lab San	aple ID:	D90091004
w/m	ed):	MED			Date Re	ceived:	01/24/02
:							
	Concentration	Units (ug/L or mg/	kg dry weight):				UG/L
	CAS No.	Analyte	Concentration	С	Q	М	
	_7429-90-5	Aluminum	-			NR	
	_7440-36-0	Antimony				NR	
	_7440-38-2	Arsenic				NR	
	_7440-39-3	Barium				NR	
	7440-41-7	Beryllium				NR	
	_7440-43-9	Cadmium				NR	
	_7440-70-2	Calcium	_			NR	
	_7440-47-3	Chromium				NR	
	_7440-48-4	Cobalt				NR	
	_7440-50-8	Copper				NR	
	_7439-89-6	Iron	25.0_	U_		P	
	7439-92-1	Lead				NR	
	_7439-95-4	Magnesium				NR	
	_7439-96-5	Manganese				NR	
	_7439-97-6	Mercury				NR	
	7440-02-0	Nickel				NR	
	7440-09-7	Potassium				NR	
	_7782-49-2	Selenium				NR	
	_7440-22-4	Silver				NR	
	7440-23-5	Sodium	_			NR	
	_7440-28-0	Thallium				NR	
	_7440-62-2	Vanadium				NR	
	_7440-66-6	Zinc				NR	
		Cyanide				NR	
fore			Clarity Before:				Texture:
			•				_
fter:			Clarity After:	_			Artifacts: _
its:	COLVED MET	ALC EOD MANA					
מות	POLAED WEI	ALS_FUK_MW-4_					

#### 1 EPA SAMPLE NO. INORGANIC ANALYSIS DATA SHEET MW-5 I '5 Name: MITKEM\_CORPORATION\_\_ Contract: Lab Code: SDG No.: MITKEM Case No.: SAS No.: 90091\_\_\_\_ Mutrix (soil/water): WATER\_ Lab Sample ID: T90091005\_\_\_\_\_ Level (low/med): MED\_\_\_\_ Date Received: 01/24/02\_\_\_\_ Solids: Concentration Units (ug/L or mg/kg dry weight): UG/L C CAS No. Analyte Concentration Q M Aluminum NR \_7429-90-5\_ \_7440-36-0\_ Antimony\_\_ NR NR \_7440-38-2\_ Arsenic\_ Barium\_ NR \_7440-39-3\_ NR \_7440-41-7\_ Beryllium\_ Cadmium\_ NR \_7440-43-9\_ Calcium\_ NR \_7440-70-2\_ NR \_7440-47**-**3\_ Chromium\_ Cobalt\_ NR <u>.</u>7440**-**48-4\_ NR \_7440-50-8\_ Copper\_\_\_ 3910\_ P\_ \_7439-89-6\_ Iron\_ NR 7439-92-1 Lead\_ NR \_Magnesium\_ \_7439-95-4\_ NR. \_7439-96-5\_ Manganese\_\_ 7439-97-6\_ Mercury\_\_\_ NR. NR \_7440-02-0\_ Nickel\_ Potassium\_ NR \_7440-09-7\_ Selenium NR \_7782-49-2\_ Silver\_\_\_ NR \_7440-22-4\_ NR \_7440-23-5\_ Sodium Thallium NR \_7440-28-0\_ Vanadium NR \_7440-62-2\_ NR \_7440-66-6\_ $Zinc_{-}$ Cyanide\_ NR lor Before: Clarity Before: Texture: ~ olor After: Clarity After: Artifacts: Comments:

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		INO	1 RGANIC ANALYS	SIS DATA	SHEET		EPA SAMPLE N	Ο.	
o Name:	MITKEM_CO	ORPORATION	Co	ntract:			MW-5		
b Code:	MITKEM	Case No.:		SAS No.:			SDG No.: 90091	i	
trix (soil/w	ix (soil/water): WATER_				Lab Samp	le ID:	D90091005	_	
vel (low/m	el (low/med): MED				Date Rece	ived:	01/24/02		
Solids:									
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L		
	CAS No.	Analyte	Concentration	С	Q	M			
)		Aluminum				NR			
	_7440-36-0	Antimony				NR			
	_7440-38-2	Arsenic				NR			
	_7440-39-3	Barium				NR			
	_7440-41-7	Beryllium				NR			
	_7440-43-9	Cadmium				NR			
	_7440-70-2	Calcium				NR			
	7440-47-3	Chromium				NR			
	7440-48-4	Cobalt				NR			
	_7440-50-8	Copper				NR			
	_7439-89-6	Iron	1820_		_	P			
	_7439-92-1	Lead				NR			
	_7439-95-4	Magnesium				NR			
	_7439-96-5	Manganese				NR			
	_7439-97-6	Mercury				NR			
	_7440-02-0	Nickel				NR			
	_7440-09-7	Potassium				NR			
	_7782-49-2	Selenium				NR			
	_7440-22-4	Silver				NR			
	_7440-23-5	Sodium				NR			
	_7440-28-0	Thallium				NR			
	/440-20-0_								
•						NR			
1	7440-28-0 7440-62-2 7440-66-6	VanadiumZinc							

blor Before:		Clarity Before:	 Texture:	
olor After:		Clarity After:	 Artifacts:	
Comments: DISSOLV	ED_METALS_FOR_N	ЛW-5	 	

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ame:	MITKEM_CO	ORPORATION	Co	ntract:			MW-6
ode:	MITKEM	Case No.:		SAS No	.:		SDG No.: 90091
(soil/w	ater):	WATER_			Lab Samp	le ID:	T90091006
(low/me	ed):	MED			Date Rece	ived:	01/24/02
ids:							
	Concentration	Units (ug/L or mg.	/kg dry weight):				UG/L
	CAS No.	Analyte	Concentration	С	Q	M	
	7420.00.5	A 1			<u> </u>	NTD	
	_7429-90-5	Aluminum				NR	
	_7440-36-0	Antimony				NR	
	_7440-38-2	Arsenic		_		NR	
	_7440-39-3	Barium				NR	
	_7440-41-7	Beryllium				NR	
	_7440-43-9	Cadmium				NR	
	_7440-70-2	Calcium				NR	
	_7440-47-3	Chromium				NR	
	7440-48-4	Cobalt				NR	
	_7440-50-8	Copper				NR	
	_7439-89-6	Iron	2410_			P	
	_7439-92-1	Lead				NR	
	_7439-95-4	Magnesium				NR	
	_7439-96-5	Manganese				NR	
	_7439-97-6	Mercury				NR	
	_7440-02-0	Nickel				NR	
	_7440-09-7	Potassium				NR	
	_7782-49-2	Selenium				NR	
	_7440-22-4	Silver				NR	
	_7440-23-5	Sodium				NR	
	_7440-28-0	Thallium				NR	
	_7440-62-2	Vanadium				NR	
	_7440-66-6	Zinc				NR	
		Cyanide			<u> </u>	NR	
							,
Before:			Clarity Before:				Texture:
After:			Clarity After:	_			Artifacts:
nents:							
. —							

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me:	MITKEM CO	ORPORATION	Con	tract:			MW-6	
	MITALIN_CC	M ORATION		maci.				
ode:	MITKEM	Case No.:		SAS No.	:		SDG No.: 9	0091
x (soil/w	rater):	WATER_			Lab Samp	ole ID:	D90091006	i
l (low/med):		MED			Date Reco	eived:	01/24/02	_
lids:								
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L	
	CAS No.	Analyte	Concentration	С	Q	М		
	7429-90-5	Aluminum	-			NR		
	7440-36-0	Antimony				NR		
	7440-38-2	Arsenic				NR		
	7440-39-3	Barium		-		NR		
	7440-41-7	Beryllium_				NR		
	7440-43-9	Cadmium				NR		
	_7440-70-2	Calcium				NR		
	7440-47-3	Chromium				NR		
	7440-48-4	Cobalt				NR		
	_7440-50-8	Coount				NR		
	7439-89-6	Iron	2060			P		
	_7439-92-1	Lead				NR		
	_7439-95-4	Magnesium				NR		
	_7439-96-5	Manganese_				_ NR		
	_7439-97-6	Mercury				NR		
	_7440-02-0	Nickel				NR		
	_7440-09-7	Potassium_				NR		
	_7782-49-2	Selenium				NR		
	_7440-22-4	Silver_				NR		
	_7440-23-5	Sodium				NR		
	7440-28-0	Thallium				NR		
	_7440-62-2	Vanadium_				NR		
	_7440-66-6	Zinc				NR	•	
		Cyanide				NR		
Before			Clarity Patara				Texture:	
			Clarity Before:	_				
After:			Clarity After:				Artifacts:	
ients:								
	COLUMN MET	TO FOR MANY						

FORM I - IN

#### 1 EPA SAMPLE NO. INORGANIC ANALYSIS DATA SHEET MW-7 MITKEM\_CORPORATION\_\_ Name: Contract: ab Code: MITKEM Case No.: SAS No.: SDG No.: 90091\_\_\_ WATER\_ Lab Sample ID: T90091007\_\_\_\_\_ ∮ τix (soil/water): evel (low/med): MED\_\_\_\_ Date Received: 01/24/02\_\_\_\_ colids: Concentration Units (ug/L or mg/kg dry weight): UG/L C CAS No. Analyte Concentration Q M \_7429-90-5\_ Aluminum\_ NR NR \_7440-36-0\_ Antimony\_\_ Arsenic\_\_ NR \_7440-38-2\_ NR \_7440-39-3 Barium\_ NR Beryllium\_\_ \_7440-41-7\_ NR 7440-43-9 Cadmium\_\_\_ 7440-70-2\_ Calcium\_ NR NR Chromium\_ \_7440-47-3\_ NR. \_7440-48-4 .Cobalt\_ NR 7440-50-8 .Copper\_\_\_ \_30000\_ Iron\_\_\_ $\mathbf{P}_{-}$ \_7439-89-6\_ NR \_7439-92-1\_ Lead\_ NR \_7439-95-4. Magnesium\_ NR \_7439-96-5\_ Manganese\_\_\_ NR \_7439-97-6\_ Mercury\_ Nickel\_ NR \_7440-02-0\_ NR \_7440-09-7\_ Potassium\_ Selenium NR \_7782-49-2\_ NR \_7440-22-4\_ Silver\_ Sodium\_ NR \_7440-23-5\_ \_7440-28-0\_ Thallium\_ NR NR. \_7440-62-2 Vanadium\_ 7440-66-6\_ Zinc NR. Cyanide\_ NR. Cor Before: Clarity Before: Texture: C for After: Artifacts: Clarity After: Comments:

FORM I - IN

EPA SAMPLE NO. INORGANIC ANALYSIS DATA SHEET MW-7 MITKEM\_CORPORATION\_ عد Name: Contract: ab Code: MITKEM Case No.: SAS No.: SDG No.: 90091\_\_\_ ां तंप्र (soil/water): WATER\_ Lab Sample ID: D90091007\_\_\_\_\_ Level (low/med): Date Received: 01/24/02\_\_\_\_ MED\_\_\_\_ olids: Concentration Units (ug/L or mg/kg dry weight): UG/L CAS No. Analyte Concentration C Q M \_7429-90-5\_ Aluminum\_ NR 7440-36-0\_ Antimony\_ NR NR \_7440-38-2 Arsenic\_\_ NR \_7440-39-3\_ Barium Beryllium\_\_ NR \_7440-41-7\_ 7440-43-9 Cadmium NR \_7440-70-2\_ Calcium NR Chromium\_ NR \_7440-47-3\_ NR \_7440~48-4\_ .Cobalt\_\_ Copper\_\_\_ NR \_7440-50-8\_ 4020 Ρ... 7439-89-6\_ Iron\_ NR \_7439**-**92-1\_ Lead\_ \_7439-95-4\_ Magnesium\_ NR NR \_7439-96-5\_ Manganese\_ NR \_7439-97-6\_ Mercury\_ Nickel\_ NR \_7440-02-0\_ Potassium\_ NR \_7440-09-7\_ Selenium\_\_ NR 7782-49-2 7440-22-4\_ Silver NR Sodium\_ NR \_7440-23-5\_ Thallium\_ \_7440-28-0\_ NR. \_7440-62-2\_ Vanadium\_ NR .7440-66-6\_ Zinc\_ NR Cyanide\_ NR Oppor Before: Clarity Before: Texture: Cator After: Clarity After: Artifacts: Comments: DISSOLVED\_METALS\_FOR\_MW-7\_\_\_\_\_

FORM I - IN

me:	MITKEM_CO	ORPORATION	Contra	ict:			MW-8
ode:	MITKEM	Case No.:	S.	AS No	.:		SDG No.: 90091_
x (soil/w	ater):	WATER_			Lab Samp	ole ID:	T90091008
(low/me	ed):	MED			Date Rece	eived:	01/24/02
lids:							
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L
	CAS No.	Analyte	Concentration	С	Q	M	
	_7429-90-5	Aluminum				NR	
	7440-36-0	Antimony				NR	
	_7440-38-2	Arsenic				NR	
	7440-39-3	Barium				NR	
	7440-41-7	Beryllium				NR	
	_7440-43-9	Cadmium				NR	
	_7440-70-2	Calcium				NR	
	7440-47-3	Chromium				NR	
	_7440-48-4	Cobalt				NR	
	7440-50-8	Copper				NR	
	_7439-89-6	Iron	4370			P	
	_7439-92-1	Lead	15/0			NR	
	_7439-95-4	Magnesium				NR	
	7439-96-5	Manganese_				NR	
	_7439-97-6	Mercury		1		NR	
	_7440-02-0	Nickel				NR	
	_7440-09-7	Potassium		_		NR	
	_7782-49-2	Selenium	_			NR	
	_7440-22-4	Silver				NR	
	1						
			-				
		SodiumThalliumVanadiumZincCyanide					NR NR NR NR NR NR
re:			Clarity Before:	_			Texture:
r After:			Clarity After:	_			Artifacts:
ments:							

e:	MITKEM	Case No.:		SAS No	.:		SDG No.: 90091
oil/w	ater):	WATER_			Lab Samp	le ID:	D90091008
w/me	ed):	MED			Date Rece	eived:	01/24/02
:							
	Concentration	Units (ug/L or mg.	/kg dry weight):				UG/L
				_	_		
	CAS No.	Analyte	Concentration	С	Q	M	
	_7429-90-5	Aluminum				NR	
	7440-36-0	Antimony				NR	
	7440-38-2	Arsenic				NR	
	7440-39-3	Barium				NR	
	7440-41-7	Beryllium				NR	
	_7440-43-9	Cadmium				NR	
	_7440-70-2	Calcium				NR	
	_7440-47-3	Chromium				NR	
	_7440-48-4	Cobalt				NR	
	_7440-50-8	Copper				NR	
	_7439-89-6	Iron	48.7_	B_		P	
	_7439-92-1	Lead	_			NR	
	_7439-95-4	Magnesium				NR	
	_7439-96-5	Manganese				NR	
	_7439-97-6	Mercury				NR	
	_7440-02-0	Nickel				NR	
	_7440-09-7	Potassium				NR	
	7782-49-2	Selenium				NR	
	_7440-22-4	Silver				NR	
	7440-23-5	Sodium				NR	
	7440-28-0	Thallium				NR	
	_7440-62-2	Vanadium				NR	
	7440-66-6	Zinc	-		-	NR	
		Cyanide		_	_	NR	
C			Cl. 'to D. C.				Tools
efore	-		Clarity Before:	-			Texture:
fter:	-		Clarity After:	_			Artifacts:
ıts:							
	SOLVED META	ALS MW-8					

FORM I - IN

		INO	EPA SAMPLE NO.						
Name:	MITKEM_CO	DRPORATION	PORATION Contract:						
Code:	MITKEM	Case No.:		SAS No.:			SDG No.:	90091	
rix (soil/w	vater):	WATER_		I	ab Sampi	le ID:	T9009100	9	
el (low/me	ed):	MED		I	Date Rece	ived:	01/24/02_		
olids:									
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L		
	CAGNA								
	CAS No.	Analyte	Concentration	C	Q	M			
		Aluminum				NR			
	7440-36-0	Antimony				NR			
	7440-38-2	Arsenic				NR			
	7440-39-3	Barium				NR			
	7440-41-7	Beryllium_			•	NR			
	7440-43-9	Cadmium				NR			
	_7440-70-2	Calcium			_	NR			
	_7440-47-3	Chromium		7		NR			
	_7440-48-4	Cobalt				NR			
	_7440-50-8	I				NR			
	_7439-89-6	Iron				P_			
	_7439-89-0	Lead				NR			
	_7439-92-1	Magnesium				NR			
		Magnesium Manganese		-		NR			
	_7439-96-5				·	NR NR			
	_7439-97-6	Mercury							
	7440-02-0	Nickel		<del></del>		NR			
	_7440-09-7	Potassium				_NR			
	_7782-49-2	Selenium				NR			
	_7440-22-4	Silver				NR			
	_7440-23-5	Sodium				NR			
	_7440-28-0	Thallium				NR			
	_7440-62-2	Vanadium				NR			
	_7440-66-6	Zinc				NR			
		Cyanide			· ·	NR			
or Before:			Clarity Before:				Texture:		
or After:			Clarity After:				Artifacts:		
nments:									

FORM I - IN

# 1 INORGANIC ANALYSIS DATA SHEET

	SAMPL	TO ATO
FFA	SAMPL	HNU

ame:	MITKEM_CO	DRPORATION	Co	ntract:			MW-9	
ode:	MITKEM	Case No.:	<del></del>	SAS No.	:		SDG No.: 90	091
x (soil/w	vater):	WATER_			Lab Samp	le ID:	D90091009_	
(low/m	ed):	MED			Date Rece	ived:	01/24/02	-
lids:		<del></del>						
	Concentration	Units (ug/L or mg	/kg dry weight):				UG/L	
	CAS No.	Analyte	Concentration	С	Q	M		
	CAS No.	Analyte	Concentration		Q	IVI		
	_7429-90-5	Aluminum				NR		
	7440-36-0	Antimony				NR		
	7440-38-2	Arsenic				NR		
	7440-39-3	Barium				NR		
	_7440-41-7	Beryllium				NR		
	7440-43-9	Cadmium				NR		
	7440-70-2	Calcium				NR		
	_7440-47-3	Chromium				NR		
	_7440-48-4	Cobalt			_	NR		
	_7440-50-8	Copper				NR		
	_7439-89-6	Iron	25.0	U		P_		
	7439-92-1	Lead				NR		
	_7439-95-4	Magnesium				NR		
	_7439-96-5	Manganese_				NR		
	_7439-97-6	Mercury				NR		
	7440-02-0	Nickel				NR		
	_7440-09-7	Potassium				NR		
	7782-49-2	Selenium				NR		
	7440-22-4	Silver				NR		
	_7440-23-5	Sodium				NR		
	_7440-28-0	Thallium				NR		
	_7440-62-2	Vanadium				NR		
	7440-66-6	Zinc		_		NR		
	7110000	Cyanide				NR		
r Before	:	<u>-</u>	Clarity Before:	_			Texture:	_
r After:			Clarity After:	_			Artifacts:	_
ments:								
	SOLVED_META	ALS_MW-9			_			
				_				

FORM I - IN

# 3 BLANKS

Name:	MITKEM_CORPOR	ATION	_	Contract:	<del></del>		
ام Code:	MITKEM	Case No.:		SAS No.:		SDG No.:	90091
Paration Bla	nk Matrix (soil/water):	•		WATER			
aration Bla	nk Concentration Units	(ug/L or mg/kg	):		UG/L		

Initial Calib. Blank	C		Blank (u	g/L)	C	3		Prepa- ration		М
(ug/L)	C	1	C	4	C	J	ا	Diank		141
										1
										1
25.0	U	25.0	U	25.0	U	25.0	U	86,700	В	P
_				-						
				-						
										1
	Calib. Blank (ug/L)	Calib. Blank (ug/L) C	Calib. Con Blank (ug/L) C 1  25.0 U_ 25.0	Calib. Continuing Cont	Calib. Blank (ug/L) C 1 C 2  25.0 U 25.0 U 25.0 Continuing Calibration Blank (ug/L) C 2	Calib. Blank (ug/L) (ug/L) C 1 C 2 C   25.0 U 25.0	Calib. Blank (ug/L) (ug/L) C 1 C 2 C 3  25.0 U 25.0 U 25.0 U 25.0 U 25.0	Calib. Blank (ug/L) C 1 C 2 C 3 C  Ug/L) C 1 C 2 C 3 C  25.0 U 25.0 U 25.0 U 25.0 U	Calib.         Continuing Calibration         Preparation           Blank (ug/L)         1         C         2         C         3         C         Blank           Blank (ug/L)         0         1         C         2         C         3         C         Blank           Blank (ug/L)         0	Calib. Blank (ug/L) C 1 C 2 C 3 C Blank C Blank C 2 C 3 C Blank C Blank C 2 C 3 C Blank C Blan

FORM III - IN

# 3 BLANKS

Name.	WITKEWI_CORFOR	ATION	_	Contract.			
L ° ካ Code:	MITKEM	Case No.:		SAS No.:		SDG No.:	90091
PReparation Bla	nk Matrix (soil/water):			WATER			
P paration Bla	nk Concentration Units	s (ug/L or mg/kg)	):		UG/L		

Calib. Blank	-	Con	tinuing ( Blank ()	Calibration 1g/L)				Prepa- ration		
(ug/L)	С	1	С	2	С	3	С	Blank	С	M
				-						
										$\perp$
		25.0	U_	25.0	U			25.000_	U	P
							L			
	(ug/L)	(ug/L) C				(ug/L) C 1 C 2 C				

# 3 BLANKS

Name:	MITKEM_CORPOR	ATION	-	Contract:		
ა Code:	MITKEM	Case No.:		SAS No.:	 SDG No.:	90091
Reparation Bla	nk Matrix (soil/water):			_		
<sup>2</sup> paration Bla	nk Concentration Units	(ug/L or mg/kg):	:			

-	Initial Calib. Blank			Blank (u	alibration g/L)				Prepa- ration		
nalyte	(ug/L)	С	1	С	2	С	3	С	Blank	С	M
Aluminum											
Antimony											ļ
rsenic											ļ
Barium											
Beryllium											<u> </u>
admium							_				
alcium											
Chromium											<u> </u>
Cobalt											<u> </u>
opper											
iron	47.9	B	62.5	B	44.8	В					P_
Lead											
lagnesium											
anganese											
Mercury											
lickel											
otassium											
Selenium											
Silver											
odium											
Thallium											
Vanadium					_						
Cinc											
yanide											

FORM III - IN

· SW846

## 7 LABORATORY CONTROL SAMPLE

. Name:	MITKEM_CO	RPORATION	Contract:	 _	
ab Code:	MITKEM	Case No.:	 SAS No.:	 SDG No.:	90091
id LCS Sou	rce:				
Aqueous LCS		HIGH_PURITY_			

	Aqu	ieous (ug/L)				Solid (n	ng/kg)	
Analyte	True	Found	%R	True	Found	С	Limits	%R
luminum								
Antimony								
rsenic								
arium								
Beryllium								
Cadmium								
∛alcium								
hromium								
Cobalt								
Copper								
ron	4550.0	4564.2	100.3					
Lead								
*Iagnesium								
Mercury								
Nickel								
'otassium								
elenium								
Silver								
Godium								
Challium								
Vanadium								
Zinc								
Cyanide								

FORM VII - IN

#### U.S. EPA - CLP

# 9 ICP SERIAL DILUTIONS

EPA SAMPLE NO.

Lab Name:	MITKEM_C	ORPORATION <u>.</u>		Contract:		MW-1	
b Code:	MITKEM	Case No.:		SAS No.:		SDG No.:	90091
Matrix (soil/wa	iter):	WATER_			Level (low/	med):	MED
•		Co	oncentration Units:	ug/L			
							I

Analyte	Initial Sample Result (I)	С	Serial Dilution Result (S)	С	% Differ- ence	Q	M
Aluminum							_NF
Antimony							_NF
Arsenic							_NF
Barium						ŀ	_NF
Beryllium							NF
Cadmium							NF
Calcium							LNF
Chromium							N
Cobalt							LNI
.Copper							NE
Iron	3760.20		3844.51		2.2		_P_
Lead							NE
Magnesium							NE
Manganese							N
Mercury							_NI
Nickel							N
Potassium							N
Selenium							NI
Silver							NI
Sodium							[NI
Thallium							_NI
Vanadium							[N]
Zinc							NI

# MITKEM Corporation

\* Wet Chemistry \*



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

MW-1

Lab ID:

90091001

<u>Analyte</u>	<u>Results</u>	Reporting <u>Limit</u>	<u>Units</u>	Analysis <u>Method</u>	Analysis <u>Date</u>
Free CO2	42	10	mg/L	SM 4500-CO2C	1/24/02
Nitrate/Nitrite-N	3.0	0.05	mg/L	EPA 353.2	1/26/02
Sulfates	17	7	mg/L	SM 4500-SO4 E	1/24/02
TOC	8	6	mg/L	EPA 415.1	1/26/02

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Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

MW-2

Lab ID:

90091002

Analyte	Results	Reporting <u>Limit</u>		Units	Analysis <u>Method</u>	Analysis <u>Date</u>
Free CO2 Nitrate/Nitrite-N	40 ND	10 5	*	mg/L mg/L	SM 4500-CO2C EPA 353.2	1/24/02 1/26/02
Sulfates TOC	150 18	7 6		mg/L mg/L	SM 4500-SO4 E EPA 415.1	1/24/02 1/26/02

ND = Not Detected

\*Elevated due to sample matrix effects

Page 1 of 1



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

MW-3

Lab ID:

90091003

Analyte	Results	Reporting <u>Limit</u>		<u>Units</u>	Analysis <u>Method</u>	Analysis <u>Date</u>
Free CO2	70	10		mg/L	SM 4500-CO2C	1/24/02
Nitrate/Nitrite-N	ND	5	*	mg/L	EPA 353.2	1/26/02
Sulfates	24	7		mg/L	SM 4500-SO4 E	1/24/02
TOC	70	6		mg/L	EPA 415.1	1/26/02

ND = Not Detected

\*Elevated due to sample matrix effects

Page 1 of 1 90091003



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

MW-4

Lab ID:

90091004

	<u>Analyte</u>	<u>Results</u>	Reporting <u>Limit</u>	<u>Units</u>	Analysis <u>Method</u>	Analysis <u>Date</u>
•	Free CO2	40	10	mg/L	SM 4500-CO2C	1/24/02
	Nitrate/Nitrite-N	3.2	0.05	mg/L	EPA 353.2	1/26/02
	Sulfates	22	7	mg/L	SM 4500-SO4 E	1/24/02
	TOC	13	6	mg/L	EPA 415.1	1/26/02

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Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

MW-5

Lab ID:

90091005

<u>Analyte</u>	Results	Reporting <u>Limit</u>	<u>Units</u>	Analysis <u>Method</u>	Analysis <u>Date</u>
Free CO2	12	10	mg/L	SM 4500-CO2C	1/24/02
Nitrate/Nitrite-N	0.62	0.05	mg/L	EPA 353.2	1/26/02
Sulfates	12	7	mg/L	SM 4500-SO4 E	1/24/02
TOC	14	6	mg/L	EPA 415.1	1/26/02

Page 1 of 1



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

MW-6

Lab ID:

90091006

	<u>Analyte</u>	Results	Reporting <u>Limit</u>		<u>Units</u>	Analysis <u>Method</u>	Analysis <u>Date</u>
	Free CO2 Nitrate/Nitrite-N	32 ND	10 5	*	mg/L mg/L	SM 4500-CO2C EPA 353.2	1/24/02 1/26/02
نان	Sulfates TOC	19 25	7 6		mg/L mg/L	SM 4500-SO4 E EPA 415.1	1/24/02 1/26/02

ND = Not Detected

\*Elevated due to sample matrix effects

Page 1 of 1



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

MW-7

Lab ID:

90091007

	<u>Analyte</u>	Results	Reporting <u>Limit</u>		<u>Units</u>	Analysis <u>Method</u>	Analysis <u>Date</u>
	Free CO2 Nitrate/Nitrite-N	35 ND	10 5	*	mg/L mg/L	SM 4500-CO2C EPA 353.2	1/24/02 1/26/02
i.	Sulfates TOC	38 21	7 6		mg/L mg/L	SM 4500-SO4 E EPA 415.1	1/24/02 1/26/02

ND=Not Detected

\*Elevated due to sample matrix effects

Page 1 of 1



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

8-WM

Lab ID:

90091008

<u>Analyte</u>	Res	Reporting sults Limi	•	<u>Units</u>	Analysis <u>Method</u>	Analysis <u>Date</u>
Free CO2 Nitrate/Nitrite-N Sulfates TOC		22 10 ND 5 ND 7 25 6	5 * 7	mg/L mg/L mg/L mg/L	SM 4500-CO2C EPA 353.2 SM 4500-SO4 E EPA 415.1	1/24/02 1/26/02 1/24/02 1/26/02

ND = Not Detected

\*Elevated due to sample matrix effects.

Page 1 of 1



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

MW-9

Lab ID:

90091009

<u>Analyte</u>	Results	Reporting <u>Limit</u>		<u>Units</u>	Analysis <u>Method</u>	Analysis <u>Date</u>
Free CO2	ND	200	*	mg/L	SM 4500-CO2C	1/24/02
Nitrate/Nitrite-N	0.69	0.05		mg/L	EPA 353.2	1/26/02
Sulfates	23	7		mg/L	SM 4500-SO4 E	1/24/02
TOC	15	6		mg/L	EPA 415.1	1/26/02

ND = Not Detected

\*Elevated due to sample matrix effects

Page 1 of 1



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

Lab ID:

Method Blank

-	<u>Analyte</u>	Results	Reporting <u>Limit</u>	<u>Units</u>	Analysis <u>Method</u>	Analysis <u>Date</u>
	Free CO2	ND	10	mg/L	SM 4500-CO2C	1/24/02
	Nitrate/Nitrite-N	ND	0.05	mg/L	EPA 353.2	1/26/02
	Sulfates	ND	7	mg/L	SM 4500-SO4 E	1/24/02
	TOC	ND	6	mg/L	EPA 415.1	1/26/02

ND = Not Detected

Page 1 of 1

90091-MB



Client:

Lawler, Matusky, & Skelly Eng.

Matrix: Aqueous

Client ID:

Lab ID:

Lab Control Sample

<u>Analyte</u>	% Recovery	Analysis <u>Method</u>	Analysis <u>Date</u>
Free C02	95	SM 4500-CO2C	1/26/02
Nitrate/Nitrite-N	103	EPA 353.2	1/24/02
Sulfates	88	SM 4500-SO4 E	1/26/02
TOC	96	EPA 415.1	1/24/02

Page 1 of 1

90091-LCS

Last Page of Data Report