ARCHIE MARDIKIAN

MARDIKIAN REMEDIATION

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DELANO, CA.
SECTION 35 T.24S R25E

PROJECT NO. 200102A
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661 ROAD 148
DELANO, CALIFORNIA

Prepared for:

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Project #200102A

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MARDIKIAN PROPERTY REMEDIATION AND CLOSURE REQUEST

1.0 INRODUCTION

From April 13 to April 22, 2005, approximately 540 cubic yards of vadose zone soil was removed from the Mardikian Property (Site) (**Figure 1** – Site Location Map) using a casing auger drilling rig, following approval by the California Regional Water Quality Control Board – Central Valley Region (RWQCB) of RAM Environmental Engineering Services Inc.'s (RAM) Corrective Action Plan dated July 5, 2004.

This report details the abandonment of monitoring well MW-1, the soil removal process, the amount of impacted soil removed, and the results of water analysis from the three groundwater monitoring wells on Site, before and after removal of the contaminated soil.

On behalf of Mr. Archie Mardikian, the responsible party, RAM requests closure of the Site. This request is based on the historical investigation and monitoring data, discussions with CRWQCB staff, and the results of corrective action implemented at the Site.

2.0 BACKGROUND

2.1 Site Characteristics and Background

The Site is a farmstead property where a former underground storage tank (UST) held gasoline for use by the Greg Mardikian residents for personal vehicles. Soil and groundwater investigations conducted for this site indicate that leakage of gasoline from the UST has impacted soil and groundwater. The 200-gallon UST was removed shortly after it was taken out of service in 1989.

Investigations conducted in April 1991 (previous contractor) and August 2001, included drilling and sampling of one soil boring to a depth of 65 feet below ground surface (bgs), and the installation of one groundwater monitoring well, (monitoring well MW-1), completed in the first saturated zone at approximately 74 feet bgs, screened from 62 to 92 feet bgs. Initial groundwater sampling of monitoring well MW-1 in the source area found a concentration of Total Petroleum Hydrocarbons as gasoline (TPHg) of 27,000 micrograms per liter (µg/l) (RAM, October 2001), see **Appendix A** – Previous Work, Soil Sample Analytical Results, and **Table 5.1C**, Summary of Groundwater Analytical Results.

In April 2002, a follow-up investigation included drilling and sampling of three soil borings near the former UST location to depths of 65 feet bgs, and installation and sampling of three additional groundwater monitoring wells (MW-2, MW-3, and MW-4). Soil sample analysis found TPHg and Volatile Organic Compounds (VOC) impacted soils with concentrations ranging from 590 to 5,100 milligrams per

kilogram (mg/Kg) of TPHg in the samples from the boring nearest the former UST .. location. Analysis of soil samples from the two other borings showed no detectable TPHg and very low concentrations (less than 1 mg/Kg) of constituent petroleum compounds benzene, toluene, ethyl-benzene, xylenes (BTEX) and methyl-t-butyl ether (MTBE) (**Appendix A – Previous Work**).

Five rounds of groundwater monitoring were completed between May 2002 and July 2004. Analysis of groundwater samples from the four-groundwater monitoring wells in May 2002 showed TPHg, BTEX, and MTBE present in MW-1, only TPHg (81 ug/L) and MTBE (160 ug/L) in the downgradient well MW-3, and no other detections of TPHg, or VOCs, see **Section 5.0 Groundwater Analysis**. Later analysis of groundwater samples revealed the steady decline in concentration of chemicals of concern.

Both investigations included analysis of soil and groundwater samples for TPHg (C4 – C12 range) by modified EPA Method 8015, and VOCs by EPA Method 8260b including BTEX, 1,2-dibromoethane (EDB), 1,2-dichloroethane (1,2-DCA); fuel oxygenates t-amyl methyl ether (TAME), t-butyl alcohol (TBA), diisopropyl ether (DIPE), ethyl-t-butyl ether (ETBE) and methyl-t-butyl ether (MTBE).

A water supply well search conducted as part of the July 2002 groundwater characterization showed that there are eight water supply wells within one quarter to one half mile of the Site in the downgradient or cross-gradient direction. Total well depth data is available for five of these wells and ranges from 420 to 1200 feet below ground surface. The reported water use is irrigation and/or domestic supply. One water supply well is within 1/8 mile of the Site, but is in an upgradient position to the north-northeast.

On July 5, 2004 RAM submitted a Corrective Action Plan (CAP) to the RWQCB, the CAP proposed three possible alternatives for remediation of the Site and closure. The first alternative included soil vapor extraction, the second was removal of contaminated soil using a casing auger drilling rig, and the third was a "no action" alternative. The RWQCB approved the soil removal CAP in correspondence ..... dated July 22, 2004.

3.0 GEOLOGIC SETTING

The Site is located within the San Joaquin Valley, which constitutes the southern portion of the Great Valley geomorphic province. Uplift of the Sierra Nevada Mountains east of the valley, later uplift of the Temblor Range on west side, and formation of the deep structural trough beneath the valley floor, have resulted in the accumulation of more than 30,000 feet of marine and terrestrial sediments in the basin. The sediments range in age from Jurassic to Holocene. Granitic and metamorphic rocks compose the eastern and southeastern flanks of the Great Valley, while the western flank comprises predominantly marine sedimentary rocks of pre-Tertiary age.

The stratigraphy of the southern San Joaquin Valley includes marine sedimentary rocks from the Cretaceous through Tertiary Periods. The Pliocene (Late Tertiary) and Pleistocene and Recent (Quaternary) depositional units are composed of unconsolidated non-marine rocks. The Plio-Pleistocene to Recent sediments resulted from progradation of alluvial fans from both the east and west, and fluctuations in the extent of a Pleistocene lake that had formed in the Valley floor. These deposits contain most of the fresh groundwater, and are underlain by or contain saline water at depth in most places. The limit of these deposits lies along the flanks of the Great Valley and they thicken basinward to more than 15,000 feet in the southern part of the San Joaquin Valley, where the base of the fresh water lies at a maximum depth of about 4,700 feet (Page, 1986, Croft, 1972). The Kern River Fan deposits, which prograded from the Sierra Nevada Mountains to the east, comprise the drinking water aquifers in the southern San Joaquin Valley.

The Site lies in the Tule Subregion of the Central Valley Groundwater Province. In the Delano area, shallow groundwater generally is a sodium and calcium chloride, sulfate type with a sodium content of 40 to 50 percent. Total dissolved solids (TDS) concentrations in the unconfined aquifer in the area range from approximately 400 to 800 mg/L (Davis, 1959 and KCWA, 2001).

Depth to groundwater at the Site was approximately 78.5 feet in April 2005. Subsurface soils encountered in soil borings at the Site consist of very fine to coarse grained sands and silty sands from approximately 10 feet below ground surface (bgs) to 35 feet bgs, sandy silts and occasional clayey silts from approximately 40 feet bgs to 50 feet bgs, and silty sands and sand with minor gravel from approximately 50 feet bgs to 75 feet bgs.

4.0 REMEDIATION – VADOSE ZONE SOIL REMOVAL

4.1 Procedures

Backfill soil analysis:

On March 11, 2005 a soil sample was collected from the proposed clean soil borrow area, the source of soil to be used to backfill the auger holes. Zymax Forensics and Envirotechnology analyzed the soil for:

- California Assessment Manual (CAM) 17 Metals by EPA Method 6020/7471, and,
- Chlorinated Pesticides by EPA Method 8081.

The 'clean soil' area analytical results are included in **Tables 4.1-A** and **4.1-B**. The soil contained trace amounts of 4,4'-DDE, 4,4'-DDT, Dieldrin, and metals. The results of the soil analysis are shown below; all concentrations of chemicals of concern are well below the Total Threshold Limit Concentration (TTLC), and Soluble Threshold Limit Concentration (STLC) values. All chemicals of concern

are also below the EPA Region IX recommended Preliminary Remediation Goals (PRG's), except for Dieldrin, which was found in a concentration of 0.003 mg/kg. This concentration is just above the Practical Quantitaion Limit (PQL) of 0.002 mg/kg, which is also the Risk Based Screening Level (RBSL). The concentration of Dieldrin was well below the TTLC of 8.0 mg/kg, and at the PRG of 0.003 mg/kg (the "Direct Contact Exposure Pathway for Residential Soils).

MW-1 Destruction:
On April 1, 2005 Consolidated Testing, Inc. abandoned monitoring well MW-1 by pumping grout in to the well from the total depth to 50 feet bgs. This work was under permit by Tulare County Environmental Health and witnessed by RAM Staff. The casing auger rig removed the upper portion of the well during the soil removal process on April 13, 2005.

Table 4.1-A
Borrow Area Soil Analysis CAM 17 Metals

Metals EPA Method 6020/7471	Composited Soils #1	Composited Soils #2	TTLC Value	STLC Value	RBSL
	mg/kg			mg/l	mg/kg
Antimony	ND	ND	500	15	210
Arsenic	2.7	2.7	500	5.0	13
Barium	86	100	10,000	100	2400
Beryllium	ND	ND	75	0.75	95
Cadmium	ND	ND	100	1.0	61
Chromium	9.3	11	500	5	12
Cobalt	4.1	4.9	8,000	80	2500
Copper	10	12	2,500	25	2500
Lead	14	19	1,000	5.0	1000
Mercury	ND	ND	20	0.2	160
Molybdenum	ND	ND	3,500	350	2500
Nickel	6.6	7.5	2,000	20	1000
Selenium	ND	ND	100	1.0	2500
Silver	ND	ND	500	5	2500
Thallium	ND	ND	700	7.0	37
Vanadium	15	18	2,400	24	2500
Zinc	51	63	5,000	250	2500

ND – analyte not detected at concentration at or above the Practical Quantitation Limit (PQL) listed in the complete laboratory reports included in **Appendix C**.
mg/kg – milligrams per kilogram
mg/l – milligrams per liter
CAM 17 metals – California Assessment Manual 17 metals

Table 4.1-B
Borrow Area Soil Analysis – Chlorinated Pesticides

Chlorinated Pesticides EPA Method 8081	Compoisted Soils #1	Composited Soils #2	TTLC	STLC	RBSL
	mg/kg			mg/l	mg/kg
Aldrin	ND	ND	1.4	0.14	
Alpha-BHC	ND	ND			
Beta-BHC	ND	ND			
Delta-BHC	ND	ND			
Gamma-BHC (Lindane)	ND	ND			
Chlordane	ND	ND	2.5	0.25	
4,4'-DDD	ND	ND	1.0	0.1	
4.4'-DDE	0.071	0.063	1.0	0.1	64
4,4'-DDT	0.029	0.025	1.0	0.1	4.3
Dieldrin	0.003	0.003	8.0	0.8	0.002
Endosulfan I	ND	ND			
Endosulfan II	ND	ND			
Endonsulfan sulfate	ND	ND			
Endrin	ND	ND	0.2	0.02	
Endrin aldehyde	ND	ND			
Endrin ketone	ND	ND			
Heptachlor	ND	ND	4.7	0.47	
Heptachor epoxide	ND	ND			
Methoxychlor	ND	ND	100	10	
Toxaphene	ND	ND	5	0.5	

ND – analyte not detected at concentration at or above the Practical Quantitation Limit (PQL) listed in the complete laboratory reports included in **Appendix C**.
mg/kg – milligrams per kilogram
mg/l – milligrams per liter
CAM 17 metals – California Assessment Manual 17 metals

Mr. Mardikian contracted with Diamond Resources Inc. (DRI) to implement the CAP and remove the contaminated soil. On April 8, 2005 Underground Services Alert was notified before beginning soil removal. On April 12, 2005, DRI prepared for soil removal by removing numerous subsurface water pipes that were located in the proposed soil removal area. One sub-surface water pipe was not removed as it provided water to a home on an adjacent property. One subsurface electrical line was also present in the proposed remediation area; it was not removed. DRI also removed a portion of the asphalt driveway to the Mardikian residence.

From April 13 to April 22, 2005 a casing auger-drilling rig was used to remove contaminated soil. The casing auger drilling rig creates a 36-inch diameter boring, and is capable to reaching a depth of 90-feet below ground surface (bgs). 33 borings were drilled at the Site as shown on **Figure 2**.

Each boring was monitored as described below. Borings were placed to avoid both the water line and the electrical line on Site. The placement of each boring was also decided on by the results from previous borings, and by Photo Ionization Detector (PID) readings. In general, the soil removed from the top of each boring contained no hydrocarbons; as the boring deepened the PID measurements increased and then decreased with depth. When the PID measurements were at a low level, below significantly impacted soil, a decision was made to terminate the boring. Each termination of borehole was above the groundwater level.

Loose well-graded sands are present at approximately 10 feet and 30 feet bgs at the Site. These two sand layers caused several of the borings to collapse when they were placed too close to a previous boring location; these borings are labeled with an 'A' on **Figure 2**. The center of the borings were placed approximately 5 to 6 feet apart to prevent the borings from collapsing and trapping the auger bucket.

The data recorded on the soil removal data sheet (**Appendix B**), was input into an Excel spread sheet (**Table 4.2**), and into the software program Surfer®. The software was used to calculate the volume of the soil removed, the volume of contaminated soil, and to create visual displays of the plume as it was encountered in the subsurface at discreet depth intervals (**Figures 3 - 11).**

As the borings were drilled, a soil sample was collected every 5 feet. The samples were used to construct a lithologic log and the concentration of VOCs in the soil was measured using a PID. Measurements were recorded on a soil removal data sheet, one sheet for each borehole; data sheets are included in **Appendix B**.

Impacted Soil Stockpile
Soils removed from the boreholes were temporarily stockpiled and covered with plastic. RAM reviewed the requirements of the San Joaquin Valley Air Pollution Control District (SJVAPCD) regarding hydrocarbon impacted soils, and met with the SJVAPCD engineering staff to review our operation.

It was decided by RAM with the concurrence of SJVAPCD that soils impacted with hydrocarbons would be put on the ground, covered with 6 inches of clean soil, becoming a non-aeration unit. Before the impacted soil was covered with clean soil it was spread with horse manure to a depth of 1 inch to hasten the bioremediation activity of the soil pile. Stockpiled soils have no VOC's at grade (0) and at 7 inches below grade, minor VOC's (5 – 7) measured with a PID.

Soil Sampling:
Soil samples were also collected from the total depth of 10 of the boreholes (see **Figure 14**, Soil Sample Locations); these samples were taken from the bucket of the auger rig as the soil was removed from the borehole. The soil was placed in a steel tube capped with Teflon liners and a plastic cap. The soil samples were labeled, placed in a zip-lock bag, and placed in an ice chest cooled with Blue-Ice™. Standard Chain of Custody procedures were followed for all sample collections; the samples were transported to ProVera Labs in Bakersfield, and were analyzed for:

- Total Petroleum Hydrocarbons as gasoline (TPHg) by EPA Method 8015M
- Benzene, Ethylbenzene, Toluene and Xylene by EPA Method 8260B, and
- MTBE by EPA Method 8260B

The soil analysis data was used to confirm that the soil left in place at the total depth of each borehole contains minor amounts of chemicals of concern; the data was placed in to a Risk Based Corrective Action model to determine if the remaining soil is a risk to a human receptor.

Each borehole was backfilled with clean soil from the designated borrow area, and compacted. After completion of the last boreholes, the entire Site was refilled and re- compacted, and the asphalt was replaced in the driveway area.

4.2 Surfer® and Excel Spreadsheet Results

Table 4.2 comprises an Excel spreadsheet that contains tabulated data from the boreholes. As the width of the boreholes is 36-inches, and each borehole was drilled to a known depth, the total volume of soil removed was calculated to be 540 cubic yards. Similar calculations were made for the volume of impacted soil removed; the results are shown on **Table 4.2** and summarized below.

- Total volume of soil removed: 540 cubic yards, which included

  soil removed with a PID reading of 100 or greater, 256 cubic yards, and

  soil removed with a PID reading of 500 or greater, 100 cubic yards.

The numerical reading from the PID gives an indication of the relative amount of VOC's in the soil, but does not quantify the concentration of VOC's. The PID reading was used in the field as a guide for borehole placement and depth, and to construct a series of maps in the software program Surfer® as described below.

The plot plan of the Site (**Figure 2**) was imported into Surfer®, borehole locations were digitized, and a series of maps constructed showing the PID readings at various depth 'slices' from 10 feet bgs to 70 feet bgs (**Figures 3 through 11).** A visual examination of the maps generated by Surfer®, shows that the greatest concentration of hydrocarbons in the soil is at about 40 feet bgs. Below 40 feet the area of greatest impact shrinks dramatically. This is likely due to the presence of fine-grained silty sand containing minor amounts of clay at this depth.

Two wireframe maps were also created in Surfer®, at a depth typically above the water table to depict the shape of the plume in the subsurface. **Figure 12** is a wireframe map constructed on the depth to the PID 500 ppm reading showing the top of the plume. The data indicate the plume spreads with depth and abruptly decreases in concentration. A true three-dimensional view of the plume would approach a 'teardrop' shape, with a flat base above the water table. **Figure 13** shows two wireframe maps constructed on the top and base of the PID 2000 readings, in an attempt to show the top and the base of the plume.

The shape of the plume shown in **Figures 6, 7,8, 9, 12** and **13**, indicates two sources of petroleum hydrocarbon constituents, likely a leak in the tank, and a leak in the piping leading to the gasoline dispenser. The plume extends deepest in the areas directly below the two sources.

Volumetric calculations were run in Surfer®. The thickness of impacted soil with a PID reading from 100 - 2000 shown in **Figure 15** –Isopach PID reading 100 - 2000 was input into a grid; the approximate volume of soil shown in **Figure 15** is 1516 cubic yards. A volumetric calculation of the grid created on the isopach (thickness) of the 2000 PID reading, gives a volume of 589 cubic yards. Of the calculated volume (589 cubic yards), only a portion of the impacted soil likely has a concentration of VOC's above the level of concern. The volumetric numbers are summarized as follows:

- PID reading 100 – 2000
- In-place calculated soil volume (Surfer®): cubic yards — 1546

- PID reading: 2000
- In-place calculated soil volume (Surfer®): cubic yards — 589

- Soil PID reading: 100 or greater
- Volume of soil removed: cubic yards — 256.43

- Soil PID reading: 500 or greater
- Volume of soil removed: cubic yards — 108.59

- Soil PID reading: 2000+
- Volume of soil removed: cubic yards — 91.58

- Total volume of soil removed during remediation: cubic yards — 540.34

4.3 Soil Analytical Results

Soil samples were collected for laboratory analysis from 10 locations as shown on **Figure 14**. The laboratory analytical results are shown in **Table 4.3**, below.

Table 4.3
Mardikian Remediation Soils Analytical Results

Hole Number	Hole Location	Sample Depth (feet bgs)	PID Reading VOC's[2]	**BENZENE**	Toluene	Ethyl-benzene	M,p, &o Xylenes	MTBE	TPHg[1]
				EPA Method 8260B					EPA Method 8015M
				Units mg/Kg					
				RL*0.05	RL*0.05	RL*0.05	RL*0.05	RL*0.05	DL*0.30
2	E-5	65	10	<0.05	<0.05	<0.05	<0.05	0.48	0.62
7	H-11B	45	95	<0.05	<0.05	<0.05	<0.05	0.09	1.1
5	H-8	65	84	<0.05	<0.05	<0.05	<0.05	0.68	.52
15	F-10	70	53	<0.05	<0.05	<0.05	<0.05	0.61	<0.30
16	E-10	55	24	<0.05	<0.05	0.07	<0.05	0.39	.69
17	E-8/9	65	40	<0.05	<0.05	<0.05	<0.05	0.38	<0.30
21	B-6	65	4.9	<0.05	<0.05	<0.05	<0.05	0.15	<0.30
25	I-6	65	55	<0.05	<0.05	<0.05	<0.05	0.51	0.73
26	I-8	65	29.1	<0.05	<0.05	<0.05	<0.05	0.58	0.53
29	E-4	60	32.0	<0.05	<0.05	<0.05	<0.05	0.11	<0.30

[1] – TPHg result does not include MTBE
[2] – PID Photo Ionization Detector, VOC's- Volatile Organic Compounds
RL – Reporting Limit, mg/Kg
DL – Detection Limit, mg/Kg
<0.05 – Compound not detected above the reporting limit, or above the detection limit.
0.61 – Concentration of Chemical of Concern in mg/Kg reported above DL/RL

The soil analytical data was input into the Groundwater Services, Inc. RBCA Tool Kit modeling software to determine the fate and transport of the remaining soil contamination and to determine the risk to human health.

5.0 GROUNDWATER ANALYSIS

Monitoring well MW-1 was abandoned on April 1, 2005 in preparation for remediation at the Site. Monitoring well construction details are given in **Table 5.1A**. Historical groundwater elevation data are shown in **Table 5.1B**. Groundwater samples were collected from the three remaining monitoring wells, MW-2, MW-3, and MW-4 on April 18, and again on May 4, 2005. The results of groundwater analysis, together with previous monitoring event results are given below in **Tables 5.1C.**

5.1 Groundwater Analytical Results

Table 5.1A - Groundwater Monitoring Well Construction Details

Monitoring Well	Measuring Point Elevation * Feet	Approximate Topographic Elevation (feet MSL) **	Boring Depth/ Well Depth (feet bgs)	Screen Interval (feet bgs)	Depth of Seals (feet bgs)
MW-1	101.5	321.50	95/92	92-61	32.5
MW-2	103.21	323.21	85/85	85-65	63
MW-3	102.59	322.59	87.5/86	86-66	64
MW-4	101.83	321.83	87/85	85-65	63

Notes:
* Top of casing elevations based on assumed Relative Datum set by Smith Company Surveying Services, Inc.; May 10, 2002 (Appendix A).
** Approximate elevation of top of casing assumes Relative Datum elevation of 320 feet MSL based on USGS Topographic Map, Delano East 7.5 min Quadrangle (see Figure 1).
MSL – mean sea level bgs – below ground surface
Depth of seal - the depth from surface to the base of cement/bentonite seal and hydrated bentonite chips observed during construction of the well. Depths are also the top of filter sand.

Table 5.1B – Historical Groundwater Elevations

Date Measured	Groundwater Elevations (feet MSL)*			
	MW-1	MW-2	MW-3	MW-4
8/22/01	251.74	**	**	**
5/16/01	249.8	250.21	249.34	249.68
11/19/02	249.1	249.41	248.09	249.03
4/07/03	248.0	248.6	247.69	247.93
8/20/03	247.6	248.26	246.69	247.73
7/23/04	244.5	246.2	245.2	245.3
4/18/05	--	244.61	243.54	243.77
5/4/05	--	244.51	243.46	243.70

Notes:
* - Elevations calculated based on top of casing reference points surveyed relative to assumed site datum and regional topographic map, not absolute MSL data (See Table 5.1A for details).
** - Well not yet installed.
*** - Well abandoned April 1, 2005

- **TABLE 5.1C – Summary of Groundwater Analytical Results - Petroleum Constituents**

Well ID	Sampling Date	Ground -water Elev. Ft	TPHg (μg/L)	Benzene (μg/L)	Toluene (μg/L)	Ethyl-benzene (μg/L)	Xylenes (μg/L)	MTBE (μg/L)
MW-1	**8/22/01**	251.74	**27,000**	**1000**	**7500**	**970**	**5600**	**160**
	5/17/02	249.8	**11,000**	**200**	ND(0.5)	**240**	**1900**	**110**
	11/19/02	249.1	**5,200**	**150**	**410**	**140**	**870**	**170**
	4/07/03	248.0	**4,500**	**20**	**150**	**95**	**620**	**130**
	8/20/03	247.6	**2,500**	**190**	**170**	**48**	**300**	**120**
	7/23/04	244.5	**870**	**17**	**6.9**	**21**	**110**	**22**
MW-2	**5/16/02**		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.0)	ND(0.5)
	11/19/02		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.0)	ND(0.5)
	4/07/03		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	**0.5**
	8/20/03		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.0)	ND(0.5)
	7/23/04		ND(50)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.6)	ND(1)
	4/18/05	244.61	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
	5/4/05	244.51	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
MW-3	**5/16/02**		**81**	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.0)	**160**
	11/19/02		**200**	**2.1**	ND(0.5)	ND(0.5)	**1.6**	**240**
	4/07/03		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	**49**
	8/20/03		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.0)	**16**
	7/23/04		**100**	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.6)	**82**
	4/18/05	243.54	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	**48**
	5/4/05	243.46	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	**44**
MW-4	**5/16/02**		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.0)	ND(0.5)
	11/19/02		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.0)	ND(0.5)
	4/07/03		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
	8/20/03		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.0)	ND(0.5)
	7/23/04		ND(50)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.6)	ND(1)
	4/18/05	243.77	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
	5/4/05	243.70	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
Domestic Well	**11/19/02**		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.0)	ND(0.5)
	4/07/03		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.0)	ND(0.5)
	8/20/03		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.0)	ND(0.5)

Notes:
Monitoring Well MW-1 was abandoned on April 1, 2005.
Groundwater samples analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg) by Modified EPA Method 8015 and for petroleum hydrocarbon constituents benzene, toluene, ethylbenzene, xylenes, and methyl t-butyl ether (MTBE) by EPA Method 8020 and 8260b. Only those compounds detected one or more times are listed in this table.

Notes continued:
Elevation of groundwater is measured in feet above mean sea level.
Sampling of the Domestic Well has been deleted from the monitoring program in accordance with RWQCB approval.
TPHg – Total Petroleum Hydrocarbons reported as Gasoline Range Organics (C4-C12).
MTBE – Methyl t-butyl ether
TBA – t-Butyl alcohol
(μg/L) – micrograms/Liter (ppb)
ND (0.5) – not detected at practical quantitation limit shown in parentheses.

5.2 Discussion of Groundwater Monitoring Results

Table 5.1C contains a summary of groundwater analytical results. The most recent laboratory results are also presented in **Appendix D.** Groundwater elevation contours and flow direction for the April and May 2005 sampling events are shown on **Figures 16 and 17**.

Groundwater analytical results from samples collected from the groundwater monitoring wells show that MTBE was detected at a concentration of 48 μg/l in monitoring well MW-3 on April 18, 2005, decreasing to a concentration of 44 μg/l on May 4, 2005. No other chemicals of concern were detected in the monitoring wells.

Groundwater elevation maps shown in **Figures 16** and **17** show a slight drop in groundwater elevation between the two recent monitoring events, April 18, 2005 and May 4, 2005. The groundwater elevation is approximately 2-feet higher than July 2004, the last monitoring event. The groundwater gradient, 0.075 ft/ 100 ft, and direction, west-northwest are consistent between the monitoring events, and historical monitoring.

6.0 RBCA SITE ASSESSMENT

A Risk-Based Corrective Action (RBCA) model was run using Groundwater Services, Inc. RBCA Tool Kit for Chemical Releases. Data from the borehole soils analysis and the groundwater monitoring well water analysis were loaded into the model. Receptors modeled water supply well were the on-site well, outdoor air inhalation, and soil leaching to groundwater. The Input Parameter Summary and Exposure Pathway Flowcharts are included as **Figures 17** and **18**.

Chemicals of concern modeled were Benzene, Ethylbenzene, Xylene (mixed isomers), Toluene and Methyl t-Butyl ether (MTBE).

The Baseline Risk Summary-All Pathways (**Figure 19**) demonstrates that based on the two exposure pathways considered, outdoor air exposure and groundwater exposure do not result in Risk or Toxicity limits exceeded.

A printout of the Tier 2 Tranisent Domenico Analysis of Benzene and MTBE in soils leaching to groundwater with 1st order biodegredation applied to the model is included in **Figures 20** and **21**. The concentration of both Benzene and MTBE attenuate rapidly with distance from the source, and at 200 feet from the source the concentration of these chemicals will remain at zero in the soils.

The Tier 2 Transient Domenico Analysis of MTBE in affected groundwater with a 1st order biodegredation (**Figure 22**) applied to the model demonstrates that the concentration of MTBE modeled in groundwater at 400 feet from the source will reach a steady state of 0.003 mg/l (3.2 μg/l) a concentration well below the primary Maximum Contaminant Level (MCL) of 13 μg/l, and well below the Point of Exposure Concentration Limit of .037 mg/l.

7.0 SUMMARY

The corrective action project at the Mardikian Site removed 540 cubic yards of soil. 256 cubic yards of the soil, or 47 % of the soil removed, had a PID reading of 100 – 2000+. The impacted soil removed was replaced by clean soil, thereby removing soil containing chemicals of concern that could potentially be leached into the groundwater underlying the Site.

Two groundwater-monitoring cycles were performed. The first occurred on April 18, 2005 during the soil remediation project; the second groundwater samples were collected on May 4, 2005, 12 days after completion of the soil removal. A decrease in the concentration of MTBE from 48 μg/l to 44 μg/l of MTBE was noted in monitoring well MW-3, the only impacted groundwater monitoring well.

The concentrations of chemicals of concern have decreased since monitoring began in August 2001, and likely will continue to decrease. This is due to three factors:

1. The initial source of contamination, the underground tank and associated piping has been removed.

2. The hydrocarbons remaining in the soil have been adsorbed by the soil and have been subject to biodegradation, and downward leaching has been reduced by the presence of an asphalt cap over a portion of the area.

3. 256 cubic yards of impacted soil have been removed from the source area.

Contours of groundwater elevation from both monitoring events are consistent and show that the contaminated groundwater flows away from the on-site domestic well.

A RBCA model based on analysis of soil samples from 10 of the boreholes and from analysis of groundwater past and present from monitoring wells MW-1 and MW-3, demonstrates that there is not risk to the on-site domestic well and no risk to soils leaching to groundwater beyond 200 feet from the source.

8.0 RECOMMENDATIONS

On behalf of the responsible party Mr. Archie Mardikian, RAM requests a written closure letter for the Site based on the following:

- A significant portion of impacted soil that was threatening groundwater underlying the Site has been removed and, which could not be removed
- Impacted Soils left in place which could not be removed are confined and
- concentrations of chemicals of concern in groundwater at the Site have steadily decreased over four years and will likely continue to decrease with natural attenuation. Removal of source material will increase the rates of natural attenuation and,
- the RBCA model demonstrates that the concentration of MTBE in the groundwater will not extend beyond 400 feet from the source, and the concentration of MTBE in affected groundwater will reach a steady-state concentration of 3.2 µg/l, and,
- the groundwater flow direction is away from the on-site domestic well, and
- prior investigations show no water supply wells within ¼ mile of the Site in cross-gradient or down-gradient direction.
- Impacted Soils have been deposited above ground with a 6" clean soil cap to naturally bio-remediate. Soils have shown very low VOC's 7' below grade, and zero at grade.

RAM recommends that the RWQCB review this Report of the CAP Implementation, and concur with RAM's Staff that no further action is warranted on this site for the protection of the publics health and the groundwater resources of the state.

9.0 LIMITATIONS

RAM Environmental Engineering Services, Inc. has prepared this Report for the exclusive use of Mr. Archie Mardikian as it pertains to the Mardikian property located in Delano, California. Our professional services have been performed using the degree of care and skill ordinarily exercised under similar circumstances by other geologists and professionals practicing in this field. No other warranty, expressed or implied, is made as to the professional advice in the Report. Any use of or reliance on this Report by a third party shall be at such party's sole risk.

RAM assumes no responsibility for site conditions or activities that were outside the scope of the work requested by Mr. Mardikian. It is recognized that regulatory requirements may change, including the revision of accepted action levels, which could necessitate a review of the discussion, findings, recommendations or opinions stated in the Report.

10.0 SIGNATURE PAGE

This Groundwater Monitoring Report for Mr. Archie Mardikian, dated May 2005 was prepared by RAM Environmental Engineering Services, Inc. under the responsible charge of the following professionals:

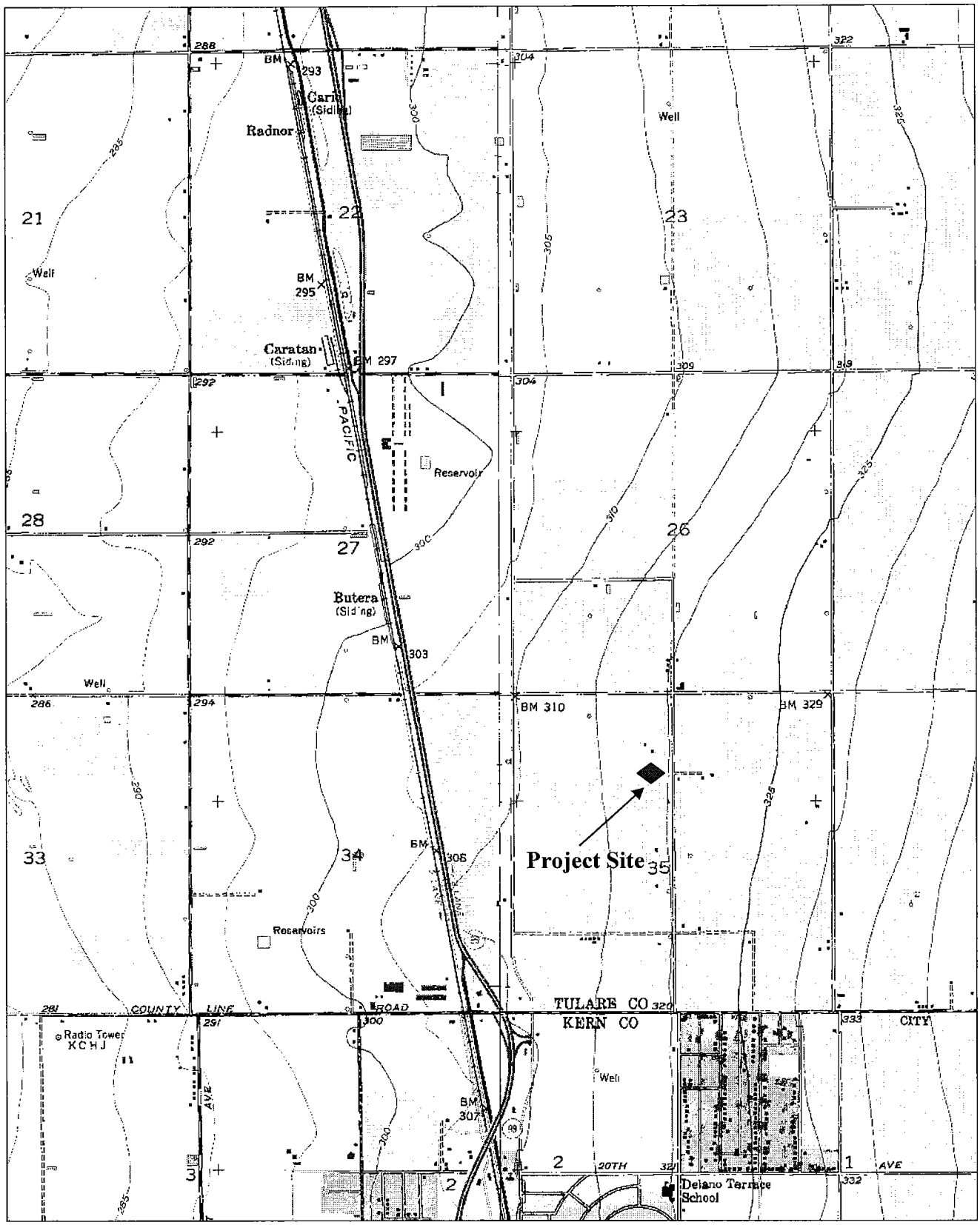
REPORT PREPARED BY:

M. Jane Ellis-McNaboe
Registered Geologist, No. 4127

REPORT REVIEWED BY:

Richard M. Casagrande, REHA

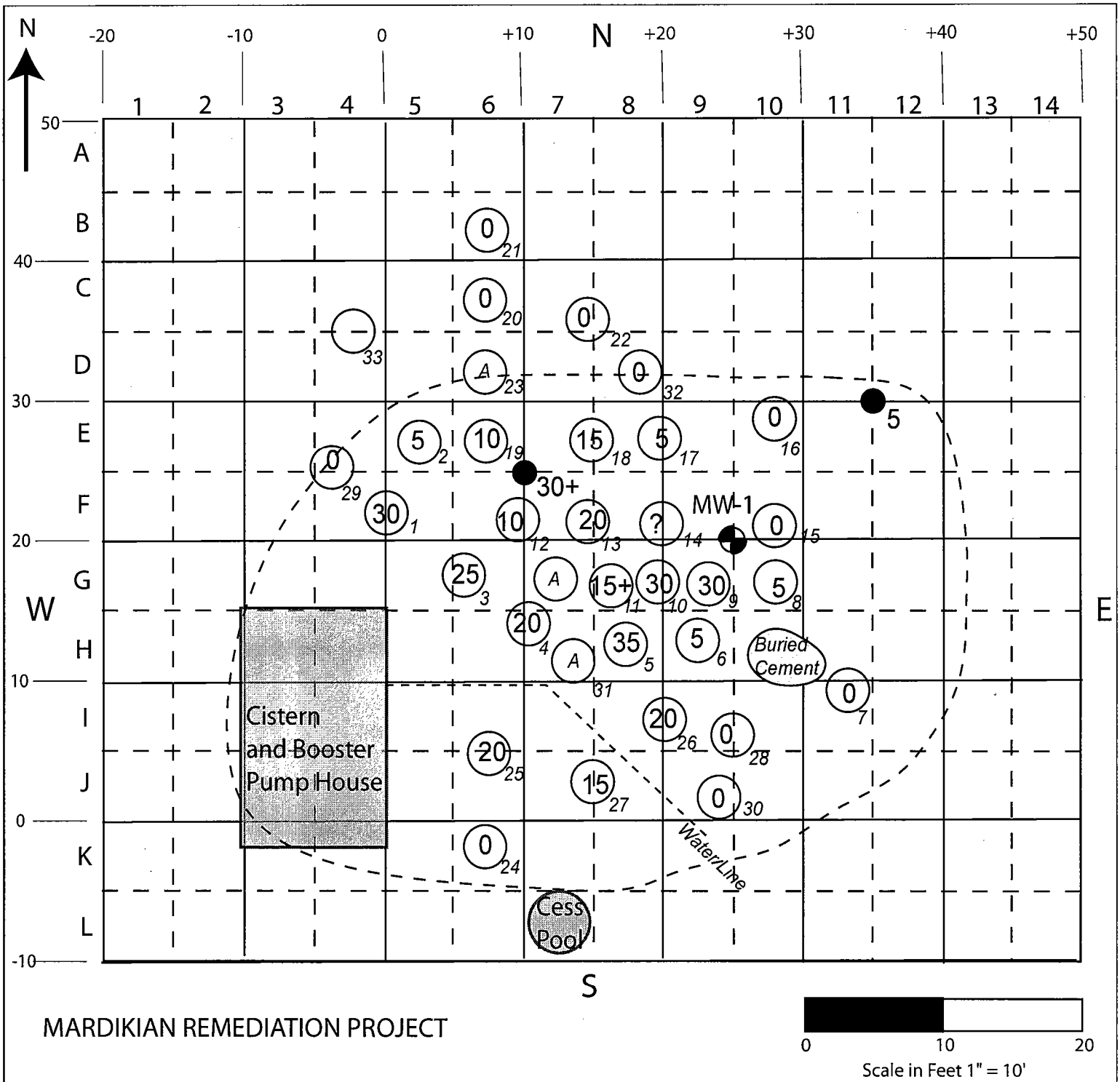
FIGURES



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 742 ft Scale: 1 : 25,000 Detail: 13-0 Datum: WGS84

Mardikian Property **Tulare County, California**	**Figure 1** **Site Location Map**	**RAM** ENVIRONMENTAL ENGINEERING SERVICES, INC. **Project No.:** 200102A **Date:** May 05

2000_05_102A_Q303F1

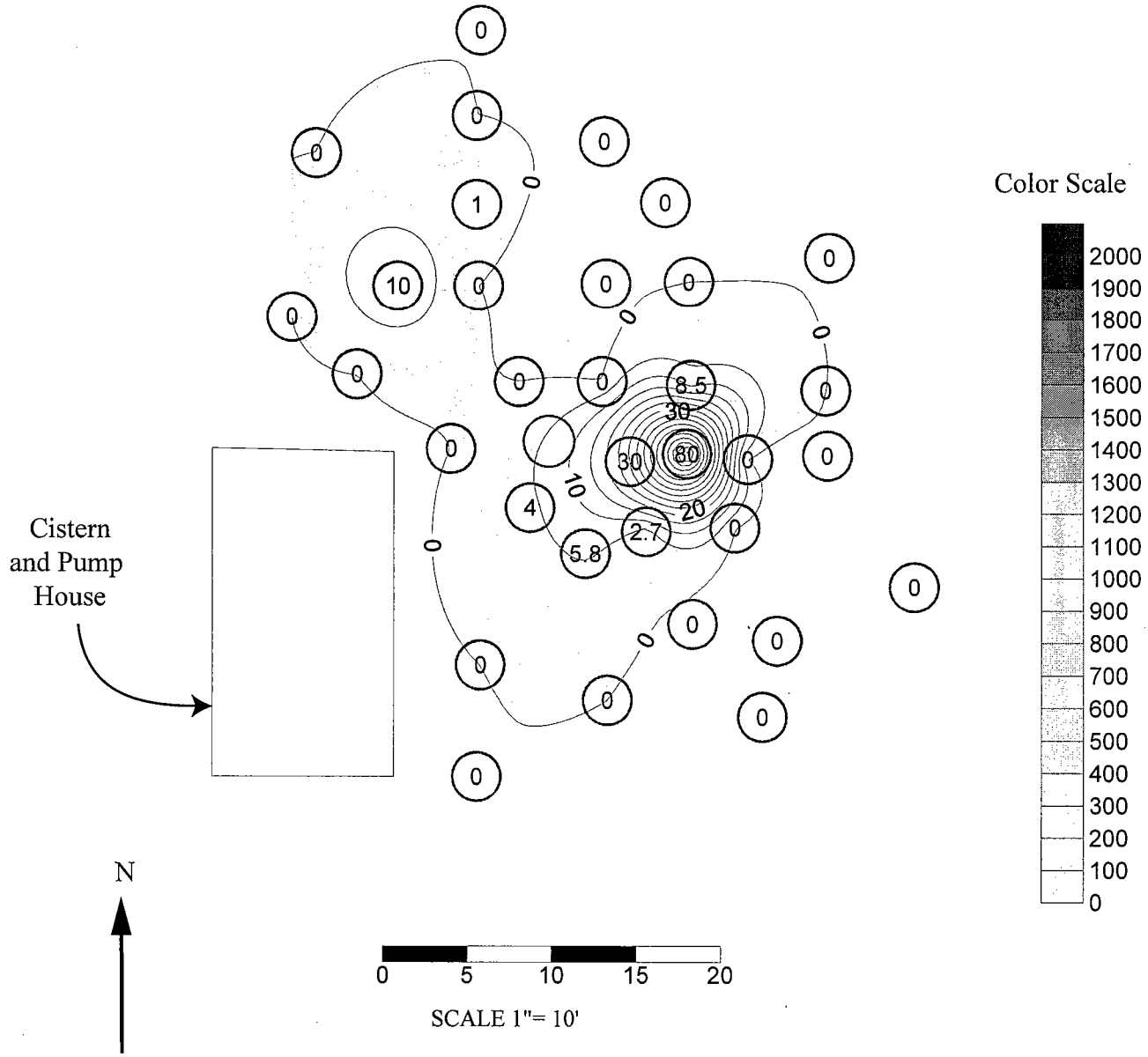


LEGEND

30 BOREHOLE LOCATION BOREHOLE NUMBER	(A) BOREHOLE ABANDONED DUE TO COLLAPSE

MAY 2005 PROJECT 2000102A	FIGURE 2 **BOREHOLE LOCATION MAP**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S. 35, T.24S, R.25E	2103 20th STREET BAKERSFIELD, CA.

2000_05_102_hole location map

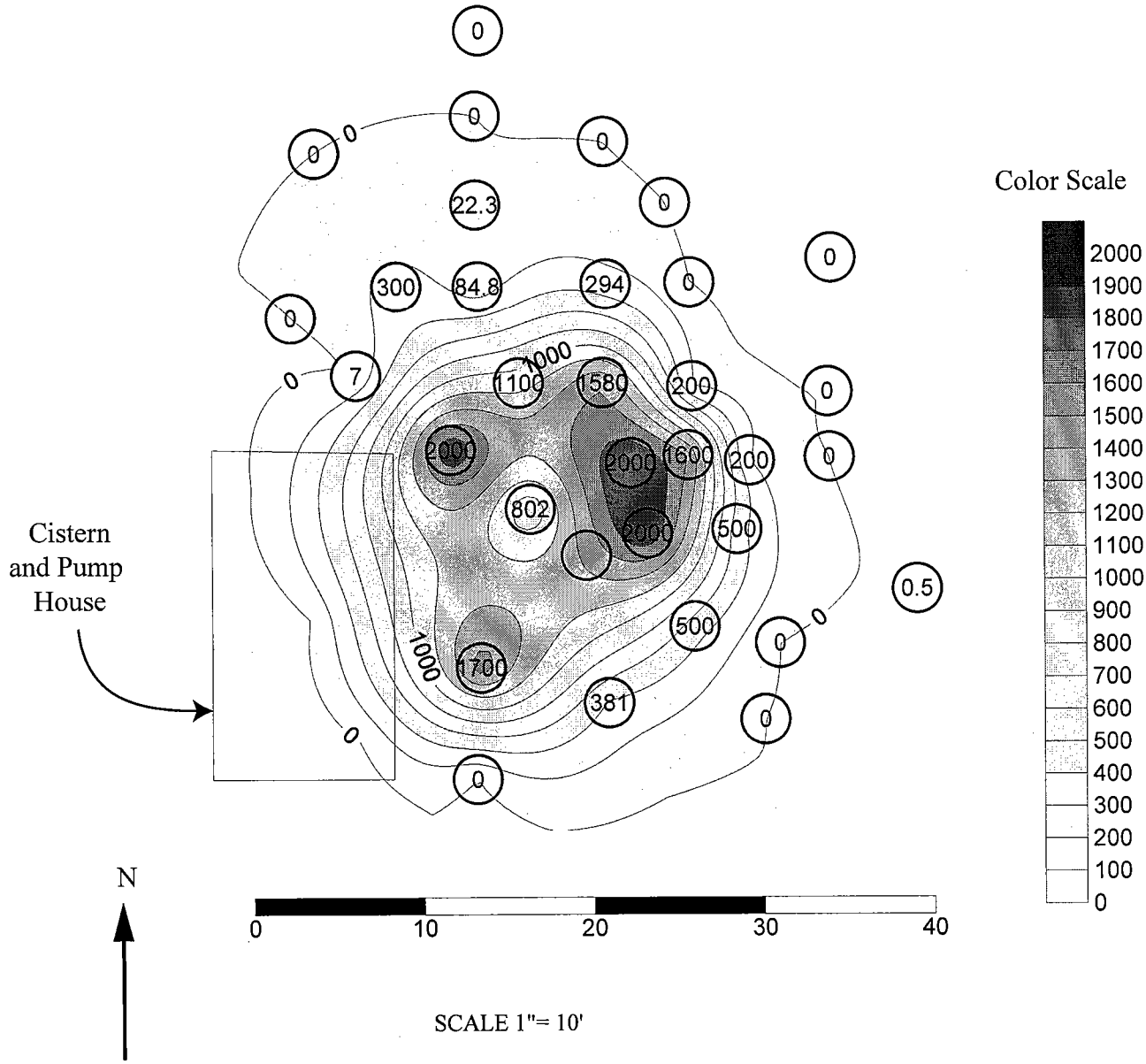


LEGEND

Borehole Location

PID Reading ppm VOC

MAY 2005 PROJECT 2000102A	FIGURE 3 **Contours PID Reading 10 - feet Below Ground Surface**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.

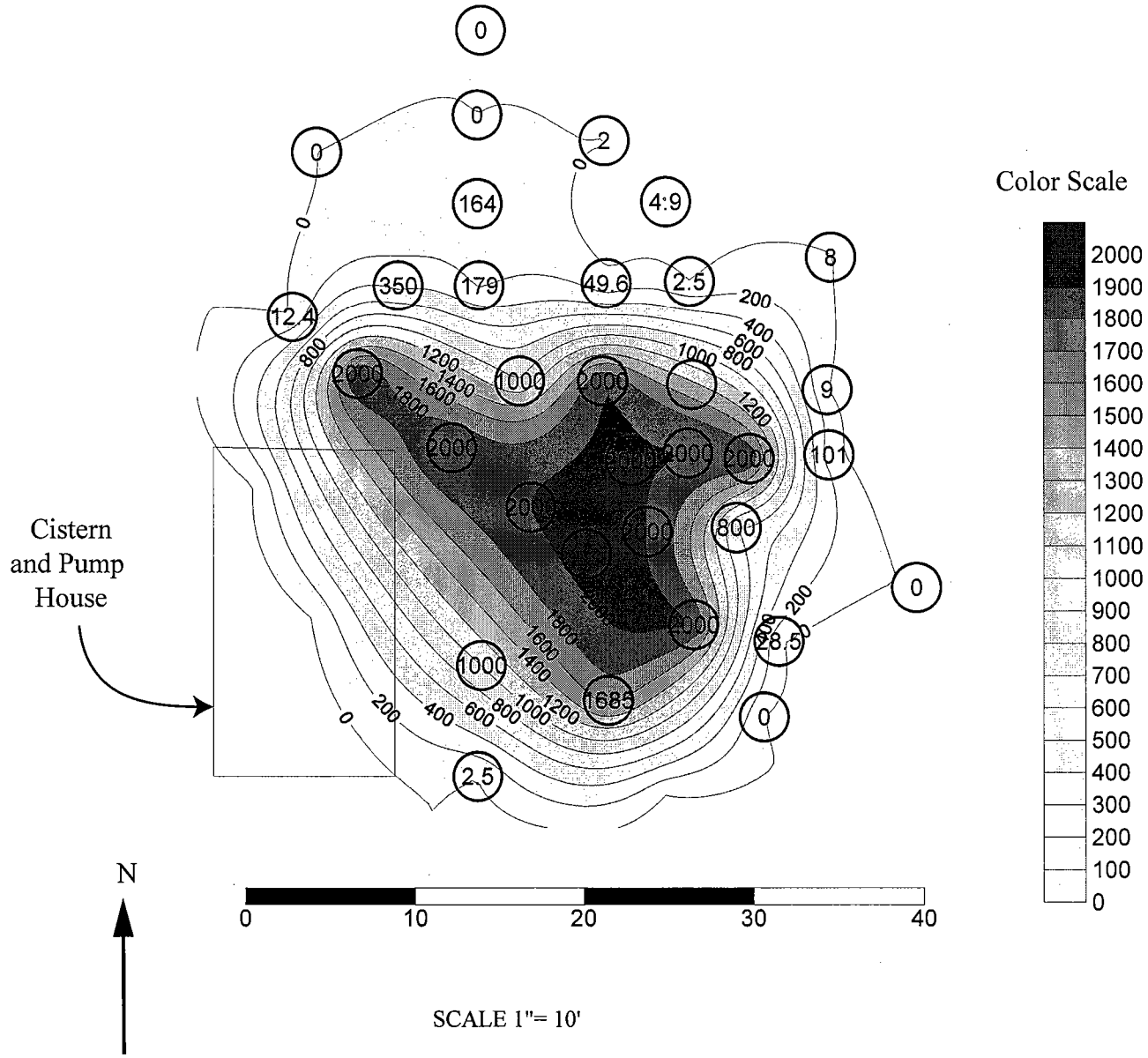


LEGEND

Borehole Location

PID Reading ppm VOC

MAY 2005 PROJECT 2000102A	FIGURE 4 **Contours PID Reading** **20 Feet Below Ground Surface**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.

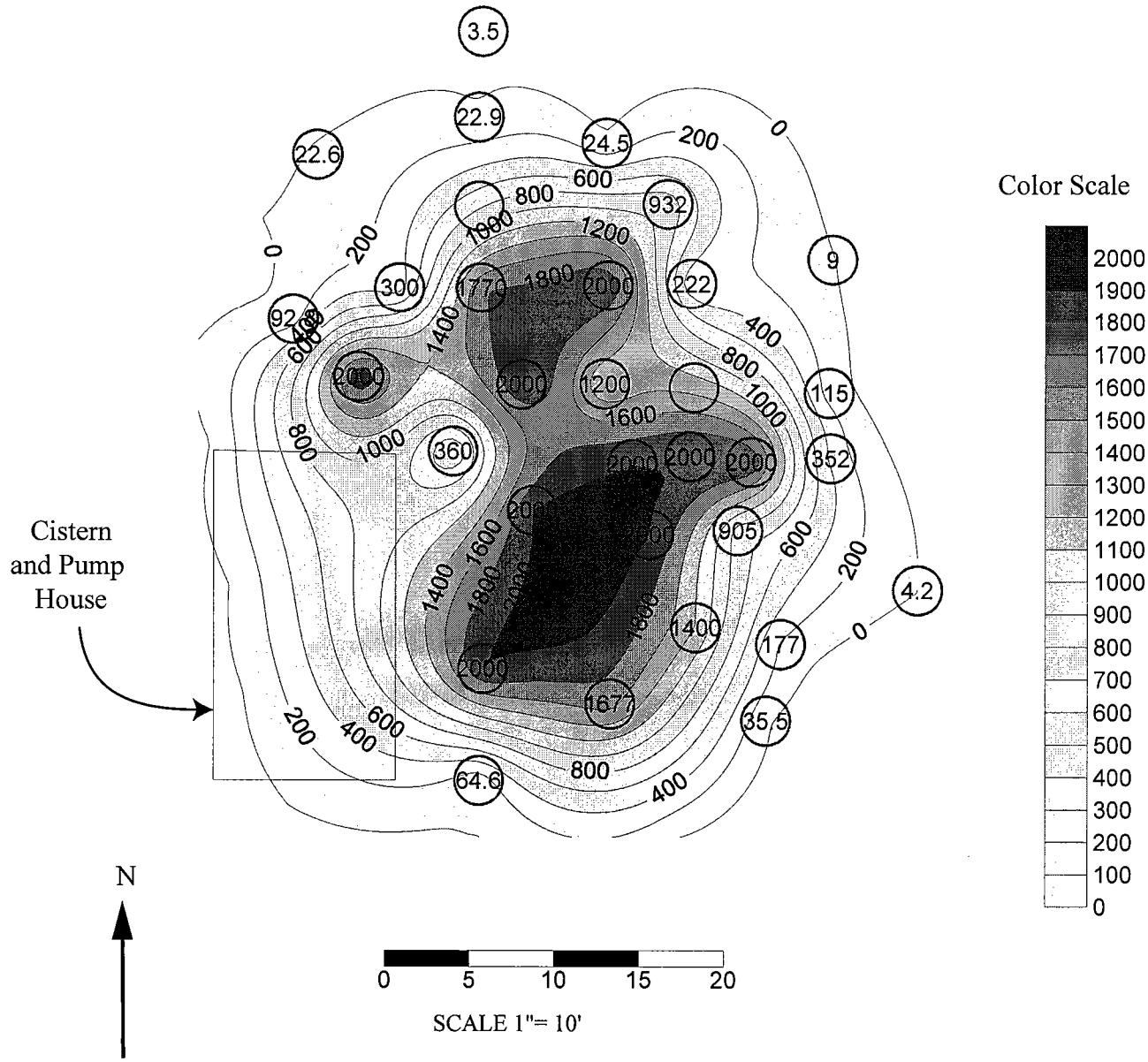


LEGEND

Borehole Location

PID Reading ppm VOC

MAY 2005 PROJECT 2000102A	FIGURE 5 **Contours - PID Reading 30-Feet Below Ground Surface**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.

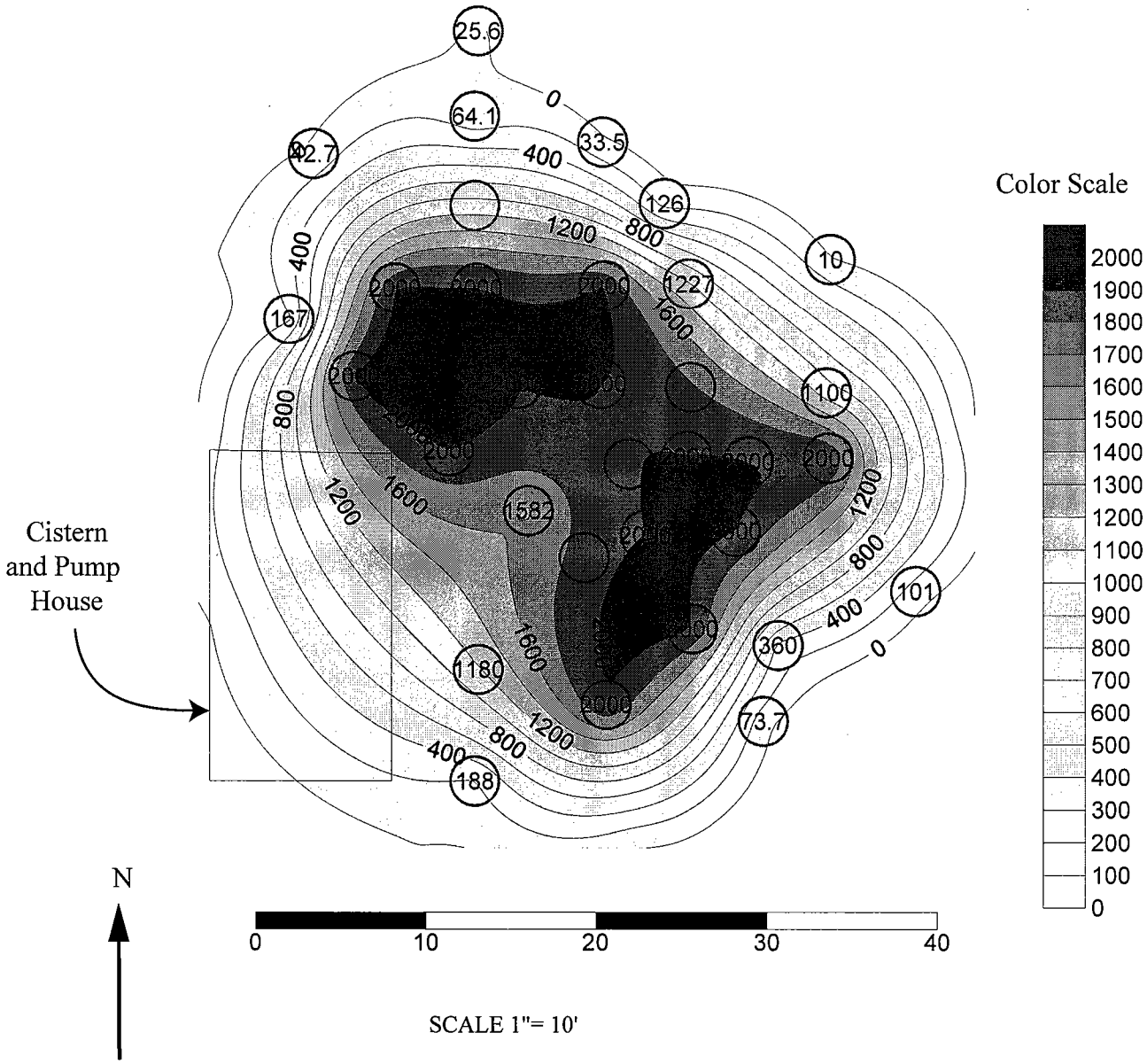


LEGEND

Borehole Location

0 PID Reading ppm VOC

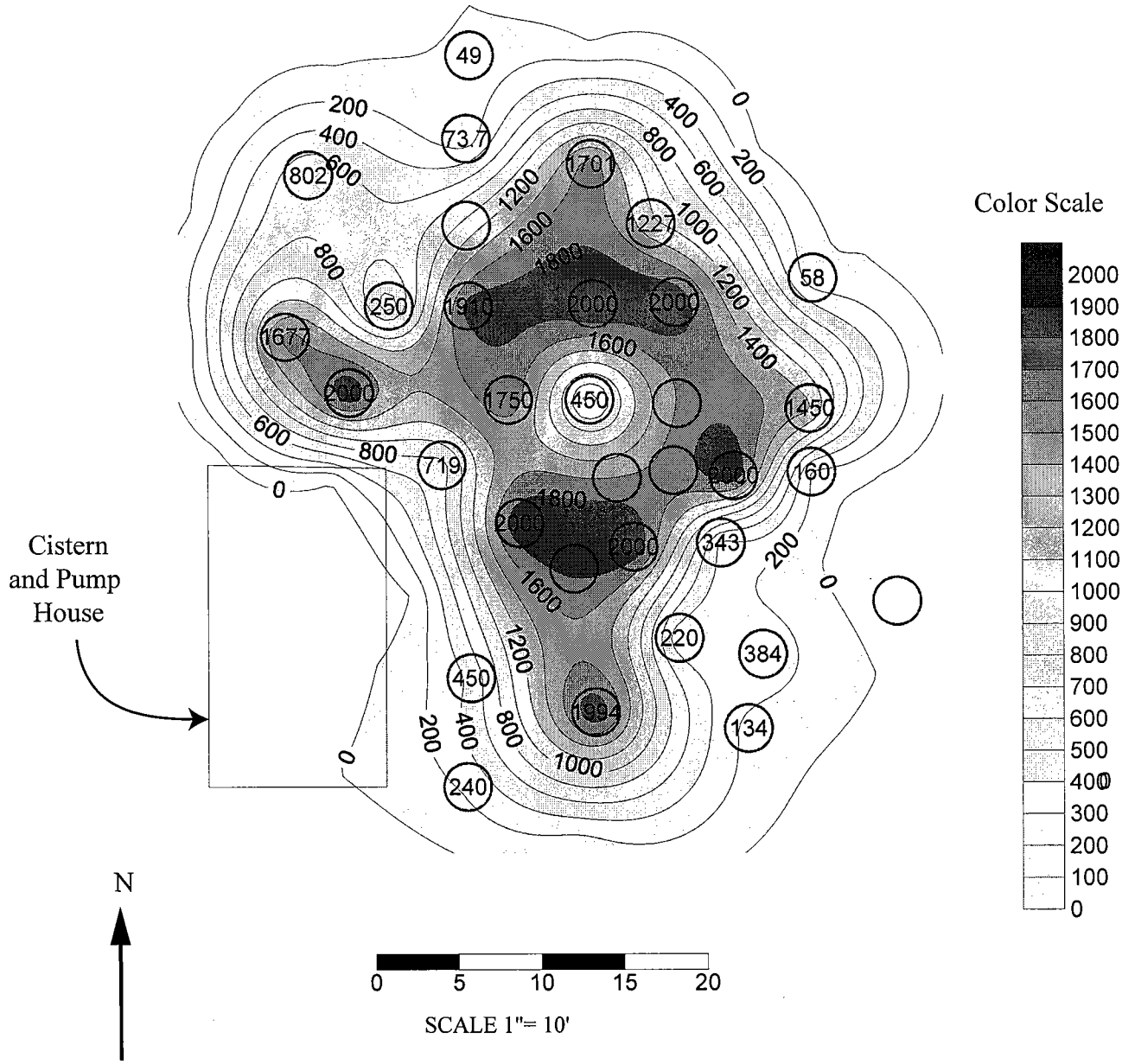
MAY 2005 PROJECT 2000102A	FIGURE 6 **Contours PID Reading 35 - feet Below Ground Surface**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.



LEGEND

0 — Borehole Location
PID Reading ppm VOC

MAY 2005 PROJECT 2000102A	FIGURE 7 **Contours PID Reading** **40 Feet Below Ground Surface**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.

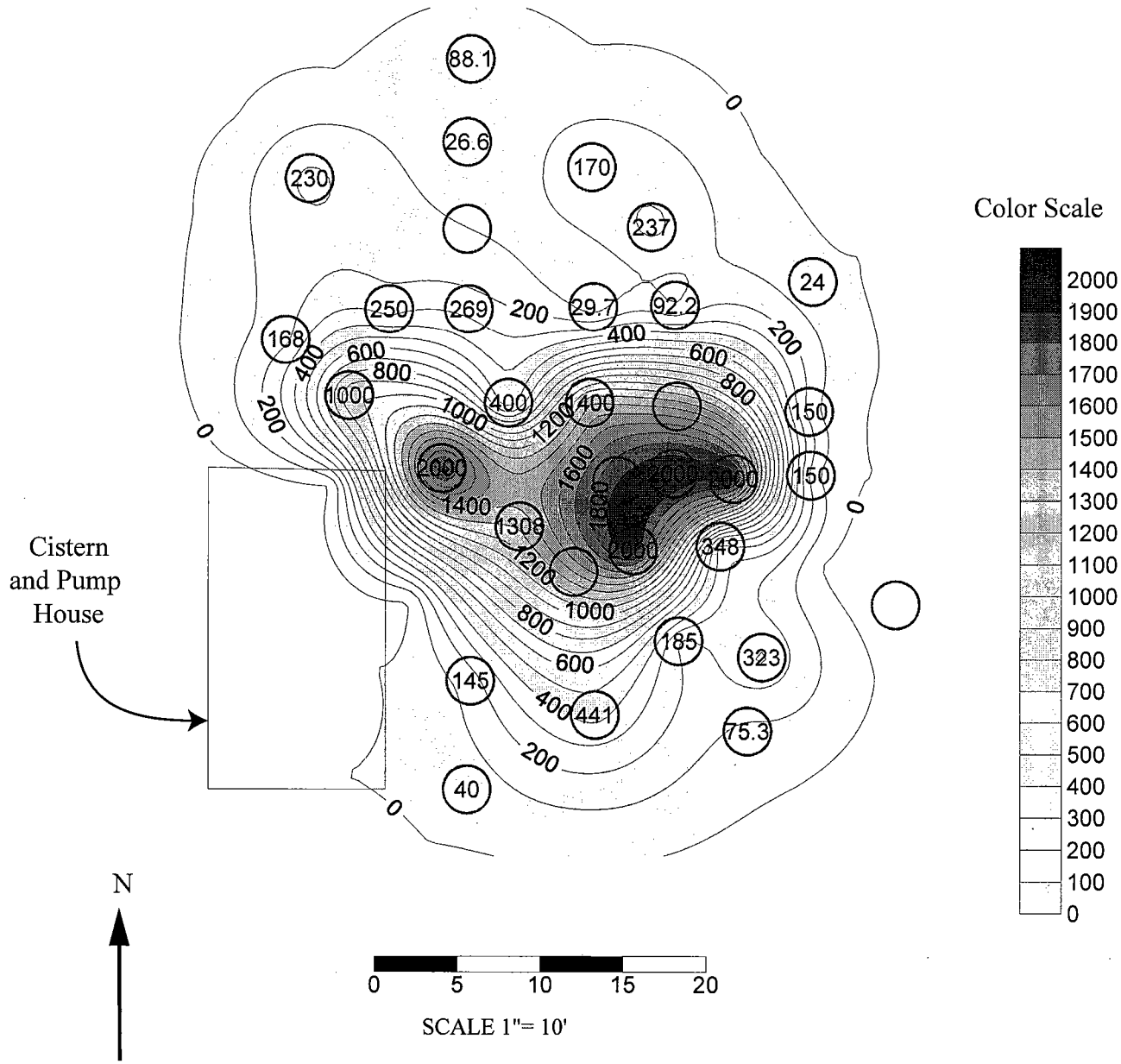


LEGEND

Borehole Location

PID Reading ppm VOC

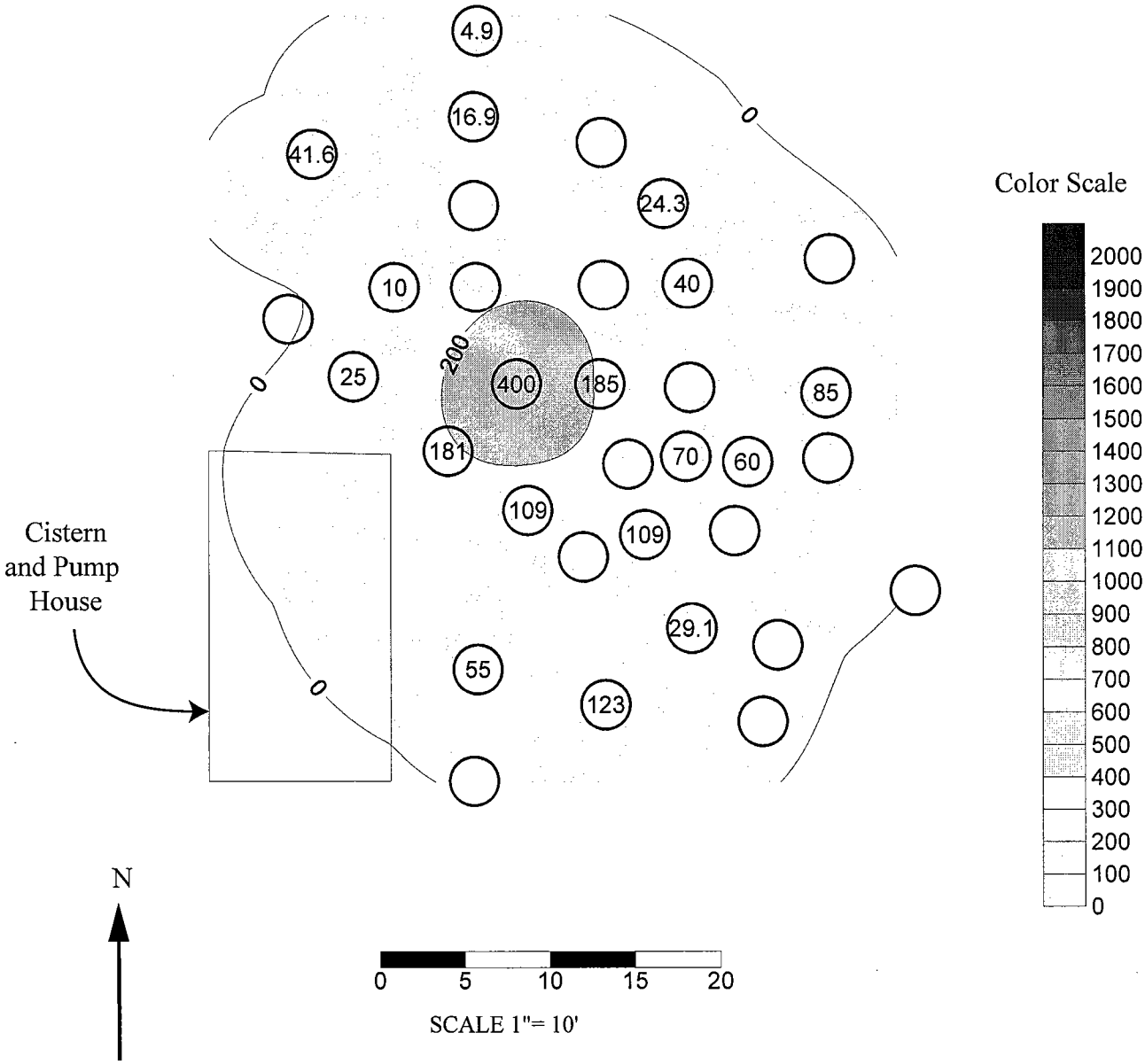
MAY 2005 PROJECT 2000102A	FIGURE 8 **Contours PID Reading 50 - feet Below Ground Surface**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.



LEGEND

0 — Borehole Location
PID Reading ppm VOC

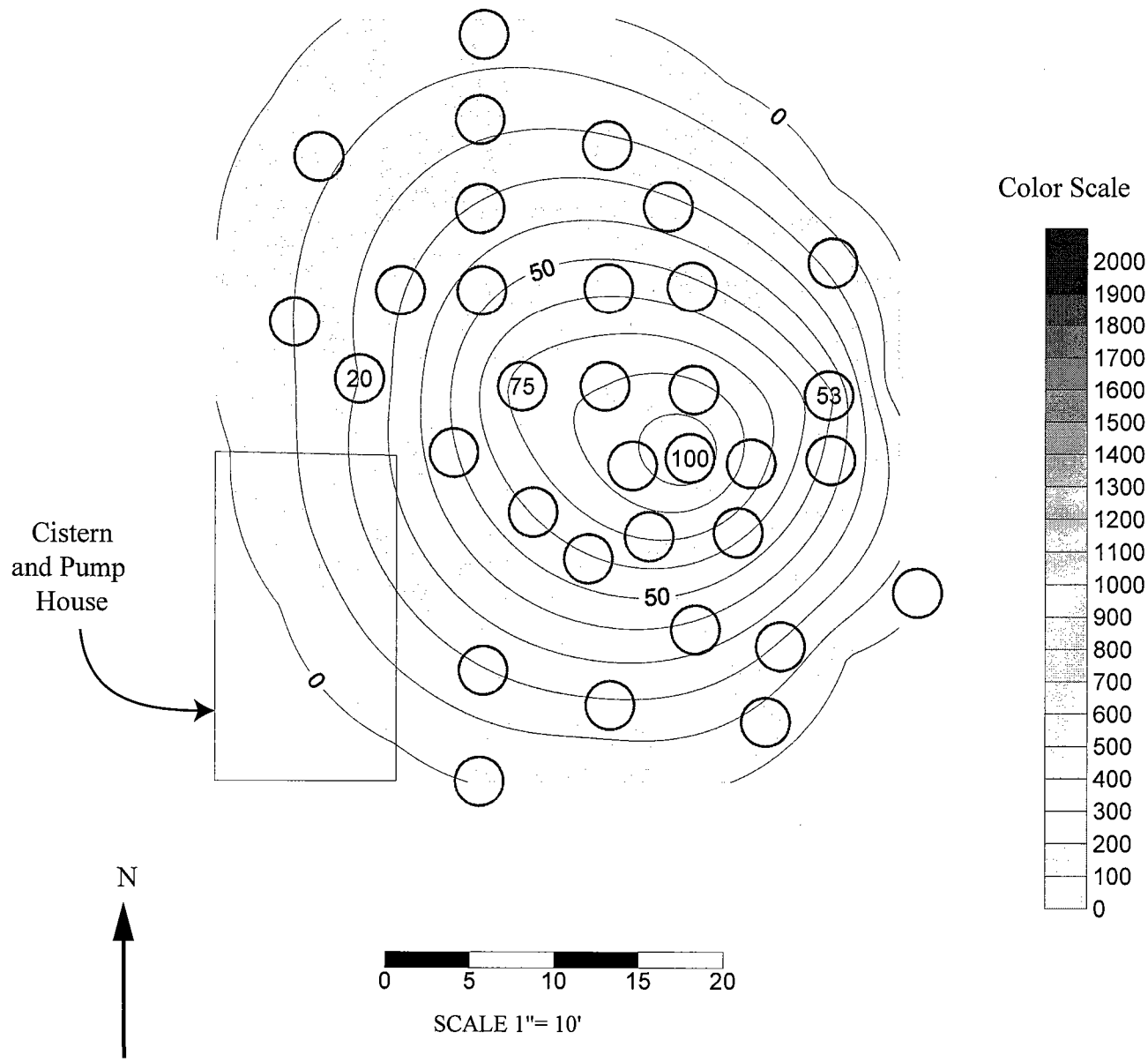
MAY 2005 PROJECT 2000102A	FIGURE 9 **Contours PID Reading 55 - feet Below Ground Surface**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.



LEGEND

0 — Borehole Location
PID Reading ppm VOC

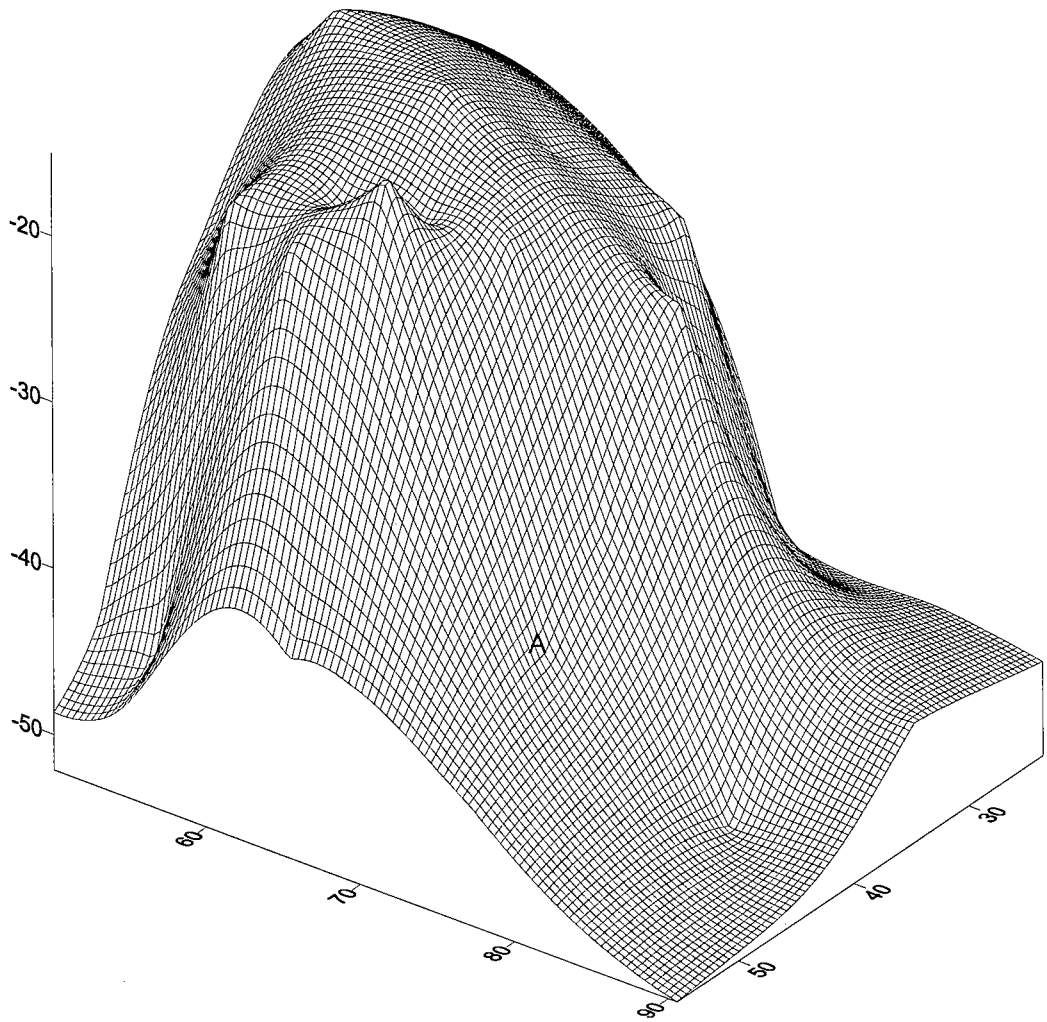
MAY 2005 PROJECT 2000102A	FIGURE 10 **Contours PID Reading 65 - feet Below Ground Surface**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.



LEGEND

0 — Borehole Location
PID Reading ppm VOC

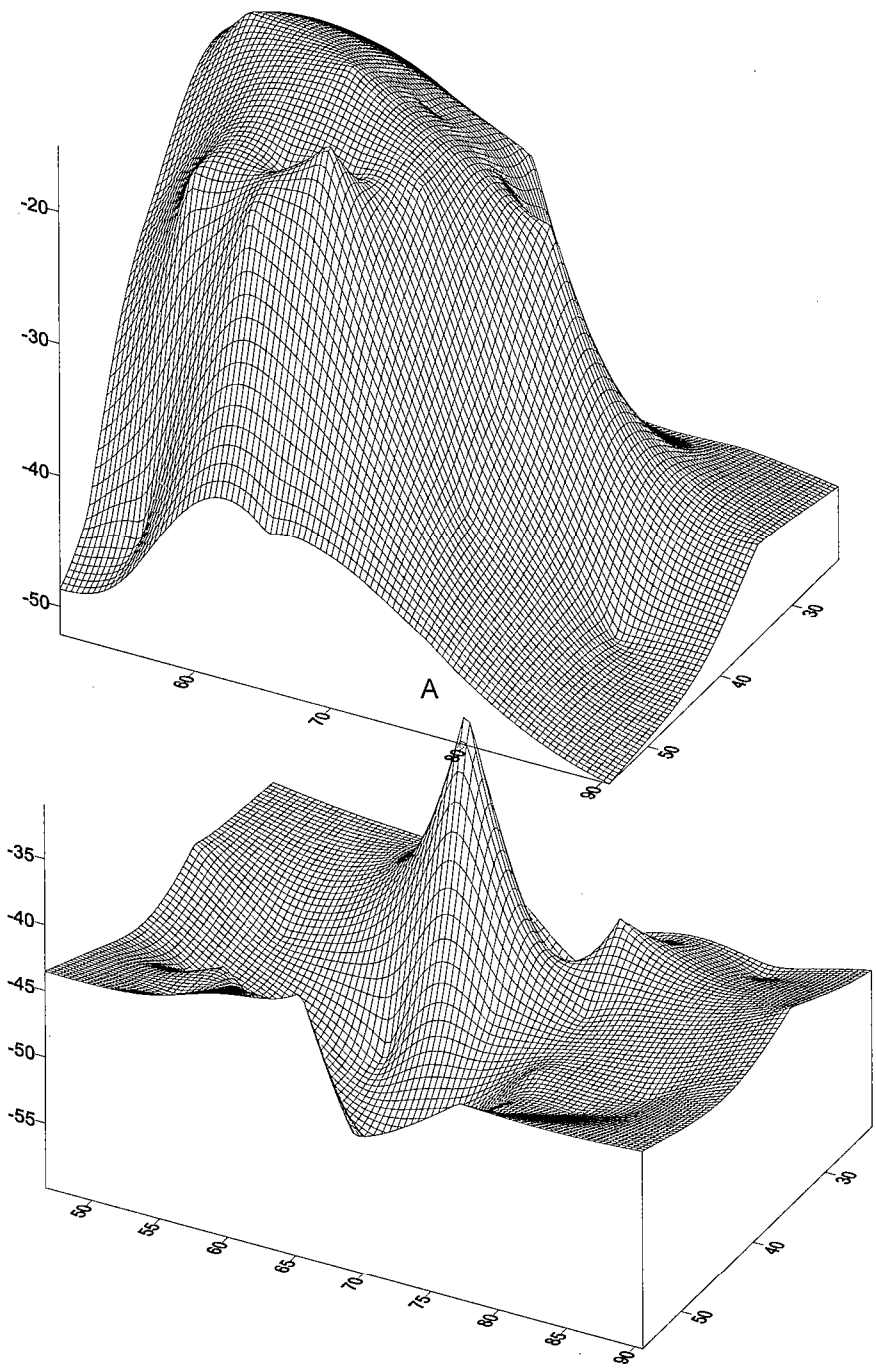
MAY 2005 PROJECT 2000102A	FIGURE 11 **Contours PID Reading** **70 Feet Below Ground Surface**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.



Wireframe Map - Depth to PID 500 reading

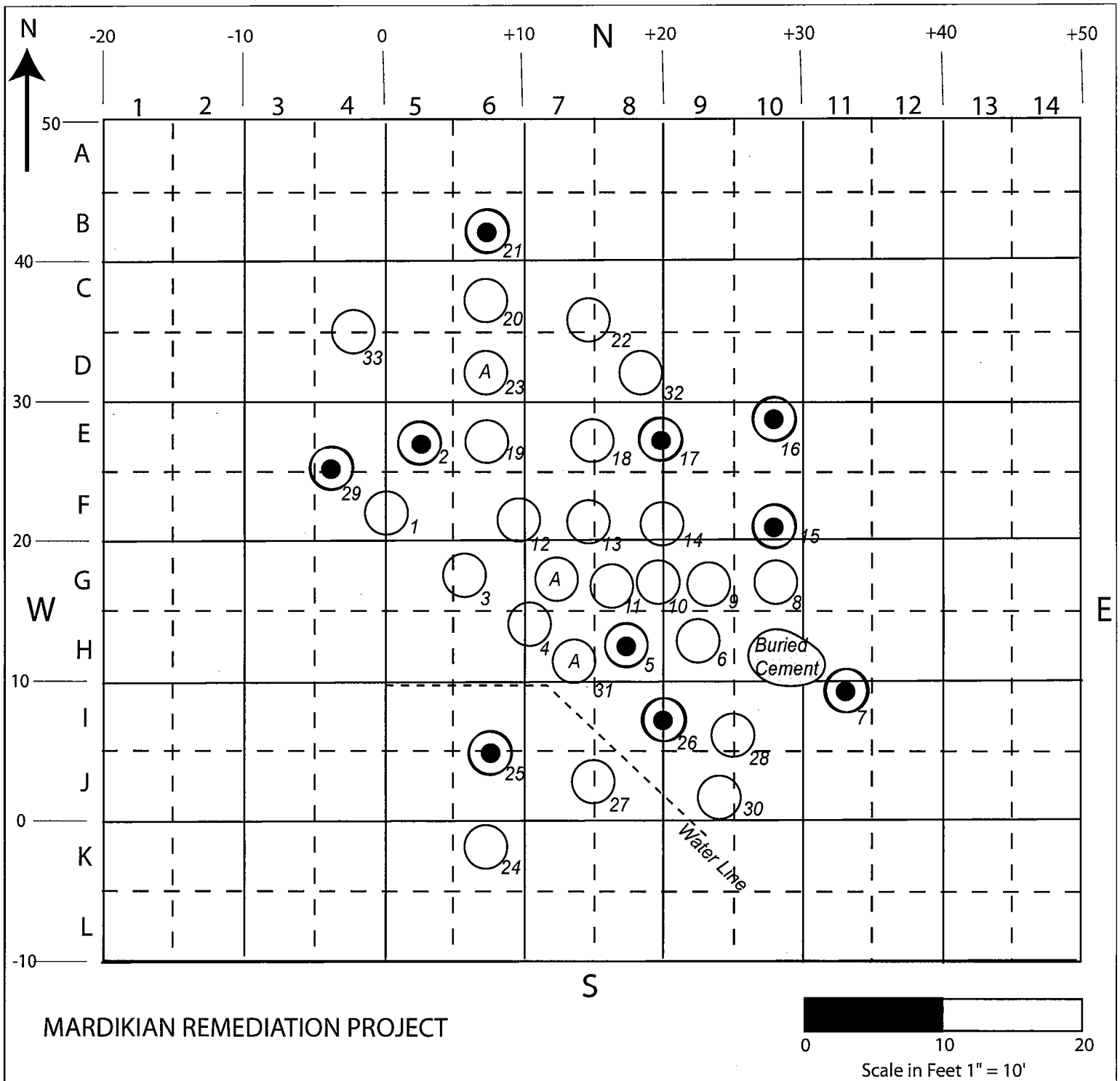
LEGEND

MAY 2005 PROJECT 2000102A	FIGURE 12 **WIREFRAME MAP** **TOP OF PID 500 ZONE**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.



LEGEND

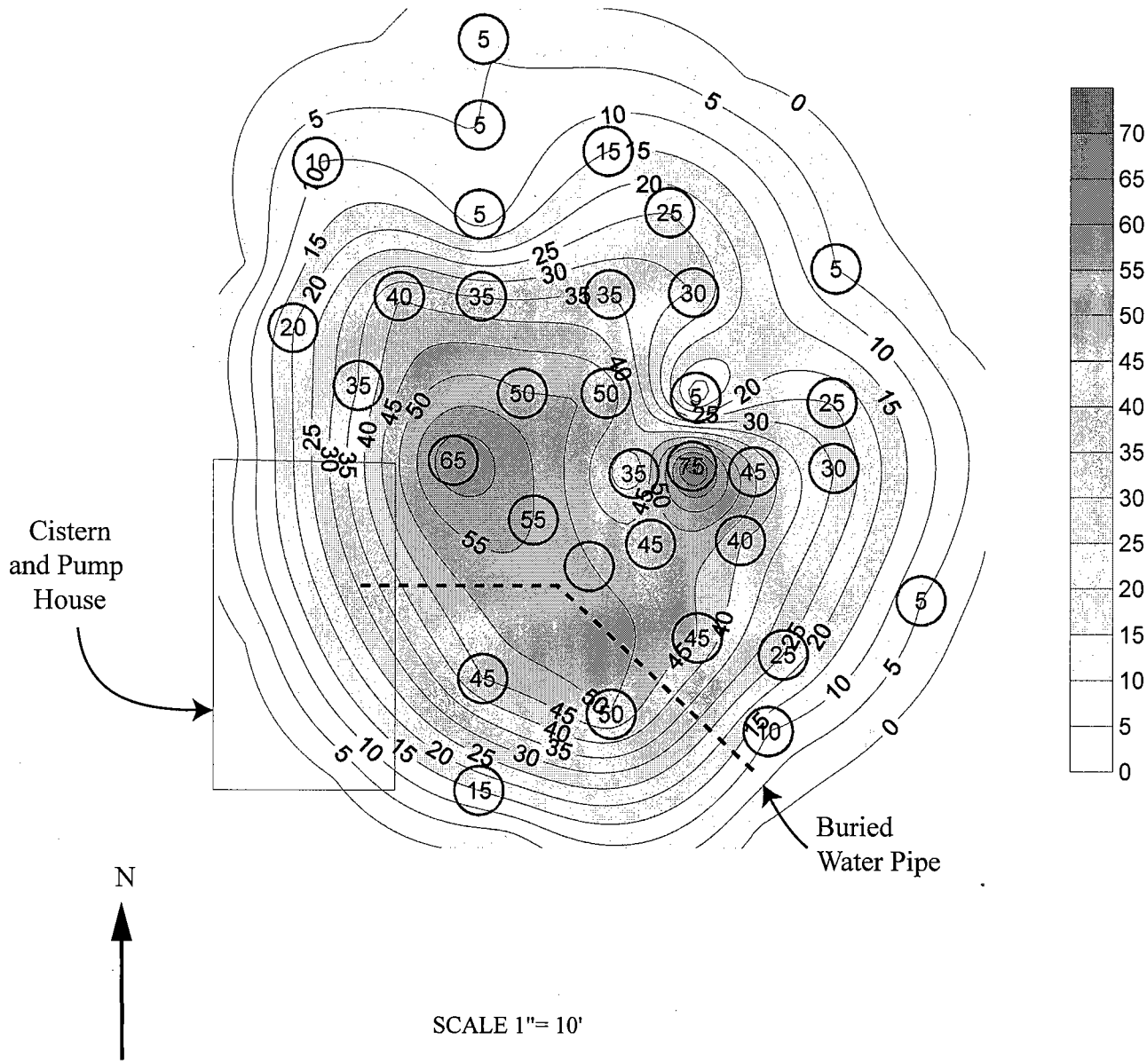
MAY 2005 PROJECT 2000102A	Figure 13 **WIREFRAME MAP,** **TOP AND BASE OF PID 500 ZONE**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.



LEGEND		
30 BOREHOLE LOCATION BOREHOLE NUMBER	A BOREHOLE ABANDONED DUE TO COLLAPSE	SOIL SAMPLE LOCATIONS

MAY 2005 PROJECT 2000102A	FIGURE 14 **SOIL SAMPLE LOCATIONS**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S. 35, T.24S, R.25E	2103 20th STREET BAKERSFIELD, CA.

2000_05_102_hole location map

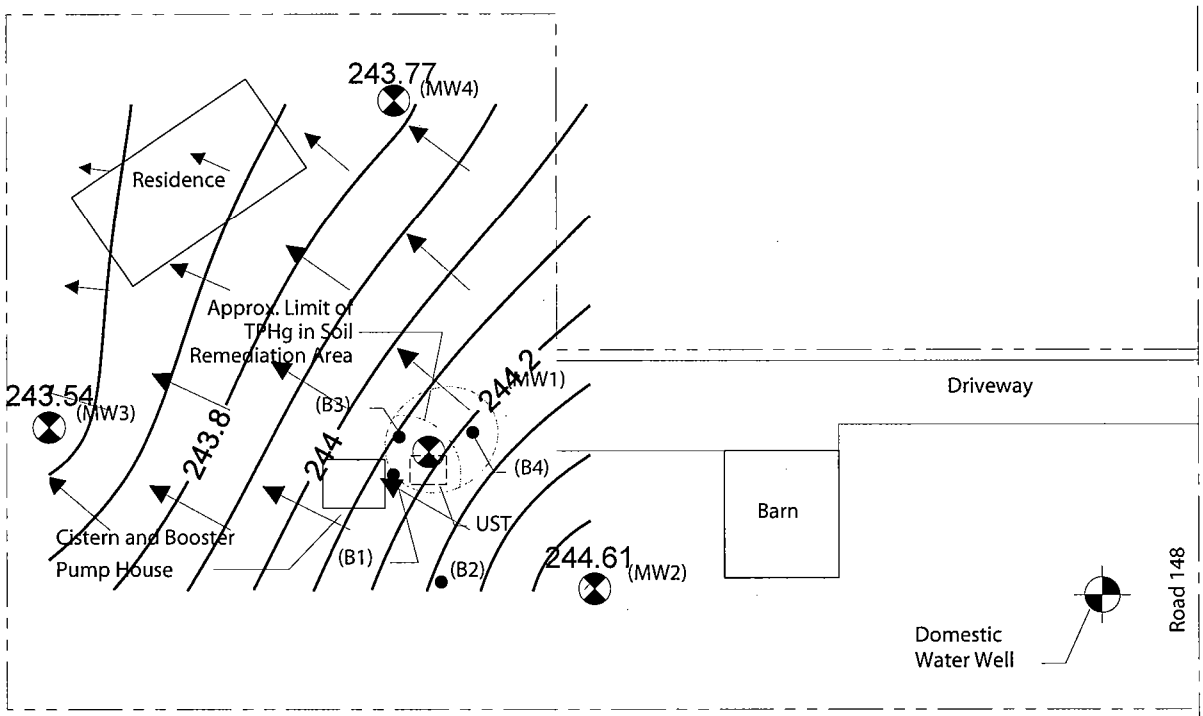


LEGEND

Borehole Location

0 Thickness of PID 100 - 2000 Interval

MAY 2005 PROJECT 2000102A	FIGURE 15 **ISOPACH - PID READING 100 - 2000**	RAM ENVIRONMENTAL ENGINEERING SERVICES INC.
MARDIKIAN REMEDIATION	661 Road 148, Delano, California S.35 T.24S, R.25E.	2103 20th STREET BAKERSFIELD, CA.



Legend:

(B4) Soil Boring

(MW4) 249.03' Monitoring well and shallow groundwater surface elevation on April 18, 2005 well casings surveyed relative to site datum with assumed elevation of 320 ft. MSL

Groundwater Flow Vector

Approximate shallow groundwater elevation contour; CI 0.2 ft.

Domestic Water Supply Well

Approximate Limit of UST Excavation

Property Line

Center Line of Road

N

0 80

Approximate Scale (feet)

RAM ENVIRONMENTAL ENGINEERING SERVICES, INC.

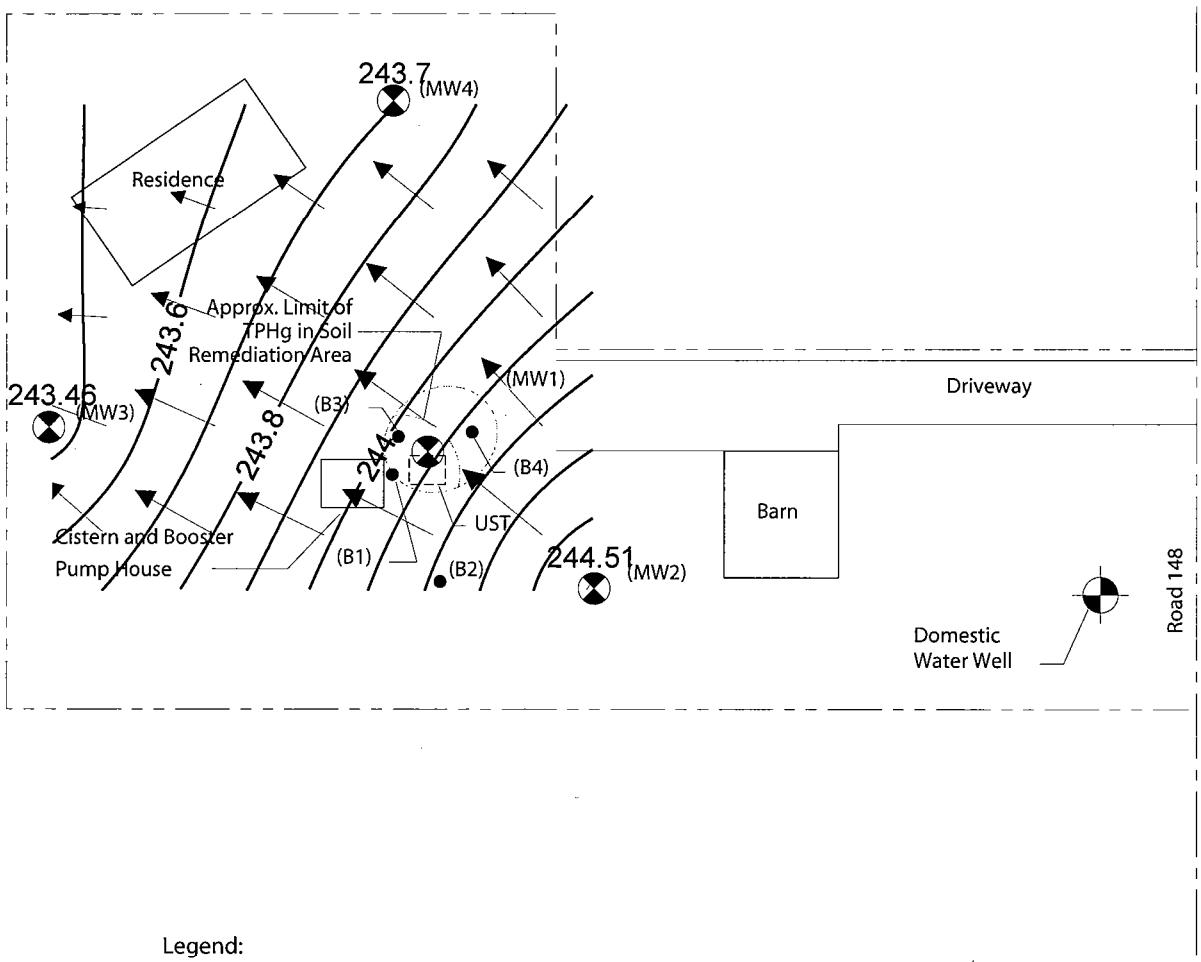
Project No.:200102A Date: May 2005

Figure 16

Groundwater Elevation Map - April 18, 2005

Greg Mardikian
661 Road 148
Delano, CA

2005_102A_Mardikian monitoring wells



Legend:

(B4) Soil Boring

(MW4) 249.03' Monitoring well and shallow groundwater surface elevation on May 4, 2005 well casings surveyed relative to site datum with assumed elevation of 320 ft. MSL

Groundwater Flow Vector

Approximate shallow groundwater elevation contour; CI 0.2 ft.

Domestic Water Supply Well

Approximate Limit of UST Excavation

Property Line

Center Line of Road

N

0 80

Approximate Scale (feet)

RAM ENVIRONMENTAL ENGINEERING SERVICES, INC.

Project No.:200102A Date: May 2005

Figure 17

Groundwater Elevation Map

Greg Mardikian
661 Road 148
Delano, CA

2005_102A_Mardikian monitoring wells

RBCA SITE ASSESSMENT

Input Parameter Summary

Site Name: Mardikian
Site Location: Delano

Completed By: J. McNaboe
Date Completed: 6-May-05

Job ID: 2000102A

Exposure Parameters		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Construc.
AT_c	Averaging time for carcinogens (yr)	70				
AT_n	Averaging time for non-carcinogens (yr)	30			25	1
BW	Body weight (kg)	70	15	35	70	
ED	Exposure duration (yr)	30	6	16	25	1
τ	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure frequency (days/yr)	350			250	180
EF_D	Exposure frequency for dermal exposure	350			250	
IR_w	Ingestion rate of water (L/day)	2			1	
IR_s	Ingestion rate of soil (mg/day)	100	200		50	100
SA	Skin surface area (dermal) (cm^2)	5800		2023	5800	5800
M	Soil to skin adherence factor	1				
ET_{swim}	Swimming exposure time (hr/event)	3				
EV_{swim}	Swimming event frequency (events/yr)	12	12	12		
IR_{swim}	Water ingestion while swimming (L/hr)	0.05	0.5			
SA_{swim}	Skin surface area for swimming (cm^2)	23000		8100		
IR_{fish}	Ingestion rate of fish (kg/yr)	0.025				
FI_{fish}	Contaminated fish fraction (unitless)	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	Residential	None
Soil Leaching to Groundwater Ingestion	None	Residential	None
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	None		
Outdoor Air:			
Particulates from Surface Soils	None	None	None
Volatilization from Soils	None	Residential	None
Volatilization from Groundwater	None	None	None
Indoor Air:			
Volatilization from Subsurface Soils	None	NA	NA
Volatilization from Groundwater	None	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	400	NA	(ft)
Soil leaching to groundwater receptor	NA	60	NA	(ft)
Outdoor air inhalation receptor	NA	400	NA	(ft)

Target Health Risk Values		Individual	Cumulative
TR_{nc}	Target Risk (class A&B carcinogens)	1.0E-6	1.0E-5
TR_c	Target Risk (class C carcinogens)	1.0E-5	
THQ	Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	1.0E+0

Modeling Options	
RBCA tier	Tier 2
Outdoor air volatilization model	Surface & subsurface models
Indoor air volatilization model	NA
Soil leaching model	ASTM leaching model
Use soil attenuation model (SAM) for leachate?	Yes
Air dilution factor	User-specified ADF
Groundwater dilution-attenuation factor	Domenico model w/ biodeg.

NOTE: NA = Not applicable

Surface Parameters		General	Construction	(Units)
A	Source zone area	2.2E+4	NA	(ft^2)
W	Length of source-zone area parallel to wind	1.5E+2	NA	(ft)
W_{gw}	Length of source-zone area parallel to GW flow	1.5E+2		(ft)
U_{air}	Ambient air velocity in mixing zone	2.3E+8		(ft/yr)
δ_{air}	Air mixing zone height	6.6E+0		(ft)
P_e	Areal particulate emission rate	NA		(g/cm^2/s)
L_{ss}	Thickness of affected surface soils	3.3E+0		(ft)

Surface Soil Column Parameters		Value			(Units)
h_{cap}	Capillary zone thickness	NA			(ft)
h_v	Vadose zone thickness	NA			(ft)
ρ_s	Soil bulk density	1.7E+0			(g/cm^3)
f_{oc}	Fraction organic carbon	1.0E-2			(-)
θ_T	Soil total porosity	3.8E-1			(-)
K_{vz}	Vertical hydraulic conductivity	1.0E+4			(ft/yr)
k_v	Vapor permeability	1.1E-11			(ft^2)
L_{gw}	Depth to groundwater	9.8E+0			(ft)
L_s	Depth to top of affected soils	0.0E+0			(ft)
L_{base}	Depth to base of affected soils	9.8E+0			(ft)
L_{subs}	Thickness of affected soils	9.8E+0			(ft)
pH	Soil/groundwater pH	6.8E+0			(-)
		capillary	vadose	foundation	
θ_w	Volumetric water content	0.342	0.12	0.12	(-)
θ_a	Volumetric air content	0.038	0.26	0.26	(-)

Building Parameters		Residential	Commercial	(Units)
L_b	Building volume/area ratio	NA	NA	(ft)
A_b	Foundation area	NA	NA	(ft^2)
X_{crk}	Foundation perimeter	NA	NA	(ft)
ER	Building air exchange rate	NA	NA	(1/yr)
L_{crk}	Foundation thickness	NA	NA	(ft)
Z_{crk}	Depth to bottom of foundation slab	NA	NA	(ft)
η	Foundation crack fraction	NA	NA	(-)
dP	Indoor/outdoor differential pressure	NA	NA	(psi)
Q_s	Convective air flow through slab	NA	NA	(ft^3/yr)

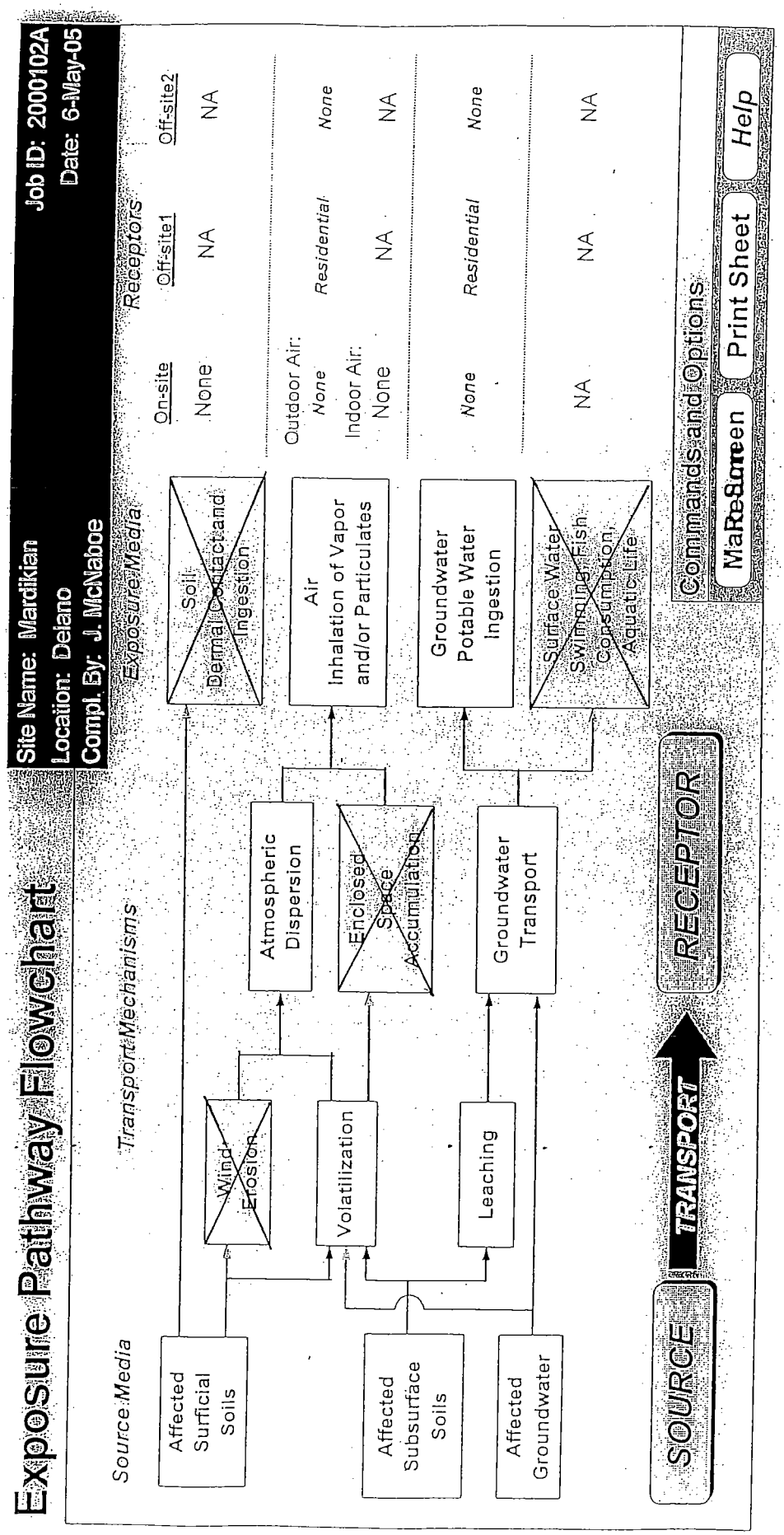
Groundwater Parameters		Value	(Units)
δ_{gw}	Groundwater mixing zone depth	6.6E+0	(ft)
I_f	Net groundwater infiltration rate	1.2E+1	(in/yr)
U_{gw}	Groundwater Darcy velocity	8.2E+1	(ft/yr)
V_{gw}	Groundwater seepage velocity	2.2E+2	(ft/yr)
K_s	Saturated hydraulic conductivity	8.2E+3	(ft/yr)
i	Groundwater gradient	1.0E-2	(-)
S_w	Width of groundwater source zone	1.5E+2	(ft)
S_d	Depth of groundwater source zone	6.6E+0	(ft)
θ_{eff}	Effective porosity in water-bearing unit	3.8E-1	(-)
f_{oc-aet}	Fraction organic carbon in water-bearing unit	1.0E-3	(-)
pH_{aet}	Groundwater pH	6.2E+0	(-)
	Biodegradation considered?	1st Order	

Transport Parameters		Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport		Groundwater Ingestion		Soil Leaching to GW		
α_x	Longitudinal dispersivity	4.0E+1	NA	6.0E+0	NA	(ft)
α_y	Transverse dispersivity	1.3E+1	NA	2.0E+0	NA	(ft)
α_z	Vertical dispersivity	2.0E+0	NA	3.0E-1	NA	(ft)
Lateral Outdoor Air Transport		Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
σ_y	Transverse dispersion coefficient	NA	NA	NA	NA	(ft)
σ_z	Vertical dispersion coefficient	NA	NA	NA	NA	(ft)
ADF	Air dispersion factor	1.0E+0	NA	NA	NA	(-)

Surface Water Parameters		Off-site 2	(Units)
Q_{sw}	Surface water flowrate	NA	(ft^3/yr)
W_{pl}	Width of GW plume at SW discharge	NA	(ft)
δ_{pl}	Thickness of GW plume at SW discharge	NA	(ft)
DF_{sw}	Groundwater-to-surface water dilution factor	NA	(-)

FIGURE 18 - RBCA Input Parameter Summary

FIGURE 19 - RBCA Exposure Pathway Flowchart



RBCA SITE ASSESSMENT | **Baseline Risk Summary-All Pathways**

Site Name: Mardikian
Site Location: Delano

Completed By: J. McNaboe
Date Completed: 6-May-05

TIER 2 BASELINE RISK SUMMARY TABLE

EXPOSURE PATHWAY	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	1.2E-8	1.0E-6	1.2E-8	1.0E-5	☐	5.8E-4	1.0E+0	6.0E-4	1.0E+0	☐
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	NA	NA	NA	NA	☐	NA	NA	NA	NA	☐
SOIL EXPOSURE PATHWAYS										
Complete:	NA	NA	NA	NA	☐	NA	NA	NA	NA	☐
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	2.6E-7	1.0E-6	2.6E-7	1.0E-5	☐	7.0E-3	1.0E+0	1.4E-2	1.0E+0	☐
SURFACE WATER EXPOSURE PATHWAYS										
Complete:	NA	NA	NA	NA	☐	NA	NA	NA	NA	☐
CRITICAL EXPOSURE PATHWAY (Maximum Values From Complete Pathways)										
	2.6E-7	*1.0E-6*	*2.6E-7*	*1.0E-5*	☐	*7.0E-3*	*1.0E+0*	*1.4E-2*	*1.0E+0*	☐
	Groundwater		*Groundwater*			*Groundwater*		*Groundwater*		

FIGURE 20 – Baseline Risk Summary-All Pathways

RBCA SITE ASSESSMENT

TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Mardikian
Site Location: Delano

Completed By: J. McNaboe
Date Completed: 6-May-05

Job ID: 2000102A

Constiuent: Benzene
Source Medium: Affected Soils Leaching to Groundwater
Biodegredation: 1st Order

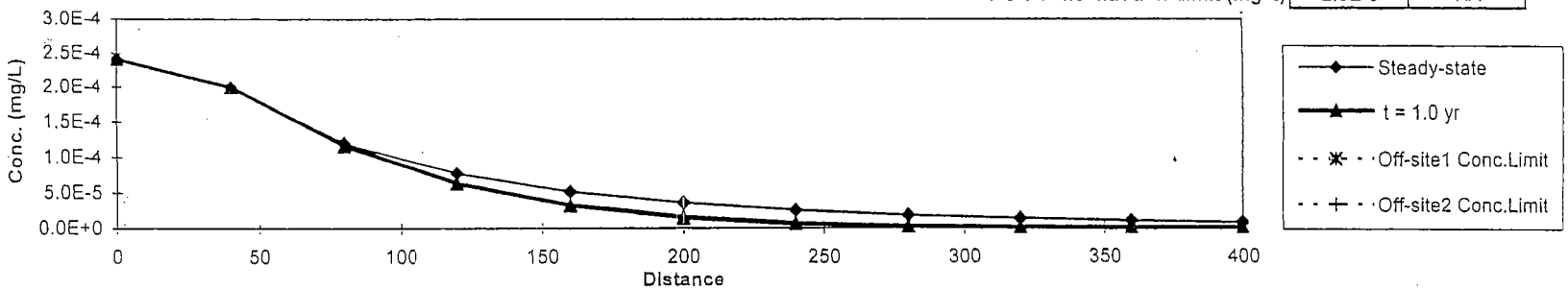
Concentration vs. Distance from Source (for given time)

Time (yr) 1.0

Distance (ft)		0	40	80	120	160	200	240	280	320	360	400
t = 1.0 yr	Conc. (mg/L)	2.4E-4	2.0E-4	1.2E-4	6.4E-5	3.2E-5	1.5E-5	7.0E-6	3.2E-6	1.5E-6	6.8E-7	3.2E-7
Steady-state		2.4E-4	2.0E-4	1.2E-4	7.7E-5	5.2E-5	3.5E-5	2.5E-5	1.8E-5	1.3E-5	1.0E-5	7.7E-6

Off-site1	Off-site2
Residential	None
400	NA
3.2E-7	NA
7.7E-6	NA
2.9E-3	NA

POE Concentration Limit (mg/L)



Concentration vs. Time (for given distance from source)

Distance (ft) 198

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 198 ft	Conc. (mg/L)	0.0E+0	3.6E-5	3.6E-5	3.6E-5	3.6E-5	3.6E-5	3.6E-5	3.6E-5	3.6E-5	3.6E-5	3.6E-5
Off-site1 (400 ft)		0.0E+0	6.4E-6	7.7E-6	7.7E-6	7.7E-6	7.7E-6	7.7E-6	7.7E-6	7.7E-6	7.7E-6	7.7E-6
Off-site2 (0 ft)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA

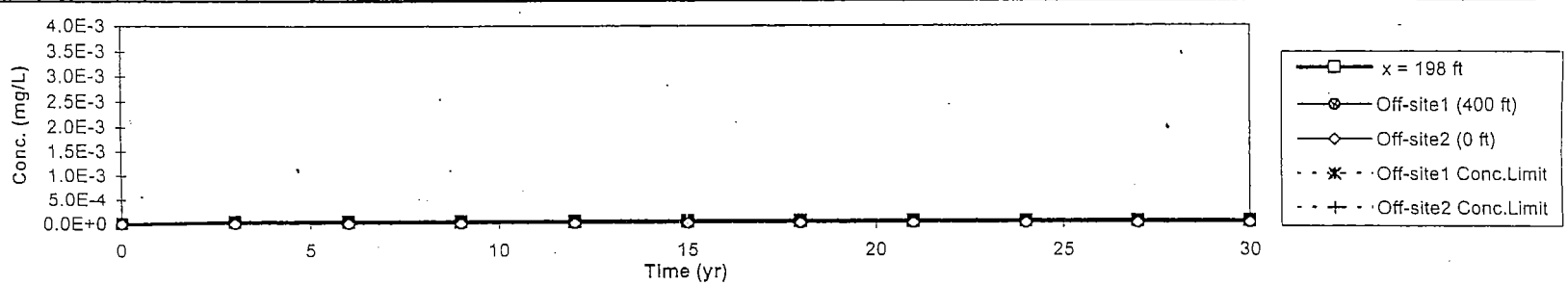


FIGURE 21 – Tier 2 Transient Domenico Analysis of Benzene in Soil

RBCA SITE ASSESSMENT | **TIER 2 TRANSIENT DOMENICO ANALYSIS**

Site Name: Mardikian
Site Location: Delano

Completed By: J. McNaboe
Date Completed: 6-May-05

Job ID: 2000102A

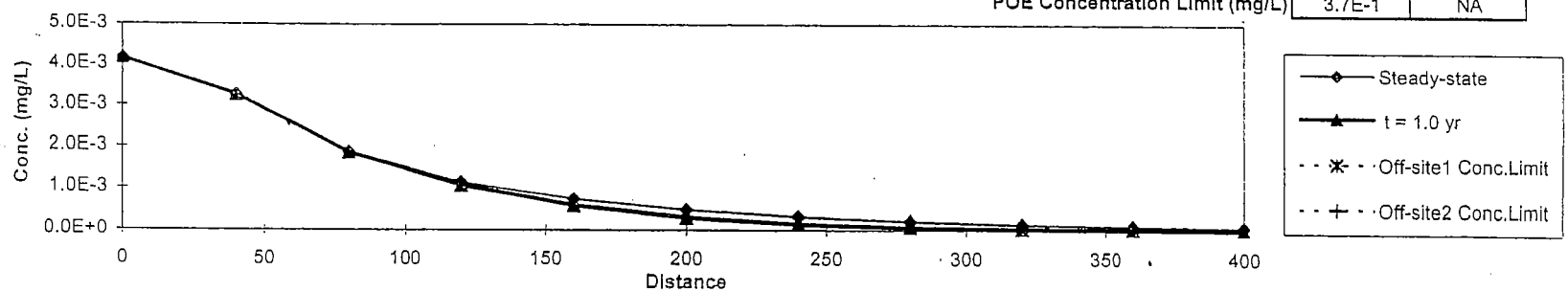
Constituent: Methyl t-Butyl ether
Source Medium: Affected Soils Leaching to Groundwater
Biodegredation: 1st Order

Concentration vs. Distance from Source (for given time)

Time (yr) 1.0

Distance (ft)		0	40	80	120	160	200	240	280	320	360	400
t = 1.0 yr	Conc. (mg/L)	4.2E-3	3.3E-3	1.9E-3	1.1E-3	5.8E-4	3.0E-4	1.6E-4	7.9E-5	4.1E-5	2.1E-5	1.1E-5
Steady-state		4.2E-3	3.3E-3	1.9E-3	1.1E-3	7.3E-4	4.8E-4	3.2E-4	2.2E-4	1.6E-4	1.1E-4	8.4E-5

	Off-site1	Off-site2
	Residential	None
	400	NA
	1.1E-5	NA
	8.4E-5	NA
POE Concentration Limit (mg/L)	3.7E-1	NA



Concentration vs. Time (for given distance from source)

Distance (ft) 198

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 198 ft	Conc. (mg/L)	0.0E+0	4.9E-4	4.9E-4	4.9E-4	4.9E-4	4.9E-4	4.9E-4	4.9E-4	4.9E-4	4.9E-4	4.9E-4
Off-site1 (400 ft)		0.0E+0	8.0E-5	8.4E-5	8.4E-5	8.4E-5	8.4E-5	8.4E-5	8.4E-5	8.4E-5	8.4E-5	8.4E-5
Off-site2 (0 ft)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA

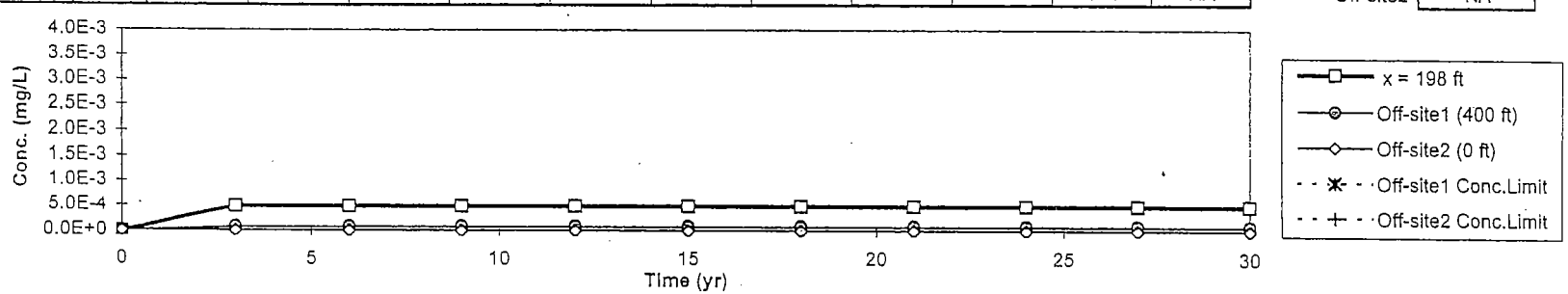


FIGURE 22 – Tier 2 Transient Domenico Analysis of MTBE in Soil

RBCA SITE ASSESSMENT

TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Mardikian
Site Location: Delano

Completed By: J. McNaboe
Date Completed: 6-May-05

Job ID: 2000102A

Constiuent: Methyl t-Butyl ether
Source Medium: Affected Groundwater
Biodegredation: 1st Order

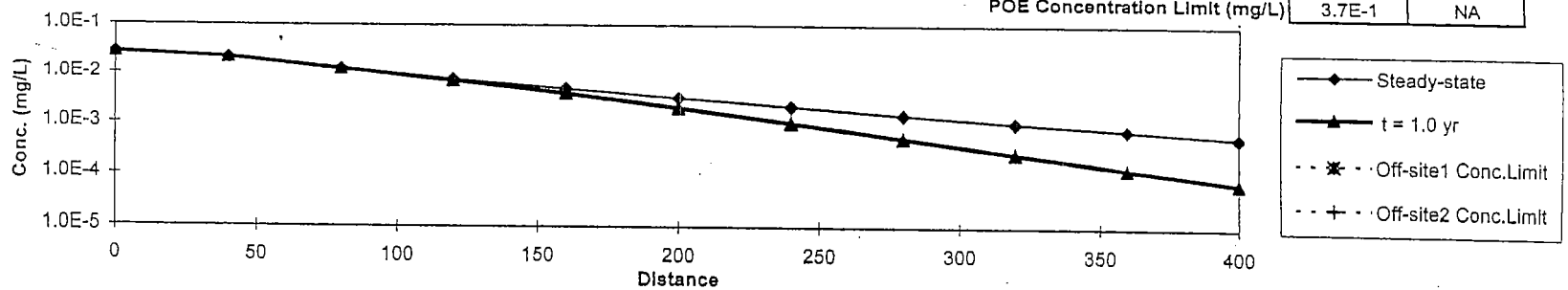
Concentration vs. Distance from Source (for given time)

Time (yr) 1.0

Distance (ft)		0	40	80	120	160	200	240	280	320	360	400
t = 1.0 yr	Conc. (mg/L)	2.8E-2	2.2E-2	1.2E-2	7.0E-3	3.8E-3	2.0E-3	1.0E-3	5.3E-4	2.7E-4	1.4E-4	7.2E-5
Steady-state		2.8E-2	2.2E-2	1.2E-2	7.6E-3	4.8E-3	3.2E-3	2.1E-3	1.5E-3	1.0E-3	7.6E-4	5.6E-4

POE Concentration Limit (mg/L)

Off-site1	Off-site2
Residential	None
400	NA
7.2E-5	NA
5.6E-4	NA
3.7E-1	NA



Concentration vs. Time (for given distance from source)

Distance (ft) 200

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 200 ft	Conc. (mg/L)	0.0E+0	3.2E-3	3.2E-3	3.2E-3	3.2E-3	3.2E-3	3.2E-3	3.2E-3	3.2E-3	3.2E-3	3.2E-3
Off-site1 (400 ft)		0.0E+0	5.3E-4	5.6E-4	5.6E-4	5.6E-4	5.6E-4	5.6E-4	5.6E-4	5.6E-4	5.6E-4	5.6E-4
Off-site2 (0 ft)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Time to Reach Conc. Limit (yr)

Off-site1	NA
Off-site2	NA

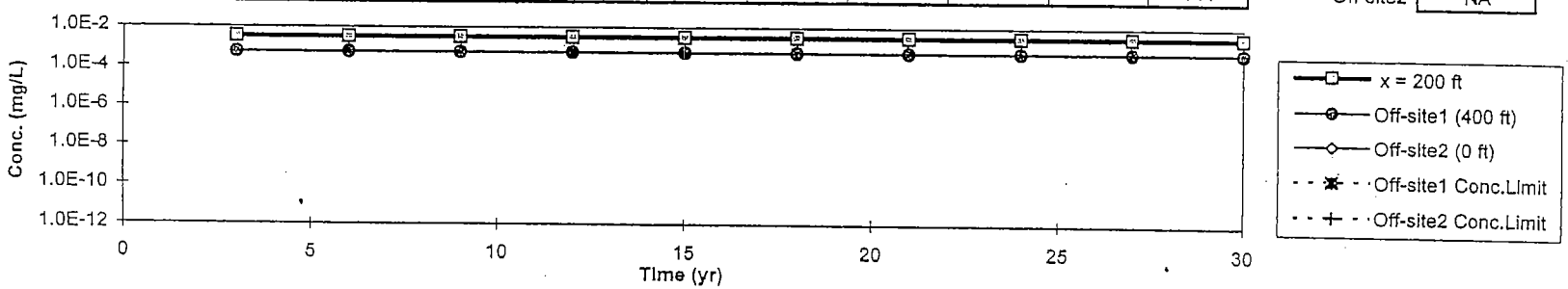


FIGURE 23 – Tier 2 Transient Domenico Analysis of MTBE in Affected Groundwater

TABLES

MARDIKIAN REMEDIATION
DELANO, CALIFORNIA
BOREHOLE DATA AND CALCULATIONS
TABLE 4-2

Hole Number	DEPTH	1	2	3	4	5	6	7	8	9	10	11	12
Location		F-6	E-5	G-6	H-7	H-8	H-9	H-11 B	G-10	G-9	G-8/9	G-8	F-12
	5			169	3.8	3.3	8.6	0	0	1	260	300	1.7
	10		10		4.0	2.7	0	0	0	0	80	30	0
	15		10	100	780	0	0	0	0	0	1500	100	0
	20	7	300	2000	802	2000	500	0.5	0	200	1600	2000	1100
	25	1000	300	2000	1567	2000	1700	0.2	76	2000	2000	2000	1400
	30	2000	350	2000	2000	2000	800	0	101	2000	2000	2000	1000
	35	2000	300	360	2000	2000	905	4.2	352	2000	2000	2000	2000
	40	2000	2000	2000	1582	2000	2000	101	2000	2000	2000		2000
	45	2000	2000	2000	2000	2000	1740	95	405	2000			
	50	2000	250	719	2000	2000	343		160	2000			1750
	55	1000	250	2000	1308	2000	348		150	2000	2000		400
	60	30	10	2000	408	115	49			200	1500		400
	65	25	10	181	109	84				60	70		400
	70	20									100		75
	75										125		
Cubic yards of soil removed/ borehole		18.32	17.01	51.03	17.01	17.01	15.70	11.78	14.39	17.01	19.63	9.16	18.32
Cubic yards of soil removed with a PID reading > 500		9.16	2.62	11.78	11.78	10.47	7.85	0.00	1.31	9.16	13.08	5.23	9.16
Depth to PID 500 (feet)		25	40	20	15	20	20	0	40	25	15	20	20
Thickness of PID 500 - 2000+ (feet)		35	10	45	45	40	30	0	5	35	50	20+	35
Depth to PID 100 (ft)		25	20	5	15	20	20	40	30	20	5	5	20
Thickness of PID 100 - 2000+ (feet)		35	40	65	55	45	40	5	30	45	75	35	50
Cubic yards of soil removed, PID 100-2000+		9.16	10.47	17.01	14.39	11.78	10.47	1.31	7.85	11.78	19.63	9.16	13.08
Thickness of 2000+ PID		25	10	35	25	40	5	0	5	35	35	20	15
Cubic yards of soil removed, PID 2000+		6.54	2.62	9.16	6.54	10.47	1.31	0.00	1.31	9.16	9.16	5.23	3.93

Calculations: Volume of a cyliner = V=(3.14)(r^2)(h)
r = radius = 1.5 ft
h = boring depth in feet

Volume of soil removed in borings (cubic yards) =(3.14)(1.5 ft^2)(h ft)/ 1 cubic yard/ 27ft^3

MARDIKIAN REMEDIATION
DELANO, CALIFORNIA
BOREHOLE DATA AND CALCULATIONS

Hole Number	DEPTH	13	14	15	16	17	18	19	20	21	22
Location		F-7/8	F-8/9	F-10	E-10	E-20	E-15	E-5	C-6	B-6	C-7
	5	0.7	1.7	0.3	1	0	0	0	0	0	0
	10	0	8.5	0	0	0	0	0	0	0	0
	15	0	5.5	0	0	0	0	0	0	0	0
	20	1580	200	0	0	0	294	84.8	0	0	0
	25	2000 +		0	0	0	144	557	0	0	0
	30	2000+		9	8	2.5	49.6	179	0	0	2
	35	1200		115	9	222	2000	1770	22.9	3.5	24.5
	40	2000 +		1100	10	1227	2000	2000	64.1	25.6	33.5
	45	2000 +			550	1628	2000	2000	412	707	119.2
	50	450		1450	58	2000	2000	1910	73.7	49	1701
	55	1400		150	24	92.2	29.7	269	26.6	88.1	170
	60			90.1		183	39.5	62.9	45.7	42.2	18.8
	65	185		85		40			16.9	4.9	
	70	80		53							
	75	65									
Cubic yards of soil removed/ borehole		19.63	5.23	18.32	14.39	17.01	15.70	15.70	17.01	17.01	15.70
Cubic yards of soil removed with a PID reading > 500		11.78	0.00	3.93	1.31	3.93	5.23	5.23	0.00	1.31	1.31
Depth to PID 500 (feet)		20		40	45	40	35	25		45	50
Thickness of PID 500 - 2000+ (feet)		45		15	5	15	20	30	0	5	5
Depth to PID 100 (ft)		20	20	35	45	35	20	25	45	45	45
Thickness of PID 100 - 2000+ (feet)		50	5	25	5	30	35	35	5	5	15
Cubic yards of soil removed, PID 100-2000+		13.08	1.31	6.54	1.31	7.85	9.16	9.16	1.31	1.31	3.93
Thickness of 2000+ PID		20	0	0	0	5	20	10	0	0	0
Cubic yards of soil removed, PID 2000+		5.23	0.00	0.00	0.00	1.31	5.23	2.62	0.00	0.00	0.00

MARDIKIAN REMEDIATION
DELANO, CALIFORNIA
BOREHOLE DATA AND CALCULATIONS

Hole Number	DEPTH	23	24	25	26	27	28	29	30	31	32	33
Location		D-6	K-6	I-6	I-8	J-7	I-9	E-4	J-9	H-7	D-8	C-4
	5	41.9	0	0	0.5	0	0	0	0	0	0	0
	10	1	0	0	0	0	0	0	0	5.8	0	0
	15	0	0	800	0	0	0	0	0		1.1	0
	20	22.3	0	1700	500	381	0	0	0		0	0
	25	42.5	0	2000	1600	800	0	0	0		0	0
	30	164	2.5	1000	2000	1685	28.5	12.4	0		4.9	0
	35		64.6	2000	1400	1677	177	92.8	35.5		932	22.6
	40		188	1180	2000	2000	360	167	73.7		126	42.7
	45		929	2000	2000	2000	1799	1802	876		1730	
	50		240	450	220	1994	384	1677	134		1227	802
	55		40	145	185	441	323	168	75.3		237	230
	60		55	45	107	215	40.5	32	18.6		31.5	72.6
	65			55	29.1	123					24.3	41.6
	70											
	75											
Cubic yards of soil removed/ borehole		7.85	15.70	17.01	17.01	17.01	15.70	15.70	15.70	2.62	17.01	17.01
Cubic yards of soil removed with a PID reading > 500		0.00	1.31	9.16	7.85	7.85	1.31	2.62	1.31	0.00	5.23	2.62
Depth to PID 500 (feet)			45	15	20	25	45	45	45		45	45
Thickness of PID 500 - 2000+ (feet)			5	35	30	30	5	10	5		10	10
Depth to PID 100 (ft)		30	40	15	20	20	35	40	45		35	50
Thickness of PID 100 - 2000+ (feet)		5	15	45	45	50	25	20	10		25	10
Cubic yards of soil removed, PID 100-2000+		1.31	3.93	11.78	11.78	13.08	6.54	5.23	2.62	0.00	6.54	2.62
Thickness of 2000+ PID		0	0	15	15	15	0	0	0	0	0	0
Cubic yards of soil removed, PID 2000+		0.00	0.00	3.93	3.93	3.93	0.00	0.00	0.00	0.00	0.00	0.00

540.34	Total number of Cubic Yards of soil removed from plume site.
108.59	Cubic Yards of soil removed with a PID reading of 500 - 2000+ ppm.
256.43	Cubic yards of soil removed with a PID reading of 100 - 2000+
91.58	Cubic yards of soil removed with a PID reading of 2000+

Percentage of soil removed with a PID reading of 500 - 2000+ =	20.10
Percentage of soil removed with a PID reading of 100 - 2000+ =	47.46
Precentage of soil removed with a PID reading of 2000+ =	16.95

APPENDIX A

PREVIOUS WORK

Table 1
SUMMARY OF LABORATORY RESULTS

Constituents	MW1							Dispenser	Ground
	10'	25'	40'	55'	60'	65'	70'	B1	Water
TPH-g	< 1	1500	2800	< 1	< 1	< 1	< 1	< 1	
Benzene	< 0.005	0.43	0.3	0.013	0.028	< 0.005	< 0.005	< 0.005	1000
Ethylbenzene	< 0.005	18	0.71	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	970
Toluene	< 0.005	37	4.2	0.018	0.016	< 0.005	< 0.005	< 0.005	7500
Total Xylenes	< 0.01	110	4.8	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	5600
TBA (t-butyl alcohol)	< 0.2	< 0.2	2.2	0.49	5.1	< 0.2	< 0.2	< 0.2	< 50
DIPE (di-isopropyl ether)	< 0.005	< 0.005	< 0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 1
ETBE (ethyl-t-butyl ether)	< 0.005	< 0.005	< 0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 1
MTBE (methyl tert-butyl ether)	< 0.005	< 0.005	0.15	0.41	0.44	< 0.005	< 0.005	< 0.005	160
TAME (t-amyl methyl ether)	< 0.005	< 0.005	< 0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 1
1,2-DCA (1,2-dichloroethane)	< 0.005	< 0.005	< 0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.5
EDB (ethylene dibromide)	< 0.005	< 0.005	< 0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.5
Total Lead	2.9	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	5.6

Notes:
1. Units are in mg/kg except the groundwater sample which is in ug/L.

TABLE 1. Summary of Soil Analytical Results

SAMPLE NO.	B2-20	B2-35	B2-50	B2-65	B3-20	B3-35	B3-50	B3-65	B4-20
DATE	4/25/2002	4/25/2002	4/25/2002	4/25/2002	4/25/2002	4/25/2001	4/25/2001	4/25/2001	4/25/2002
CONSTITUENTS									
Benzene	ND	ND	ND	ND	0.71	16	11	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Benzene	ND	ND	ND	ND	170	170	70	ND	ND
Toluene	ND	ND	ND	ND	200	460	190	ND	ND
Total Xylenes	ND	ND	ND	ND	1000	980	360	ND	ND
t-Amyl methyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND
t-Butyl alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diisopropyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl-t-butyl	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl-t-butyl ether	ND	ND	0.0099	ND	ND	ND	1.1	0.054	ND
Gasoline Range Organics	ND	ND	ND	ND	5100	4300	590	ND	ND

Units are im milligrams per kilogram (mg/kg).

TABLE 1. Summary of Soil Analytical Results

SAMPLE NO.	B4-35	B4-50	B4-65	MW2-70	MW2-75	MW3-65	MW3-70	MW4-60	MW4-65
DATE	4/25/2002	4/25/2002	4/25/2002	4/26/2002	4/26/2002	4/26/2002	4/26/2002	4/26/2002	4/26/2002
CONSTITUENTS									
Benzene	ND	0.44	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Benzene	ND	0.15	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	0.23	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	ND	0.94	ND	ND	ND	ND	ND	ND	ND
t-Amyl methyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND
t-Butyl alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diisopropyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl-t-butyl	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl-t-butyl ether	0.037	0.75	0.042	ND	ND	ND	ND	ND	ND
Gasoline Range Organics	ND	ND	ND	ND	ND	ND	ND	ND	ND

Units are im milligrams per kilogram (mg/kg).

APPENDIX B

SOIL REMOVAL DATA SHEETS

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
1	5				SW: SAND, 0/90/10, brown, loose, no odor, no stain.
	15	8:00			SW: SAND, 0/90/10, brown, loose, slight odor, no stain.
	20	8:00	4-9		SW: SAND, 0/90/10, well graded, loose slight odor
	25	8:00	1000		SW: SAND, 0/90/10, well graded, loose slight odor
	30	8:00	2000		SW: SAND, 0/90/10, well graded, loose slight odor
	35	8:00	2000		SW: SAND, 0/90/10, well graded, loose slight odor
	40	8:00	2000		SM: SILTY SAND, 0/70/30, brown, well graded, slightly cohesive, strong odor.
	50	8:00	2000		SM: SILTY SAND 0/70/30, brown, well graded, slightly cohesive, strong odor.
	55	8:00	2000		ML/SP: SILTY SAND, 0/80/20, brown, fine grained, poorly graded, loose, minor odor, no stain
	60	8:00	1000		ML/SP: SILTY SAND, 0/80/20, brown, fine grained, poorly graded, loose, minor odor, no stain
	65	9:00	30		ML/SP: SILTY SAND, 0/80/20, brown, fine grained, poorly graded, loose, minor odor, no stain
	70	9:30	20-30		ML: CLAYEY SILT, 0/10/90, grey, low plasticity, minor odor, possible grey staining
	73	10:15	20		SW: SAND, 0/95/5,red brown, loose, well graded, minor clay, no stain, minor odor

Hole Number:	1	Sampler:	Richard M. Casagrande
Hole Location:	F-6		
Date Drilled:	4/13/2005	Start Time:	7:30 A.M.
Date Backfilled:	4/13/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
2	5	10:00			SW: SAND, 0/90/10, brown, loose, no odor, no stain.
	10	10:03	10		ML: SILTY SAND, 0/90/10, brown, loose, slight odor, no stain.
	15	10:15	10		SW: SAND, 0/90/10, brown, loose, slight odor, no stain.
	20	10:20	300		SW: SAND, 0/90/10, well graded, loose slight odor
	25	10:30	300		SW: SAND, 0/90/10, well graded, loose slight odor
	30	10:40	350		SW: SAND, 0/90/10, well graded, loose slight odor
	35	11:00	300		SW: SAND, 0/90/10, brown, well graded, loose, moderate odor, no stain.
	40	11:10	2000		SM: SILTY SAND, 0/70/30, brown, well graded, slightly cohesive, strong odor.
	45	12:45	2000		SM: SILTY SAND 0/70/30, brown, well graded, slightly cohesive, strong odor.
	50	13:00	250		ML/SP: SILTY SAND, 0/80/20, brown, fine grained, poorly graded, loose, minor odor, no stain
	55	13:15	250		ML/SP: SILTY SAND, 0/80/20, brown, fine grained, poorly graded, loose, minor odor, no stain
	60	13:27	10		ML: CLAYEY SILT, 0/10/90, grey, low plasticity, minor odor, possible grey staining
	65	13:30	10	E-5-65	ML: CLAYEY SILT, 0/10/90, grey, low plasticity, minor odor, possible grey staining

Hole Number:	2	Sampler:	Richard Casagrande
Hole Location:	E-5		
Date Drilled:	4/13/2005	Start Time:	10:00
Date Backfilled:	4/13/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
3	5	8:15	169		COARSE SAND: brown, odor
	10				
	15	10:15	100		
	20	10:18	2000		
	25	10:21	2000		
	30	10:26	2000		VERY FINE SAND: cohesive
	35	8:38	360		COARSE SAND: odor,
	40	8:42	2000		FINE SAND: odor
	45	8:48	2000		VERY FINE SAND: silt
	50	8:52	719		VERY FINE SAND: silt, odor,
	55	9:00	2000		SILTY SAND: cohesive
	60	9:08	2000		SILTY SAND: cohesive, gray color
	65	9:12	181		SILTY SAND: gray, minor clay, damp

Hole Number:	3	Sampler:	T. Schweizer
Hole Location:	G-6		
Date Drilled:	4/14/2005	Start Time:	8:10 A.M. Stop Time: 9:15 A.M.
Date Backfilled:	4/14/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
4	5	10:08	3.8		FINE SAND: damp,
	10	10:12	4.0		FINE SAND: no odor
	15	10:15	780		FINE SAND: no odor
	20	10:18	802		FINE SAND: no odor
	25	10:21	1567		FINE SAND: no odor
	30	10:26	2000		FINE SANDY CLAY: odor
	35	10:32	2000		FINE SANDY CLAY: odor, cohesive
	40	10:38	1582		FINE SAND
	45	10:43	2000		FINE SILTY SAND: odor, cohesive
	50	10:48	2000		FINE SILTY SAND: damp, odor, gray
	55	10:54	1308		FINE SILTY CLAY: odor, damp, gray
	60	10:58	408		FINE SILTY CLAY: odor, damp, gray
	65	11:06	109		FINE SILTY SAND: 0/80/20

Hole Number:	4	Sampler:	T. Schweizer
Hole Location:	H-7		
Date Drilled:	4/14/2005	Start Time:	10:04 A.M. Stop Time: 11:06 A.M.
Date Backfilled:	4/14/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
5	5	8:00	3.3		SILT: 0/10/90 brown, loose, moist, no stain, no odor
	10	8:07	2-Jan		SILTY SAND: 0/70/30, light brown, loose, no odor, no stain,
	15	8:12	0		SW: 5/85/10, light brown, loose, no odor, no stain
	20	8:20	2000		SP SAND: 0/70/30, light olive, loose, fine grained, no stain, strong odor
	25	8:23	2000		SP SAND: 0/70/30, light olive, loose, fine grained, no stain, strong odor
	30	8:30	2000		SW SAND:10/90/0, light brown, loose, no stain, strong odor
	35	8:36	2000		SM SILTY SAND: 0/40/60, light brown, loose, no stain, strong odor
	40	8:40	2000		SM SILTY SAND: 0/40/60, light brown, loose, no stain, strong odor
	45	8:44	2000		SM SILTY SAND: 0/40/60, light brown, loose, no stain, strong odor
	50	8:55	2000		SM SILTY SAND: 0/40/60, light brown, loose, no stain, strong odor
	55	8:59	2000		ML CLAYEY FINE SAND: 5/30/65, light brown, loose, no stain, strong odor
	60	9:10	115		ML CLAYEY FINE SAND: 0/70/30, olive gray, no stain, minor odor
	65	9:14	84	H-8-65'/0915	ML CLAYEY FINE SAND: 0/30/70, olive gray, no stain, minor odor

Hole Number:	5	Sampler:	T. Schweizer
Hole Location:	H-8		
Date Drilled:	4/15/2005	Start Time:	8:00 A.M. Stop Time: 9:15 A.M.
Date Backfilled:	4/15/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 6	5	10:15	8.6		SM: SILTY SAND, 0/50/50, brown, loose, no stain, slight odor
	10	10:17	0		SW: SAND, 5/95/0, brown, well graded, loose, no stain, no odor
	15	10:22	0		ML: SILTY SAND, 0/50/50, olive brown, loose, moist, no stain, slight odor
	20	10:26	500		ML: SILTY SAND, 0/50/50, olive brown, loose, moist, no stain, slight odor
	25	10:28	1700		ML: SILTY SAND, 0/50/50, olive brown, loose, moist, no stain, moderate odor
	30	10:37	800		SW: SAND, 0/90/10, light brown, loose, moist, no stain, moderate odor.
	35	10:44	905		ML: SILTY SAND, 0/50/50, brown, consolidated, moderate odor, no stain
	40	10:55	2000		ML: SILTY SAND, 0/50/50, brown, loose, consolidated, moderate odor, no stain
	45	10:57	1740		ML: SILTY SAND, 0/50/50, brown, loose, low plasticity, no stain, strong odor
	50	11:03	343		SP: SAND, 0/80/20, light brown, fine grained, no stain, slight odor
	55	11:10	348		ML: GRAVELLY SILTY SAND, 10/40/50, brown, loose well graded, no stain, slight odor
	60	11:12	49		ML: SILTY SAND, 0/50/50, brown, loose, no stain, slight odor

Hole Number:	6	Sampler:	T. Schweizer
Hole Location:	H-9		
Date Drilled:	4/15/2005	Start Time:	9:59 Stop Time 11:15
Date Backfilled:	4/15/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 7	5	12:46	0		ML: SILTY SAND, 5/20/75, brown, loose, dry, no odor, no stain
	10	12:56	0		SW: SAND, 10/90/0 light brown, loose, well graded, minor angular gravel, no odor, no stain
	15	12:57	0		SP: SAND, 5/90/5, light brown, loose, poorly sorted,fine grained, no odor, no stain.
	20	1:00	0.5		ML: SILTY SAND, 0/40/60, Olive brown, loose, micaceous, no odor, no stain.
	25	1:05	0.2		ML: SILTY SAND, 0/40/60, Olive brown, loose, micaceous, no odor, no stain.
	30	1:07	0		ML: MINOR CLAY: 0/20/80, dark brown, slightly cohesive, no stain, no odor.
	35	1:11	4.2		SW: SAND, 0/100/0 light grey, well graded, loose, moist, no stain, slight odor.
	40	1:18	101		ML: SILTY SAND, 0/20/80, Olive brown, minor clay, loose, no stain, minor odor
	45	1:26	95	H-11B	ML: SILTY SAND, 5/20/80 olive brown, loose, minor gravel, no stains, slight odor

Hole Number: 7	Sampler: T. Schweizer
Hole Location: H-11-B	
Date Drilled: 4/15/2005	Start Time: 12:41 Stop Time: 13:30
Date Backfilled:	

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 8	5	13:55	0		SM: SILTY SAND, 0/50/50, dark brown, hard, no stain, no odor
	10	14:00	0		SW: SAND, 0/100/0, yellow-brown, well graded, loose, dry, no stain, no odor
	15	14:03	0		SM: SILTY SAND, 0/40/60, brown, minor clay, slightly cohesive, no stain, no odor
	20	14:06	0		ML: SILTY SAND, 0/40/60, brown, more cohesive than above, no stain, no odor
	25	14:15	76		SL: SILTY SAND, 0/30/70, brown, micaceous, loose, moist, no stain, no odor
	30	14:20	101		SW: SAND, 5/90/5, light brown, well graded, loose, moist, no stain, slight odor.
	35	14:24	352		ML: CLAYEY SILTY SAND, 0/30/70, brown, minor plasticity, no stain, slight odor
	40	14:30	2000		ML: SILTY SAND, 0/30/70, light brown, loose, minor clay, no stain, strong odor
	45	14:42	405		ML: SILTY SAND, 0/20/80, brown, loose, low plasticity, no stain, strong odor
	50	14:43	160		MC: CLAYEY SANDY SILT, 0/20/80, dark brown, minor plasticity, no stain, moderate odor
	55	14:50	150		ML: CLAYEY SANDY SILT, 0/20/80, dark brown, minor plasticity, no stain, moderate odor

Hole Number:	8	Sampler:	T. Schweizer
Hole Location:	G-10 35° 48.133N, 119° 14.358W		
Date Drilled:	4/15/2005	Start Time:	13:48 Stop Time 14:50
Date Backfilled:	4/15/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 9	5	15:17	1		SM: SILTY SAND, 0/20/80, dark brown, loose, no stain, no odor.
	10	15:19	0		SP: SAND, 0/100/0, light brown, fine grained, loose, no stain, no odor.
	15	15:22	0		SW: SAND, 0/100/0, brown, well graded, loose, dry, no stain, no odor.
	20	15:25	200		SM: SILTY SAND, 0/50/50, light brown, minor cohesion, dry, no stain, moderate odor.
	25	15:30	2000		SP: SAND, 0/100/0, light-brown, fine grade, loose, no stain, strong odor.
	30	15:36	2000		SW: SAND, 0/100/0, light brown-yellow, well graded, loose, dry, no stain, strong odor.
	35	15:44	2000		SM: SILTY SAND, 5/45/50, light brown, loose, minor angular gravel 1/8", no stain, strong odor.
	40	15:47	2000		ML: SILTY SAND, 0/10/90, light brown, very fine grained, loose, no stain, strong odor.
	45	15:50	2000		ML: SANDY SILT, 0/20/80, brown, minor sand Grains in silt, loose, no stain, no odor.
	50	15:55	2000		ML: CLAYEY SILT, 0/0/100, dark brown, minor clay, loose, dry, no stain, strong odor.
	55	16:00	2000		ML: CLAYEY SILT, 0/0/100, dark brown, minor clay, slight plasticity, dry, no stain, strong odor.
	60	16:04	200		ML: SANDY SILT, 0/10/90, brown, loose, no plasticity, moderate odor, no stain.
	65	16:06	60		ML: SANDY SILT, 0/10/90, brown, loose, no plasticity, moderate odor, no stain.

Hole Number:	9	Sampler:	J. McNaboe
Hole Location:	G-9		
Date Drilled:	4/15/2005	Start Time:	15:10 / Stop Time: 16:06
Date Backfilled:	4/15/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 10	5	8:33	260		SM: SILTY SAND, 0/20/80, light brown, loose, no stain, strong odor,
	10	8:39	80		SW: SAND, 5/90/5, light brown, well graded, no stain, moderate odor, loose
	15	8:40	1500		SM: SILTY SAND, 0/60/40, light brown, loose, no stain, strong odor,
	20	8:52	1600		SM: SILTY SAND, 0/60/40, light brown, loose, no stain, strong odor,
	25	9:05	2000		ML: CLAYEY SILT: 0/10/90, brown, low plasticity, no stain, strong odor,
	30	9:12	2000		SM: SANDY SILT, 0/10/90, minor clay, light brown, no stain, strong odor,
	35	9:17	2000		SM: SILTY SAND, 0/20/80, light brown,loose, no stain, strong odor
	40	9:19	2000		ML: SILT 0/05/95,light brown, loose, very minor plastcicity, no stain, strong odor
	55	9:30	2000		ML: SILT, 0/5/95, light brown, low plasicity, minor sand, minor clay, no stain, strong odor
	60	9:34	1500		SM: SILTY SAND, 0/30/70, light brown, loose, moist, no stain, strong odor
	65	9:37	70		ML: SAND SILTY CLAY, 0/15/85, olive brown, loose, minor plasticity, slight gray stain, moderate odor
	70	9:42	100		ML: SAND SILTY CLAY, 0/15/85, olive brown, loose, minor plasticity, minor gray stain, moderate odor
	75	9:45	125		SW: SAND, 0/95/5,red brown, loose, well graded, minor clay, no stain, minor odor

Hole Number: 10 Sampler: J. McNaboe

Hole Location: G- 8/9

Date Drilled: 4/18/2005 Start Time: 8:20 Stop Time: 9:45

Date Backfilled: 4/18/2005

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 11	5	10:19	300		SM: SILTY SAND, 0/50/50, brown, loose, dry, no stain, moderate odor
	10	10:24	30		SW: SAND, 0/100/0, light brown, well graded, loose, no stain, minor odor,
	15	10:29	100		SM: SILTY SAND, 0/50/50, brown, loose, dry,no stain, minor odor
	20	10:32	2000+		SM: SILTY SAND, 0/50/50, brown, loose, dry, no stain, strong odor
	25	10:35	2000+		SP: SAND, 0/90/10, grey brown, loose, poorly graded, fine grained, no stain, strong odor
	30	10:40	2000+		SM: SILTY SAND, 0/20/80, brown, loose, dry, very minor clay, no stain, strong odor
	35	10:44	2000+		SM: SILTY SAND, 0/50/50, brown, loose, no plasticity, no stain, strong odor
	40	10:46			Hole caved in: too close to hole # 10. Will backfill and move west.

Hole Number:	11	Sampler:	J. McNaboe
Hole Location:	G-8		
Date Drilled:	4/18/2005	Start Time:	10:10 Stop Time: 10:47
Date Backfilled:	4/18/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 12	5	11:32	1.7		SM: SILTY SAND, 0/40/60, brown, loose, no stain, no odor
	10	11:35	0		SM: SILTY SAND, 10/40/50, brown, minor gravel
	15	11:36	0		SW: SAND, 0/100/0
	20	11:40	1100		SM: SILTY SAND, 0/50/50, brown, fine sand and silt, loose, dry, no stain, strong odor
	25	11:46	1400		SM: SILTY SAND, 0/30/70, brown, loose, no stain, strong odor
	30	11:52	1000		ML: SILTY, 0/0/100, brown, loose, no stain, strong odor
	35	11:56	2000+		SM: SILTY SAND, 0/50/50, brown, very fine grained, loose, no stain, strong odor
	40	12:45	2000+		SM: SILTY SAND, 0/50/50, brown, poorly graded, fine grained, no stain, strong odor
	50	12:50	1750		ML: SILT, 0/0/100, brown, loose, no plasicity, no stain, strong odor
	55	12:59	400		ML: SILT, 0/5/95, brown, loose, minor sand, no stain, minor odor
	60	13:05	400		ML: SILT, 0/5/95, brown, loose, minor sand, no stain, minor odor
	65	13:09	400		SM: SANDY SILT, 0/30/70, brown, loose, no stain, moderate odor
	75	13:15	75		ML: SILT, 0/10/90, brown, minor sand, loose, dry, no stain, minor odor

Hole Number:	12	Sampler:	J. McNaboe
Hole Location:	F-7		
Date Drilled:	4/18/2005	Start Time:	10:36 Stop Time: 13:15
Date Backfilled:	4/18/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 13	5	13:45	0.7		ML: SANDY SILT, 0/40/60, brown, moist, no odor, no stain
	10	13:55	0		SW: SAND, 0/100/0 light brown, well graded, loose, no odor, no stain
	15	13:59	0		SC: CLAYEY SAND, 0/80/20, dark brown, well graded, minor clay, loose, no odor, no stain
	20	14:03	1580		SM: SILTY SAND, 0/50/50, light brown, loose, strong odor, no stain
	25	14:06	2000 +		SM: SILTY SAND, 0/50/50, light brown, loose, strong odor, no stain
	30	14:12	2000+		SW: SAND: 0/100/0, yellow brown, well graded, loose , no stain, strong odor
	35	14:19	1200		SM: SILTY SAND, 0/50/50, light brown, loose, no stain, strong odor
	40	14:24	2000 +		SM: SILTY SAND, 0/50/50, light brown, loose, no stain, strong odor
	45	14:27	2000 +		SM: SILTY SAND, 0/50/50, light brown, loose, no stain, strong odor
	50	14:32	450		SM: SILTY SAND, 0/50/50, light brown, loose, very minor clay, no stain, moderate odor
	55	14:37	1400		SM: SILTY SAND, 0/20/80, light brown, compacted, no stain, moderate odor
	65	14:42	185		ML: SILTY SAND, 0/30/70, light brown, minor clay, loose, dry, moderate odor, no stain
	70	14:46	80		ML: CLAYEY SILT, 0/10/90, olive brown, low plasticity, possible stain, minor odor
	75	14:51	65		SC: CLAYEY SAND, 0/80/20 brown, low plasticity, no stain, no odor

Hole Number: 13	Sampler: J. Mc Naboe
Hole Location: F-7-8	
Date Drilled: 4/18/2005	Start Time: 1:40 Stop Time: 2:55
Date Backfilled: 4/18/2005	

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 14	5	15:26	1.7		ML: SILTY CLAYEY SAND, 0/50/50, brown, loose, no odor, no stain
	10	15:29	8.5		SW: SAND, WELL GRADED, 0/100/0, light brown, loose, trace odor, no stain
	15	15:31	5.5		SM: SILTY SAND, 0/50/50, brown, loose, no odor, no stain
	20	15:34	200		SM: SILTY SAND, 0/50/50, brown, loose, no odor, no stain
	25	16:28			Hole caved in. Filled hole. Moved to location F-9.

Hole Number:	14	Sampler:	J. Mc Naboe
Hole Location:	F-8/9		
Date Drilled:	4/18/2005	Start Time:	15:23 Stop Time: 15:37
Date Backfilled:	4/18/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 15	5	16:12	0.3		SM: SILTY SANDY, 0/50/50, light brown, loose, no odor, no stain
	10	16:18	0		SW: SAND, 0/100/0, light brown, well sorted, loose, no odor, no stain
	15	16:22	0		SW: SAND, 0/100/0, light brown, well sorted, finer grained, loose, no odor, no stain
	20	16:26	0		ML: CLAYEY FINE SAND, 0/20/80, brown, micaceous, slight odor, no stain
	25	16:28	0		SM: SILTY SAND, 0/50/50, olive brown, well graded, loose, no odor, no stain
	30	16:32	9		SW: SAND: 10/90/0, light brown, well graded, minor gravel, no stain, slight odor
	35	16:35	115		SM: SILTY SAND, 0/50/50, yellow grey, mottled color, possible stain, moderate odor
	40	16:40	1100		SP: SAND, 0/100/0, yellow brown, poorly graded, fine grained, no stain, strong odor
	48	16:46	1450		SM: SILTY SAND, WELL GRADED, 0/50/50, light brown, loose, fine to very fine grained, no stain, strong odor
	55	16:50	150		SM: SILTY SAND, WELL GRADED, 0/50/50, light brown, loose, fine to very fine grained, no stain, strong odor
	60	16:56	90.1		ML: SILTY CLAYEY SAND, 0/30/70, light brown, slight plasticity, no stain, moderate odor
	65	16:59	85		ML: SILTY CLAYEY SAND, 0/30/70, light brown, slight plasticity, no stain, moderate odor
	70	17:05	53	F-10-70'	ML: SILTY CLAYEY SAND, 0/30/70, light brown, slight plasticity, no stain, no odor

Hole Number:	15	Sampler:	J. Mc Naboe
Hole Location:	F-10		
Date Drilled:	4/18/2005	Start Time:	16:08 Stop Time: 17:06
Date Backfilled:	4/18/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 16	5	8:34	1		SM: SILTY SAND, 0/50/50, brown, loose, no stain, no odor.
	10	8:36	0		SM: SILTY SAND, 0/50/50, brown, loose, no stain, no odor.
	15	8:40	0		SW: SAND, 0/100/0, yellow-brown, well graded, loose, no stain, no odor.
	20	8:46	0		SM: SILTY SAND, 0/50/50, light brown, loose, minor clay, no stain, no odor.
	25	8:50	0		SW: SAND, 0/100/0, yellow-brown, well graded, loose, no stain, no odor.
	30	8:52	8		SM: SILTY SAND, 0/50/50, brown, low plasticity, no stain, minor odor.
	35	8:57	9		SM: SILTY SAND, 0/50/50, brown, low plasticity, no stain, minor odor.
	40	9:02	10		SM: SILTY SAND, 0/50/50, brown, low plasticity, no stain, minor odor.
	45	9:06	550		ML: SANDY SILT, 0/30/70, brown, loose, no stain, moderate odor.
	50	9:10	58		ML: SANDY SILTY CLAY, 0/20/80, brown, low plasticity, minor odor.
	55	9:12	24	E-10-55	ML: SANDY SILT, 0/30/70, brown, no plasticity, minor odor, no stain.

Hole Number:	16	Sampler:	J. McNaboe
Hole Location:	E-10 (north east side adjacent to asphalt)		
Date Drilled:	4/19/2005	Start Time:	8:30 AM / Stop Time: 9:15 AM
Date Backfilled:	4/19/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 17	5	9:36	0		SM: SILTY SAND, 0/50/50, loose, no stain,
	10	9:39	0		SW: SAND, 0/100/0, well graded, loose, no stain,
	15	9:42	0		SW: FINE SAND, 0/100/0, no stain, no odor
	20	9:46	0		SM: SILTY SAND, 0/50/50, no stain, no odor
	25	9:50	0		SW: FINE SAND, 0/90/10, no stain, no odor
	30	9:53	2.5		SW: SAND, 10/90/0 slight odor.
	35	9:58	222		ML: SILTY SAND, 0/50/50, clumpy, slight odor, no stain
	40	10:01	1227		ML: FINE SILTY SAND, 0/50/50, clumpy, strong odor, no stain
	45	10:08	1628		ML: FINE SILTY SAND, 0/50/50, no stain, strong odor
	50	10:12	2000		ML: SILTY SAND, 0/40/60, strong odor, no stain,
	55	10:18	92.2		ML: SILTY SAND, 0/30/70, no stain, light odor
	60	10:22	183		ML: SILTY SAND, 0/40/60, no stain, slight odor
	65	10:26	40	E-20-65	ML: SILTY SAND, 0/40/60, no stain, slight odor

Hole Number:	17	Sampler:	T. Schweizer
Hole Location:	E-20		
Date Drilled:	4/19/2005	Start Time:	9:33 Stop Time 10:28
Date Backfilled:	4/19/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 18	5	10:50	0		SM: SILTY SAND, 10/60/30, some gravel, brown, no stain, no odor
	10	10:54	0		SW: SAND, 5/95/0, brown, no stain, no odor
	15	10:57	0		SM: SILTY SAND, 0/50/50, brown, no stain, no odor
	20	11:00	294		SM: SILTY SAND, 0/50/50, no stain, slight odor
	25	11:02	144		SW: FINE SAND, 0/90/10, light brown, no stain, slight odor
	30	11:08	49.6		SW: MEDIUM COARSE SAND, 5/95/0 light brown, slight odor, no odor,
	35	11:12	2000		SM: SILTY SAND, 0/50/50, olive brown, strong odor, no stain,
	40	11:15	2000		SM: SILTY SAND, 0/50/50, olive brown, strong odor, no stain
	45	11:19	2000		SM: SILTY SAND, 0/50/50, olive brown, no stain, strong odor
	50	11:22	2000		SM: SILTY SAND, 0/50/50, olive brown, strong odor, no stain,
	55	11:29	29.7		SM: SILTY SAND, 0/50/50, olive brown, no stain, slight odor
	60	11:34	39.5		SM: SILTY SAND, 5/40/45, olive brown, no stain, slight odor

Hole Number:	18	Sampler:	T. Schweizer
Hole Location:	E-15		
Date Drilled:	4/19/2005	Start Time:	10:46 Stop Time 11:36
Date Backfilled:	4/19/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 19	5	13:11	0		SM: SILTY SAND, 0/50/50, brown, no stain,
	10	13:15	0		SM: SAND, 5/95/0, light brown, well graded, no odor
	15	13:18	0		SM: SILTY SAND, 0/50/50, light brown, no odor
	20	13:20	84.8		SM: SILTY SAND, 0/50/50, light brown, no stain, moderate odor
	25	13:24	557		SM: SILTY SAND, 0/50/50, medium brown, strong odor
	30	13:32	179		SM: SAND, 0/90/10 slight odor, light brown
	35	13:36	1770		ML: SILTY SAND, 0/50/50, strong odor, light brown
	40	13:44	2000		ML: SILTY SAND, 0/50/50, olive brown, strong odor
	45	13:50	2000		ML: SILTY SAND, 0/40/60, olive brown, strong odor
	50	13:54	1910		ML: SILTY SAND, 0/50/50, olive brown, strong odor,
	55	13:58	269		ML: SILTY SAND, 0/30/70, dark brown, no stain, slight odor
	60	14:07	62.9		SM: SILTY SAND, 0/50/50, olive brown, slight odor

Hole Number:	19	Sampler:	T. Schweizer
Hole Location:	E-5		
Date Drilled:	4/19/2005	Start Time:	13:08 Stop Time 14:07
Date Backfilled:	4/19/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 20	5	14:35	0		SM: SILTY SAND, 0/60/40, medium brown, no odor,
	10	14:39	0		SM: SAND, 0/90/10, light brown, well graded, no odor
	15	14:40	0		SM: SILTY SAND, 0/50/90, dark brown, no odor
	20	14:45	0		SM: SILTY SAND, 0/50/50, light brown, no odor
	25	14:48	0		SM: SILTY SAND, 0/50/50, olive brown, no odor
	30	14:54	0		SM: FINE SAND, 0/90/10 no odor, olive brown
	35	14:59	22.9		SM: SILTY SAND, 0/50/50, olive brown, slight odor,
	40	15:02	64.1		SM: SILTY SAND, 0/50/50, light brown, slight odor
	45	15:06	412		ML: SILTY SAND, 0/30/70, dark brown, moderate odor
	50	15:10	73.7		ML: SILTY SAND, 0/30/70, dark brown, slight odor,
	55	15:15	26.6		ML: SILTY SAND, 0/40/60, light brown, slight odor
	60	15:20	45.7	C-6-60	ML: SILTY SAND, 0/50/50, olive brown, slight odor
	65	15:28	16.9		ML: SILTY SAND, 0/40/60, olive brown, slight odor

Hole Number:	20	Sampler:	T. Schweizer
Hole Location:	C-6		
Date Drilled:	4/19/2005	Start Time:	14:31 Stop Time 15:28
Date Backfilled:	4/19/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 21	5	15:56	0		SM: SILTY SAND, 0/70/30, medium brown, no odor,
	10	15:59	0		SAND, 0/90/10, light brown, no odor
	15	16:03	0		SILTY SAND, 0/90/10, light brown, no odor, well graded
	20	16:07	0		SM: SILTY SAND, 0/50/50, light brown, no odor
	25	16:09	0		SM: SILTY SAND, 0/50/50, medium brown, no odor
	30	16:12	0		SAND, 0/90/10, no odor, light brown
	35	16:16	3.5		ML: SILTY SAND, 0/40/60, olive gray, slight odor,
	40	16:22	25.6		SM: SILTY SAND, 0/50/50, olive brown, slight odor
	45	16:28	707		SM: SILTY SAND, 0/50/50, olive brown, strong odor
	50	16:33	49		SM: SILTY SAND, 0/50/50, olive brown, slight odor, damp
	55	16:38	88.1		ML: SILTY SAND, 0/30/70, olive brown, slight odor
	60	16:43	42.2		ML: SILTY SAND, 0/30/70, olive brown, slight odor
	65	16:47	4.9	B-6-65	ML: SILTY SAND, 0/20/80, olive gray-brown, no odor

Hole Number:	21	Sampler:	T. Schweizer
Hole Location:	B-6		
Date Drilled:	4/19/2005	Start Time:	15:48 Stop Time 16:47
Date Backfilled:	4/19/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 22	5	15:56	0		ML: SILTY SAND, 0/40/60, dark brown, no odor, cohesive
	10	15:59	0		SAND, 0/95/5, light brown, well graded, no odor
	15	16:03	0		ML: SILTY SAND, 0/40/60, medium brown, no odor
	20	16:07	0		SM: SILTY SAND, 0/50/50, light brown, loose, no odor
	25	16:09	0		SM: SILTY SAND, 0/50/50, olive brown, loose, no odor
	30	16:12	0		SAND, SAND FINE, 5/90/5, olive brown, slight odor,
	35	16:16	3.5		ML: SILTY SAND, 0/40/60, olive gray, cohesive, slight odor,
	40	16:22	25.6		SM: SILTY SAND, 0/50/50, olive brown, loose, slight odor
	45	16:28	707		SM: SILTY SAND, 0/50/50, olive brown, loose, moderate odor
	50	16:33	49		ML: SILTY SAND, 0/50/50, olive brown, cohesive, strong odor,
	55	16:38	88.1		SM: SILTY SAND, 0/50/50, dark brown, loose, moderate odor
	60	16:43	42.2		SM: SILTY SAND, 0/50/50, olive gray, loose, slight odor

Hole Number:	22	Sampler:	T. Schweizer
Hole Location:	C-7		
Date Drilled:	4/20/2005	Start Time:	08:14 Stop Time 09:16
Date Backfilled:	4/20/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 23	5	9:45	41.9		ML: SILTY SAND, 0/30/70, medium brown, slight odor, clumpy
	10	9:47	1		ML:SILTY SAND, 0/30/70, medium brown, no odor, clumpy
	15	9:49	0		ML: SILTY SAND, 0/30/70, dark brown, no odor, clumpy
	20	9:50	22.3		SM: SILTY SAND, 0/50/50, dark brown, slight odor, loose
	25	9:54	42.5		SM: SILTY SAND, 0/50/50, dark brown, slight odor, loose
	30	9:58	164		SAND, WELL GRADED, 5/90/5, medium brown, moderate odor, loose
	35				Ceased boring at 10:00 due to collapse of bore hole. Rig Stuck.

Hole Number:	23	Sampler:	T. Schweizer
Hole Location:	D-6		
Date Drilled:	4/20/2005	Start Time:	Rig unstuck at 12:40, abandoned boring.
Date Backfilled:	4/20/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 24	5	14:31	0		SM: SILTY SAND, 0/50/50, light brown, loose, no odor
	10	14:33	0		SAND: 5/90/5, light brown, well graded, loose, no odor,
	15	14:41	0		ML: SILTY SAND, 0/30/70, olive brown, cohesive, no odor
	20	14:43	0		SM: SILTY SAND, 0/50/50, olive brown, loose, no odor
	25	14:45	0		SAND, 0/90/10, olive brown, well graded, loose, no odor
	30	14:52	2.5		SM:SILTY SAND, 5/50/45, light brown, well graded, loose, slight odor,
	35	14:56	64.6		SM: SILTY SAND, 0/50/50, olive brown, slight odor, loose
	40	15:00	188		SM: SILTY SAND, 0/50/50, olive brown, moderate odor, loose
	45	15:03	929		SM: SILTY SAND, 0/50/50, olive brown, loose, minor clay, moderate odor
	50	15:12	240		SM: SILTY SAND, 0/50/50, olive brown,loose. minor clay, no stain, moderate odor
	55	15:20	40		SM: SILTY SAND, 0/50/50, olive brown, loose, minor clay, no stain, moderate odor
	60	15:22	55		SM: SILTY SAND, 0/50/50, olive brown, loose, minor clay, no stain, moderate odor

Hole Number: 24 Sampler: T. Schweizer

Hole Location: K-6

Date Drilled: 4/20/2005 Start Time: 14:25 Stop Time: 15:22

Date Backfilled: 4/20/2005

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 25	5	15:38	0		SM: SILTY SAND, 0/50/50, light brown, course, no stain, no odor,
	10	15:42	0		SW: SAND: 0/100/0, brown, well graded, no stain, slight odor, loose
	15	15:45	800		SM: SILTY SAND, 0/50/50, loose, no stain, strong odor,
	20	15:48	1700		SM: SILTY SAND, 0/50/50, light brown,very fine grained, loose, no stain, strong odor
	25	15:51	2000		SP: SAND, 0/80/20, brown, poorly graded, fine grained, no stain, strong odor,
	30	15:56	1000		SAND, 10/90/0, yellow-brown, well graded, minor angular gravel to 1/8", no stain, strong odor
	35	16:02	2000		SM: SILTY SAND, 0/40/60, olive brown, loose, no stain, no plasticity, strong odor
	40	16:06	1180		ML: SILTY SAND, 0/40/60, light brown, dry, compacted, no stain, strong odor
	45	16:11	2000		ML: SANDY CLAYEY SILT, 0/30/70, brown, slight plasicity, no stain, strong odor
	50	16:14	450		ML: SILTY SAND, 0/40/60, brown, poorly graded, fine grained, no stain, moderate odor
	55	16:20	145		SM: SILTY SAND, 0/50/50, brown, dry, well graded, no stain, moderate odor
	60	16:25	45		SM: SILTY SAND, 0/70/30, olive brown, loose, poorly graded, possible stain, slight odor
	65	16:29	55	I-6-65	SM: SILTY SAND, 0/70/30, olive brown, moist, loose, poorly graded, possible stain, slight odor

Hole Number: 25	Sampler: J. McNaboe
Hole Location: I-6	
Date Drilled: 4/20/2005	Start Time: 15:20 Stop Time: 16:30
Date Backfilled: 4/20/2005	

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 26	5	8:32	0.5		ML: SILTY SAND, 0/50/50, red brown, fine grained, loose, no stain, no odor
	10	8:47	0		SW: SAND, 0/80/20, WELL GRADED, brown, no stain, no odor, loose, dry
	15	8:50	0		SM: SILTY SAND, 0/50/50, light brown, loose, no stain, strong odor
	20	8:55	500		SM: SILTY SAND, 0/50/50, light brown, no stain, strong odor, loose,
	25	8:56	1600		SP:SAND, WELL GRADED, 0/100/0, olive brown, loose, poorly graded, fine grained, possible stain, strong odor
	30	9:06	2000		SW: SAND, 10/90/0, yellow-brown, well graded, minor gravel to 1/8" thick, no stain, strong odor
	35	9:12	1400		SP: SAND, 0/100/0, moderate odor, yellow brown, fine grained, loose, no stain
	40	9:15	2000		SM: SILTY SAND, 0/50/50, strong odor, poorly graded, fine grained, loose, possible stain, strong odor
	45	9:18	2000		SM: SILTY SAND, 0/50/50, strong odor, olive brown, loose, gray stain
	50	9:21	220		ML: SILTY SAND, 0/30/70, brown, minor clay, slight stain, minor odor
	55	9:31	185		ML: SILTY SAND, 0/30/70, brown, minor clay, slight stain, minor odor
	60	9:36	107		SM: SILTY SAND, 0/50/50, loose, grey stain, fine, moderate odor
	65	9:39	29.1	I-8-65	SM: SILTY SAND, 0/50/50, loose, olive brown, grey stain, fine to med. Grained, slight odor
					medium

Hole Number:	26	Sampler:	J. McNaboe
Hole Location:	I-8		
Date Drilled:	4/21/2005	Start Time:	8:28 Stop Time: 9:41
Date Backfilled:	4/21/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 26	5	8:32	0.5		ML: SILTY SAND, 0/50/50, red brown, fine grained, loose, no stain, no odor
	10	8:47	0		SW: SAND, 0/80/20, WELL GRADED, brown, no stain, no odor, loose, dry
	15	8:50	0		SM: SILTY SAND, 0/50/50, light brown, loose, no stain, strong odor
	20	8:55	500		SM: SILTY SAND, 0/50/50, light brown, loose, no stain, strong odor
	25	8:56	1600		SP:SAND, 0/100/0, olive brown, loose, poorly graded, fine grained, possible stain, strong odor
	30	9:06	2000		SW: SAND, 10/90/0, yellow-brown, well graded, minor gravel to 1/8" thick, no stain, strong odor
	35	9:12	1400		SP: SAND, 0/100/0, moderate odor, yellow brown, fine grained, loose, no stain
	40	9:15	2000		SM: SILTY SAND, 0/50/50, strong odor, poorly graded, fine grained, loose, possible stain, strong odor
	45	9:18	2000		SM: SILTY SAND, 0/50/50, strong odor, olive brown, loose, gray stain
	50	9:21	220		ML: SILTY SAND, 0/30/70, brown, minor clay, slight stain, minor odor
	55	9:31	185		ML: SILTY SAND, 0/30/70, brown, minor clay, slight stain, minor odor
	60	9:36	107		SM: SILTY SAND, 0/50/50, loose, grey stain, fine, moderate odor
	65	9:39	29.1	I-8-65	SM: SILTY SAND, 0/50/50, olive brown, loose, grey stain, fine to medium grained slight odor

Hole Number: 26	Sampler: J. McNaboe
Hole Location: I-8	
Date Drilled: 4/21/2005	Start Time: 8:28 Stop Time: 9:41
Date Backfilled: 4/21/2005	

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 27	5	12:23	0		ML: SILTY SAND, 0/30/70, olive brown, cohesive, no odor
	10	12:25	0		SW: SAND, 0/90/10, light brown, well graded, no odor, loose
	15	12:29	0		ML: SILTY SAND, 0/20/80, olive gray, very cohesive, no odor
	20	12:34	381		SM: SILTY SAND, 0/50/50, olive brown, moderate odor, loose
	25	12:35	800		ML: SILTY SAND, well graded, 0/30/70, olive brown, strong odor, cohesive
	33	12:37	1685		ML: SILTY SAND, 0/40/60, olive-brown, cohesive, strong odor
	35	12:42	1677		SM: SILTY SAND, 0/50/50, olive brown, loose, strong odor
	40	12:54	2000		ML: SILTY SAND, 0/40/60, olive gray, mildly cohesive, strong odor
	45	12:56	2000		ML: SILTY SAND, 0/40/60, olive grey, cohesive, strong odor
	50	13:01	1994		ML: SILTY SAND, 0/40/60, olive gray, cohesive, strong odor
	55	13:06	441		SM: SILTY SAND, 0/60/40, dark brown, loose, moderate odor
	60	13:10	215		SM: SILTY SAND, 0/50/50, olive brown, loose, moderate odor
	65	13:17	123		SM: SILTY SAND, 0/50/50, olive grey, loose, slight odor

Hole Number:	27	Sampler:	T. Schweizer
Hole Location:	J-7		
Date Drilled:	4/21/2005	Start Time:	12:15 Stop Time: 13:17
Date Backfilled:	4/21/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 28	5	13:55	0		SM: SILTY SAND, 0/50/50, light brown, loose, no odor
	10	13:58	0		SM: SILTY SAND, 0/60/40, light brown, loose, no odor
	15	14:02	0		SM: SILTY SAND, 0/50/50, olive brown, loose, no odor
	20	14:06	0		ML: SILTY SAND, 0/40/60, olive brown, no odor, cohesive
	25	14:08	0		SM: SILTY SAND, 0/50/50, olive brown, loose, no odor
	30	14:21	285		SW: SAND, 0/90/10, olive-brown, loose, slight odor
	35	14:26	177		SM: SILTY SAND, 0/50/50, olive brown, loose, moderate odor
	40	14:30	360		SM: SILTY SAND, 0/40/60, olive brown, cohesive areas, moderate odor
	45	14:37	1799		SM: SILTY SAND, 0/50/50, olive brown, loose, strong odor
	50	14:40	384		SM: SILTY SAND, 0/30/70, olive brown, minor clay, moderate odor
	55	14:46	323		ML: SILTY SAND, 0/30/70, olive brown, minor clay, moderate odor
	60	14:48	40.5		ML: SILTY SAND, 0/40/60, olive brown, minor clay, slight odor

Hole Number:	28	Sampler:	T. Schweizer
Hole Location:	I-9		
Date Drilled:	4/21/2005	Start Time:	13:48 Stop Time: 14:48
Date Backfilled:	4/21/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 29	5	15:26	0		SM: SILTY SAND, 0/50/50, olive brown, loose, no odor
	10	15:30	0		SW: SAND, 0/95/5, light brown, well graded, loose, no odor,
	15	15:33	0		SW: SAND, 0/40/60, light brown, well graded, loose, no odor
	20	15:35	0		ML: SILTY SAND, 0/40/60, olive brown, loose, no odor
	25	15:38	0		SM: SILTY SAND, 0/50/50, olive brown, minor clay, no odor,
	30	15:42	12.4		SW: SAND, 0/90/10, light olive-brown, loose, fine grained, slight odor
	35	15:45	92.8		ML: SILTY SAND, 0/30/70, olive brown, minor clay, slight odor
	40	15:49	167		ML: SILTY SAND, 0/40/60, olive brown, minor clay, moderate odor,
	45	15:53	1802		ML: SILTY SAND, 0/50/50, olive brown, minor clay, strong odor
	50	15:59	1677		SM: SILTY SAND, 0/40/60, olive grey, loose, strong odor
	55	16:04	168		SM: SILTY SAND, 0/50/50, dark brown, loose, slight odor
	60	16:10	32	E-4-60	SM: SILTY SAND, 0/50/50, olive brown, loose, slight odor

Hole Number:	29	Sampler:	T. Schweizer
Hole Location:	E-4		
Date Drilled:	4/21/2005	Start Time:	15:21 Stop Time: 16:10
Date Backfilled:	4/21/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 30	5	8:23	0		ML: SILTY SAND, 0/30/70, olive brown, clumpy, no odor
	10	8:26	0		SW: SAND, 10/85/5, light brown, well graded, loose, no odor,
	15	8:28	0		SM: SILTY SAND, 0/50/50, olive brown, loose, no odor
	20	8:30	0		ML: SILTY SAND, 0/40/60, olive brown, slight cohesive, no odor
	25	8:33	0		SM: SILTY SAND, 0/75/25, olive brown, no odor, loose
	30	8:38	0		SW: SAND, 10/85/5, olive-brown, well graded, loose, no odor
	35	8:42	35.5		ML: SILTY SAND, 0/30/70, olive brown, minor clay, slight odor
	40	8:46	73.7		SM: SILTY SAND, 0/50/50, olive brown, loose, slight odor
	45	8:51	876		ML: SILTY SAND, 0/30/70, strong odor, olive brown, minor clay
	50	8:57	134		SM: SILTY SAND, 0/40/60, olive brown, loose, medium odor
	55	9:01	75.3		ML: SILTY SAND, 10/40/60, dark brown, clumpy, slight odor
	60	9:08	18.6	J-9-60	SM: SILTY SAND, 0/50/50, loose, olive brown, slight odor

Hole Number:	30	Sampler:	T. Schweizer
Hole Location:	J-9		
Date Drilled:	4/22/2005	Start Time:	8:16 Stop Time: 9:08
Date Backfilled:	4/22/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 31	5	9:35	0		ML: SILTY SAND, 0/30/70, dark brown, minor clay, no odor
	10	9:41	5.8		SW: SAND, 0/90/10, olive brown, well graded, loose, no odor
					Abandoned boring at 11' due to collapse

Hole Number: 31 Sampler: T. Schweizer

Hole Location: H-7

Date Drilled: 4/22/2005 Start Time: 9:32 Stop Time: 9:48

Date Backfilled: 4/22/2005

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 32	5	10:01	0		ML: SILTY SAND, 0/30/70, olive brown, cohesive, no odor,
	10	10:07	0		SW: SAND, 0/90/10, light brown, well graded, loose, no odor
	15	10:11	1.1		SM: SILTY SAND, 0/50/50, olive brown, loose, no odor
	20	10:13	0		SM: SILTY SAND, 0/50/50, olive brown, loose, minor clay, no odor
	25	10:16	0		SM: SILTY SAND, 0/40/60, olive brown, loose, no odor
	30	10:20	4.9		SW: SAND, 5/90/5, olive-brown, well graded, loose, slight odor
	35	10:25	932		ML: SILTY SAND, 0/30/70, olive brown, minor clay, slight odor
	40	10:29	126		ML: SILTY SAND, 0/40/60, olive brown, loose, slight odor
	45	10:33	1730		ML: SILTY SAND, 0/40/60, olive brown, minor clay, strong odor
	50	10:37	1227		ML: SILTY SAND, 0/30/70, olive brown, minor clay, strong odor
	55	10:44	237		ML: SILTY SAND, 0/40/60, olive brown, slightly cohesive, medium odor
	60	10:52	31.5	J-9-60	SM: SILTY SAND, 0/50/50, olive brown, loose, slight odor
	65	11:01	24.3		ML: SILTY SAND, 0/45/55, olive brown, minor clay, slight odor

Hole Number:	32	Sampler:	T. Schweizer
Hole Location:	D-8		
Date Drilled:	4/22/2005	Start Time:	9:57 Stop Time: 11:01
Date Backfilled:	4/22/2005		

RAM Environmental

Mardikian Remediation Project

Hole #	Depth	Time	PID	Lab Sample No.	Comments/Lithology
# 33	5	12:24	0		ML: SILTY SAND, 0/45/55, olive brown, loose, no odor,
	10	12:28	0		SW: SAND, 0/95/5, light brown, well graded, loose, damp, no odor
	15	12:30	0		SM: SILTY SAND, 0/50/50, loose, no odor
	20	12:34	0		ML: SILTY SAND, 0/30/70, olive brown, clumpy, no odor
	25	12:39	0		SM: SILTY SAND, 0/50/50, olive brown, loose, no odor
	30	12:34	0		SW: SAND 0/95/5, olive-brown, well graded, loose, no odor
	35	12:45	22.6		SM: SILTY SAND, 0/50/50, olive brown, loose, slight odor
	40	12:47	42.7		SM: SILTY SAND, 0/50/50, olive brown, loose, slight odor
	50	12:55	802		ML: SILTY SAND, 0/30/70, olive brown, minor clay, strong odor
	55	13:10	230		ML: SILTY SAND, 0/30/70, olive brown, loose, very minor clay, moderate odor
	60	13:13	72.6		ML: SILTY SAND, 0/30/70, olive brown, slightly cohesive, slight odor
	65	13:20	41.6		SM: SILTY SAND, 0/50/50, olive gray, loose, slight odor

Hole Number:	33	Sampler:	T. Schweizer
Hole Location:	C-4		
Date Drilled:	4/22/2005	Start Time:	12:20 Stop Time: 13:20
Date Backfilled:	4/22/2005		

APPENDIX C

LABORATORY RESULTS - SOILS

Zymax
71 Zoco Lane
San Luis Obispo CA 93401
vox 805.544.4696
fax 805.544.8226

CLIENT EDD ☐ LUFT EDF ☐ DW EDT ☐

CHAIN of CUSTODY

Report to: RICHARD CASAGRANDE
Company: RAM ENV. ENG. SERVICES INC
Address: 2103-20th ST
BAKERSFIELD, CA. 93301

vox (661) 3246152 fax 3246172
proj: 200102
proj #: MARDIKIAN
sampler: Richard Casagrande

Turnaround Time: ASAP ☐ 48 hr ☐ 12 hr ☐ 72 hr ☒ 24 hr ☐ std ☐

ANALYSIS REQUESTED

ZymaX use only	SAMPLE DESCRIPTION	Date Sampled	Time	Matrix	Preserve	Hydrocarbon #8081	Pesticides		LUFT 5 metals	Cd, Cr, Ni, Pb, Zn							# of containers	Remarks
39308-1	Composited Soils #1	3-11-05		Soils		X				X								Mason Jars
-2	Composited Soils #2	3-11-05		Soils		X				X								
																		8081 150
																		17 CAM-210
																		5 LUFT-130
																		x 1.33=

Comments

Relinquished by:
Signature: [signature]
Print: RICHARD CASAGRANDE
Company: RAM ENV. ENG.
Date: 3-14-05 Time: 5PM

Received by:
Signature:
Print:
Company:
Date: Time:

Sample integrity upon receipt:
Samples received intact ☐
Samples received cold ☐
Custody seals ☐
Correct container types ☐

Bill 3rd party:

PO#:
Quote yes no

Relinquished by:
Signature:
Print:
Company:
Date: Time:

Received by ZymaX envirotechnology, inc:
Signature: Dana Carmichael
Print: Dana Carmichael
Company: Zymax
Date: 3/16/05 Time: 0830

mail: login@ZymaXusa.com

Page ___ of ___

ZymaX envirotechnology

REPORT OF ANALYTICAL RESULTS

Client: Richard Casagrande RAM Environmental Engineering 2103 20th St. Bakersfield, CA 93301	Lab Number: 39308-1 Collected: 03/11/05 Received: 03/16/05 Matrix: Soil
Project: Mardikian Project Number: 200102 Collected by: Richard Casagrande	Sample Description: Composited Soils #1 Analyzed: 03/17/05 Method: EPA 8081

CONSTITUENT	PQL* mg/kg	Soil Screening DAF 20	DAF 1	PRG	RESULT** mg/kg			TTLC, STLC
CHLORINATED PESTICIDES								
Aldrin	0.002				ND			
Alpha-BHC	0.002				ND			
Beta-BHC	0.002				ND			
Delta-BHC	0.002				ND			
Gamma-BHC (Lindane)	0.002				ND			
Chlordane	0.1				ND			
4,4'-DDD	0.002				ND	~~1.0~~		
4,4'-DDE	0.002				0.071	1.0	0.1	
4,4'-DDT	0.002				0.029	1.0	0.1	
Dieldrin	0.002	3.2	2.0	7.0	0.003	1.0	0.1	
Endosulfan I	0.002				ND			
Endosulfan II	0.002				ND			
Endosulfan sulfate	0.002				ND			
Endrin	0.002				ND			
Endrin aldehyde	0.002				ND			
Endrin ketone	0.002				ND			
Heptachlor	0.002				ND			
Heptachlor epoxide	0.002				ND			
Methoxychlor	0.002				ND			
Toxaphene	0.1				ND			

ZymaX envirotechnology, Inc. is certified by CA Department of Health Services: Laboratory #1717

*PQL - Practical Quantitation Limit

**Results listed as ND would have been reported if present at or above the listed PQL.

Note: Extracted by EPA 3550 on 03/16/05.

Submitted by,
ZymaX envirotechnology, Inc.

Dwain Zsadanyi
Project Manager

GC #8 (ECD)
39308-1u.xls
DEZ/aa/yi/kt/cr

805.544.4696
www.ZymaXusa.com

71 Zaca Lane
San Luis Obispo CA 93401
fax 805.544.8226

ZymaX envirotechnology

REPORT OF ANALYTICAL RESULTS

Client:	Richard Casagrande RAM Environmental Engineering 2103 20th St. Bakersfield, CA 93301

Lab Number:	39308-1
Collected:	03/11/05
Received:	03/16/05
Matrix:	Soil

Project:	Mardikian
Project Number:	200102
Collected by:	Richard Casagrande

Sample Description:	Composited Soils #1
Analyzed:	03/16/05
Method:	EPA 6020

CONSTITUENT	PQL* mg/kg	Soil Screening level	PRG	RESULT** mg/kg	TTLC	STLC
TOTAL METALS						
Cadmium	1.0			ND		
Chromium	1.0			9.3		
Lead	1.0			14.	1,000	5.0
Nickel	1.0			~~6.6~~	2,000	~~20.~~
Zinc	1.0	12,000	100,000	51.	5,000	250

ZymaX envirotechnology, inc. is certified by CA Department of Health Services: Laboratory #1717

*PQL - Practical Quantitation Limit

**Results listed as ND would have been reported if present at or above the listed PQL.

Submitted by,
ZymaX envirotechnology, inc.

Dwain Zsadanyi
Project Manager

39308-1m.xls
DEZ/ee/mm/lb

Lead compounds - organic - TTLC - 13

805.544.4696
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71 Zaca Lane
San Luis Obispo CA 93401
fax 805.544.6226

ZymaX envirotechnology

REPORT OF ANALYTICAL RESULTS

Client: Richard Casagrande RAM Environmental Engineering 2103 20th St. Bakersfield, CA 93301	Lab Number: 39308-2 Collected: 03/11/05 Received: 03/16/05 Matrix: Soil
Project: Mardikian Project Number: 200102 Collected by: Richard Casagrande	Sample Description: Composited Soils #2 Analyzed: 03/17/05 Method: EPA 8081

CONSTITUENT	PQL* mg/kg	RESULT** mg/kg
CHLORINATED PESTICIDES		
Aldrin	0.002	ND
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Delta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.002	ND
Chlordane	0.1	ND
4,4'-DDD	0.002	ND
4,4'-DDE	0.002	0.063
4,4'-DDT	0.002	0.025
Dieldrin	0.002	0.003
Endosulfan I	0.002	ND
Endosulfan II	0.002	ND
Endosulfan sulfate	0.002	ND
Endrin	0.002	ND
Endrin aldehyde	0.002	ND
Endrin ketone	0.002	ND
Heptachlor	0.002	ND
Heptachlor epoxide	0.002	ND
Methoxychlor	0.002	ND
Toxaphene	0.1	ND

ZymaX envirotechnology, inc. is certified by CA Department of Health Services: Laboratory #1717

*PQL - Practical Quantitation Limit

**Results listed as ND would have been reported if present at or above the listed PQL.

Note: Extracted by EPA 3550 on 03/16/05.

Submitted by,
ZymaX envirotechnology, Inc.

Dwain Zsadanyi
Project Manager

GC #8 (ECD)
39308-2u.xls
DEZ/ee/yl/kt/cr

ZymaX envirotechnology

REPORT OF ANALYTICAL RESULTS

Client: Richard Casagrande RAM Environmental Engineering 2103 20th St. Bakersfield, CA 93301	Lab Number: 39308-2 Collected: 03/11/05 Received: 03/16/05 Matrix: Soil
Project: Mardikian Project Number: 200102 Collected by: Richard Casagrande	Sample Description: Composited Soils #2 Analyzed: 03/18/05 Method: EPA 6020

CONSTITUENT	PQL* mg/kg	RESULT** mg/kg
TOTAL METALS		
Cadmium	1.0	ND
Chromium	1.0	11.
Lead	1.0	19.
Nickel	1.0	7.5
Zinc	1.0	63.

ZymaX envirotechnology, Inc. is certified by CA Department of Health Services: Laboratory #1717

*PQL - Practical Quantitation Limit

**Results listed as ND would have been reported if present at or above the listed PQL.

Submitted by,
ZymaX envirotechnology, Inc.

Dwain Zsadanyi
Project Manager

39308-2m.xls
DEZ/ee/mm/lb

PROVERA ANALYTICAL LABORATORIES

Chain of Custody Form

Client Name: RAM Environmental

Project Name: Mardikian

Client Address: 2103 20th Street BKSFD 93301

Project Manager: R. Casagrande

Sampler Name:

Sample Date	Sample Time	Sample Description and Container Type	BTEX (EPA 8021b)	MTBE (EPA 8021b)	TPH Gasoline (8015M)	TPH Diesel (8015M)	Volatiles (EPA 8260b)	5 Oxygenates (EPA 8260b)	7 Oxygenates (EPA 8260b)	MTBE (EPA 8260b)	Lead scavengers (8260b)	BTEX (8260b)		Comments
4/13/5	1325	E-5-65'			X					X		X		P07748-001

Analysis Requested

Sample Matrix: [ ] Aqueous [X] Soil [ ] Acidified

Turnaround Time Requested: 24 Hour ____ 48 Hour ____ 5-Day ____ Standard ____

Relinquished By: [signature] Date: 4/18/5

Received By: [signature] Date: 4/18/05

Relinquished By: Date:

Received By: Date:

ProVera
Analytical Laboratories, Inc.

Laboratory Report

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project Name: **Mardikian**

Matrix: Soil
Sampled by: Ram Environmental

TESTS: TPH Gas by EPA 8015M

TPH g Analysis: 4/22/2005
Date of Report: 4/25/2005
Units: mg/Kg

Sample #: Date Sampled: Sample Description:	7748-001 4/13/2005 E-5-65'	**DLmg/Kg**
TPH Gasoline	0.62*	0.30
Surrogate Recovery %	90	

DL = Detection Limit
ND - Non-Detect at given DL
*TPHG result does not include MTBE

Analyst: Alexander Candia

5221 Woodmere Drive, Bakersfield, CA 93313
Phone:(661) 827-5240 Fax: (661)827-5244

ProVera
Analytical Laboratories, Inc.

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian**
Analysis Type: **EPA Method 8260B**
Analysis Date **4/22/2005**
Report Date : **4/22/2005**
Sample ID : **7748-001 E-5-65'**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	0.48	mg/Kg	0.05	1
BTEX Components				
Benzene	ND	mg/Kg	0.05	1
Toluene	ND	mg/Kg	0.05	1
Ethylbenzene	ND	mg/Kg	0.05	1
m, p & o Xylenes	ND	mg/Kg	0.05	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	47	95%
1,2-Dichloroethane-d4	43	86%
Toluene-d8	48	97%
p-Bromofluorobenzene (BFB)	53	106%

Principal Analyst: Alexander Candia

5221 Woodmere Drive, Bakersfield, CA 93313
Phone:(661) 827-5240 Fax: (661)827-5244

ProVera
Analytical Laboratories, Inc.

EPA 8260B QA-QC Report
EPA 8015M QA-QC Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Projects Covered by this QA-QC: **Mardikian**
Analysis Date: **4/22/2005**
Matrix: **Soil**

BFB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	42	84%
1,2-Dichloroethane-d4	44	88%
Toluene-d8	46	92%
p-Bromofluorobenzene (BFB)	47	94%

IB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	51	102%
1,2-Dichloroethane-d4	52	104%
Toluene-d8	48	96%
p-Bromofluorobenzene (BFB)	49	98%

MS:	**Results**	**% Recovery**
1,1-Dichloroethene	45	90%
Trichloroethene	46	92%
Chlorobenzene	46	92%
Toluene	45	90%
Benzene	47	94%
p-Bromofluorobenzene (BFB)	51	102%

MSD:	**Results**	**% Recovery**
1,1-Dichloroethene	47	94%
Trichloroethene	49	98%
Chlorobenzene	52	104%
Toluene	51	102%
Benzene	45	90%
p-Bromofluorobenzene (BFB)	50	100%

8015M-TPHG

	%Recovery
BFB	97%
IB	97%
MS	91%
MSD	94%

5221 Woodmere Drive, Bakersfield, CA 93313
Phone:(661) 827-5240 Fax: (661)827-5244

PROVERA ANALYTICAL LABORATORIES

Chain of Custody Form

Client Name: RAM ENVIRONMENTAL

Project Name: MARDIKIAN

Client Address: 2103 20th STREET, Bakersfield, 93301

Project Manager: R. CASAGRANDE

Sampler Name:

Analysis Requested

Sample Date	Sample Time	Sample Description and Container Type	BTEX (EPA 8021b)	MTBE (EPA 8021b)	TPH Gasoline (8015M)	TPH Diesel (8015M)	Volatiles (EPA 8260b)	5 Oxygenates (EPA 8260b)	7 Oxygenates (EPA 8260b)	MTBE (EPA 8260b)	Lead scavengers (8260b)	BTEX (8260b)		Comments
4-15-05	1326	H-11B-45'. brass tube			X					X		X		D07749-001
		~~H-~~												
4-15-5	0915	H-8-65' brass tube			X					X		X		-002

Sample Matrix: [ ] Aqueous [X] Soil [ ] Acidified

Turnaround Time Requested: 24 Hour ____ 48 Hour ____ 5-Day ____ Standard X

Relinquished By: [signature] Date: 4/18/5 Relinquished By: Date:

Received By: [signature] Date: 4/18/05 Received By: Date:

ProVera
Analytical Laboratories, Inc.

Laboratory Report

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project Name: **Mardikian**

Matrix: Soil
Sampled by: R. Casagrande

TESTS: TPH Gas by EPA 8015M

TPH g Analysis: 4/22/2005
Date of Report: 4/25/2005
Units: mg/Kg

Sample #: Date Sampled: Sample Description:	7749-001 4/15/2005 H-11B-45'	7749-002 4/15/2005 H-8-65'	**DLmg/Kg**
TPH Gasoline	1.1	.52*	0.30
Surrogate Recovery %	100	98	

DL = Detection Limit
ND - Non-Detect at given DL
*TPHG result does not include MTBE

Analyst: Alexander Candia

5221 Woodmere Drive, Bakersfield, CA 93313
Phone:(661) 827-5240 Fax: (661)827-5244

ProVera
Analytical Laboratories, Inc.

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian**
Analysis Type: **EPA Method 8260B**
Analysis Date **4/22/2005**
Report Date : **4/22/2005**
Sample ID : **7749-001 H-11B-45'**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	0.09	mg/Kg	0.05	1
BTEX Components				
Benzene	ND	mg/Kg	0.05	1
Toluene	ND	mg/Kg	0.05	1
Ethylbenzene	ND	mg/Kg	0.05	1
m, p & o Xylenes	ND	mg/Kg	0.05	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	46	92%
1,2-Dichloroethane-d4	46	91%
Toluene-d8	46	92%
p-Bromofluorobenzene (BFB)	50	101%

Principal Analyst: Alexander Candia

5221 Woodmere Drive, Bakersfield, CA 93313
Phone:(661) 827-5240 Fax: (661)827-5244

ProVera
Analytical Laboratories, Inc.

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian**
Analysis Type: **EPA Method 8260B**
Analysis Date **4/22/2005**
Report Date : **4/22/2005**
Sample ID : **7749-002 H-8-65'**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	0.68	mg/Kg	0.05	1
BTEX Components				
Benzene	ND	mg/Kg	0.05	1
Toluene	ND	mg/Kg	0.05	1
Ethylbenzene	ND	mg/Kg	0.05	1
m, p & o Xylenes	ND	mg/Kg	0.05	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	46	92%
1,2-Dichloroethane-d4	40	80%
Toluene-d8	41	81%
p-Bromofluorobenzene (BFB)	45	91%

Principal Analyst: Alexander Candia

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EPA 8260B QA-QC Report
EPA 8015M QA-QC Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Projects Covered by this QA-QC: **Mardikian**
Analysis Date: **4/22/2005**
Matrix: **Soil**

BFB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	42	84%
1,2-Dichloroethane-d4	44	88%
Toluene-d8	46	92%
p-Bromofluorobenzene (BFB)	47	94%

IB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	51	102%
1,2-Dichloroethane-d4	52	104%
Toluene-d8	48	96%
p-Bromofluorobenzene (BFB)	49	98%

MS:	**Results**	**% Recovery**
1,1-Dichloroethene	45	90%
Trichloroethene	46	92%
Chlorobenzene	46	92%
Toluene	45	90%
Benzene	47	94%
p-Bromofluorobenzene (BFB)	51	102%

MSD:	**Results**	**% Recovery**
1,1-Dichloroethene	47	94%
Trichloroethene	49	98%
Chlorobenzene	52	104%
Toluene	51	102%
Benzene	45	90%
p-Bromofluorobenzene (BFB)	50	100%

8015M-TPHG

	%Recovery
BFB	97%
IB	97%
MS	91%
MSD	94%

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PROVERA ANALYTICAL LABORATORIES

Chain of Custody Form

Client Name: RAM Environmental

Project Name: Mardikian Remediation, #200102

Client Address:

Project Manager: R. Casagrande

Sampler Name: J. McNabee

Sample Matrix: [ ] Aqueous [X] Soil [ ] Acidified

Sample Date	Sample Time	Sample Description and Container Type	BTEX (EPA 8021b)	MTBE (EPA 8021b)	TPH Gasoline (8015M)	TPH Diesel (8015M)	Volatiles (EPA 8260b)	5 Oxygenates (EPA 8260b)	7 Oxygenates (EPA 8260b)	MTBE (EPA 8260b)	Lead scavengers (8260b)	BTEX (8260b)	Sample #	Comments
4-18-05	17:05	Stainless tube, Soil; F-10-70			X					X		X	F-10-70	PO 7751-001
4-19-05	0912	Stainless tube, soil E-10-55			X					X		X	E-10-55	-002

Turnaround Time Requested: 24 Hour ____ 48 Hour ____ 5-Day ____ Standard ✓

Relinquished By: [signature]	Date: 4-19-05	Relinquished By:	Date:
Received By: [signature]	Date: 4-19-05	Received By:	Date:

ProVera
Analytical Laboratories, Inc.

Laboratory Report

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project Name: **Mardikian (200102)**

Matrix: Soil
Sampled by: J. McNaboe

TESTS: TPH Gas by EPA 8015M

TPH g Analysis: 4/22/2005
Date of Report: 4/25/2005
Units: mg/Kg

Sample #: Date Sampled: Sample Description:	7751-001 4/18/2005 F-10-70	7751-002 4/19/2005 E-10-55	**DLmg/Kg**
TPH Gasoline	ND*	.69*	0.30
Surrogate Recovery %	90	98	

DL = Detection Limit
ND - Non-Detect at given DL
*TPHG result does not include MTBE

Analyst: Alexander Candia

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Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian Remediation (#200102)**
Analysis Type: **EPA Method 8260B**
Analysis Date **4/22/2005**
Report Date : **4/25/2005**
Sample ID : **7751-001 F-10-70**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	0.61	mg/Kg	0.05	1
BTEX Components				
Benzene	ND	mg/Kg	0.05	1
Toluene	ND	mg/Kg	0.05	1
Ethylbenzene	ND	mg/Kg	0.05	1
m, p & o Xylenes	ND	mg/Kg	0.05	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	48	95%
1,2-Dichloroethane-d4	49	98%
Toluene-d8	47	93%
p-Bromofluorobenzene (BFB)	51	102%

Principal Analyst: Alexander Candia

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Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian Remediation (#200102)**
Analysis Type: **EPA Method 8260B**
Analysis Date **4/22/2005**
Report Date : **4/25/2005**
Sample ID : **7751-002 E-10-55**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	0.39	mg/Kg	0.05	1
BTEX Components				
Benzene	ND	mg/Kg	0.05	1
Toluene	0.07	mg/Kg	0.05	1
Ethylbenzene	ND	mg/Kg	0.05	1
m, p & o Xylenes	ND	mg/Kg	0.05	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	42	83%
1,2-Dichloroethane-d4	57	114%
Toluene-d8	41	82%
p-Bromofluorobenzene (BFB)	49	99%

Principal Analyst: Alexander Candia

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ProVera
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EPA 8260B QA-QC Report
EPA 8015M QA-QC Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Projects Covered by this QA-QC: **Mardikian**
Analysis Date: **4/22/2005**
Matrix: **Soil**

BFB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	42	84%
1,2-Dichloroethane-d4	44	88%
Toluene-d8	46	92%
p-Bromofluorobenzene (BFB)	47	94%

IB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	51	102%
1,2-Dichloroethane-d4	52	104%
Toluene-d8	48	96%
p-Bromofluorobenzene (BFB)	49	98%

MS:	**Results**	**% Recovery**
1,1-Dichloroethene	45	90%
Trichloroethene	46	92%
Chlorobenzene	46	92%
Toluene	45	90%
Benzene	47	94%
p-Bromofluorobenzene (BFB)	51	102%

MSD:	**Results**	**% Recovery**
1,1-Dichloroethene	47	94%
Trichloroethene	49	98%
Chlorobenzene	52	104%
Toluene	51	102%
Benzene	45	90%
p-Bromofluorobenzene (BFB)	50	100%

8015M-TPHG

	%Recovery
BFB	97%
IB	97%
MS	91%
MSD	94%

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PROVERA ANALYTICAL LABORATORIES

Chain of Custody Form

Client Name: RAM ENVIRONMENTAL

Project Name: MARDIKIAN

Client Address: 2103 20th STREET

Project Manager: R. CASAGRANDE

Sampler Name: J. McNABOE / T. Schweizer

Sample Matrix: [ ] Aqueous [X] Soil [ ] Acidified

Sample Date	Sample Time	Sample Description and Container Type	BTEX (EPA 8021b)	MTBE (EPA 8021b)	TPH Gasoline (8015M)	TPH Diesel (8015M)	Volatiles (EPA 8260b)	5 Oxygenates (EPA 8260b)	7 Oxygenates (EPA 8260b)	MTBE (EPA 8260b)	Lead scavengers (8260b)	BTEX (8260b)		Comments
4-19-05		E-20-65			X					X		X		P07753-001
4-19-05		B-6-65			X					X		X		-002
4-20-05		I-6-65			X					X		X		-003
4-21-05		J-8-65			X					X		X		-004

Turnaround Time Requested: 24 Hour ____ 48 Hour ____ 5-Day ____ Standard X

Relinquished By: Mary Jane Ellis McNaboe	Date: 4-21-05	Relinquished By:	Date:
Received By: R Thurson	Date: 4/21/05	Received By:	Date:

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Laboratory Report

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project Name: **Mardikian**

Matrix: Soil
Sampled by: J. McNaboe/T. Schweizer

TESTS: TPH Gas by EPA 8015M

TPH g Analysis: 4/22/2005
Date of Report: 4/25/2005
Units: mg/Kg

Sample #: Date Sampled: Sample Description:	7753-001 4/19/2005 E-20-65	7753-002 4/19/2005 B-6-65	7753-003 4/20/2005 I-6-65	7753-004 4/21/2005 I-8-65	**DLmg/Kg**
TPH Gasoline	ND*	ND*	.73*	.53*	0.30
Surrogate Recovery %	98	91	95	96	

DL = Detection Limit
ND - Non-Detect at given DL
*TPHG result does not include MTBE

Analyst: Alexander Candia

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ProVera
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Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian**
Analysis Type: **EPA Method 8260B**
Analysis Date **4/22/2005**
Report Date : **4/25/2005**
Sample ID : **7753-001 E-20-65**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	0.38	mg/Kg	0.05	1
BTEX Components				
Benzene	ND	mg/Kg	0.05	1
Toluene	ND	mg/Kg	0.05	1
Ethylbenzene	ND	mg/Kg	0.05	1
m, p & o Xylenes	ND	mg/Kg	0.05	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	48	96%
1,2-Dichloroethane-d4	51	101%
Toluene-d8	46	92%
p-Bromofluorobenzene (BFB)	54	108%

Principal Analyst: Alexander Candia

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Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian**
Analysis Type: **EPA Method 8260B**
Analysis Date **4/22/2005**
Report Date : **4/25/2005**
Sample ID : **7753-002 B-6-65**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	0.15	mg/Kg	0.05	1
BTEX Components				
Benzene	ND	mg/Kg	0.05	1
Toluene	ND	mg/Kg	0.05	1
Ethylbenzene	ND	mg/Kg	0.05	1
m, p & o Xylenes	ND	mg/Kg	0.05	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	47	94%
1,2-Dichloroethane-d4	38	75%
Toluene-d8	46	92%
p-Bromofluorobenzene (BFB)	51	103%

Principal Analyst: Alexander Candia

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ProVera
Analytical Laboratories, Inc.

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian**
Analysis Type: **EPA Method 8260B**
Analysis Date **4/22/2005**
Report Date : **4/25/2005**
Sample ID : **7753-003 I-6-65**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	0.51	mg/Kg	0.05	1
BTEX Components				
Benzene	ND	mg/Kg	0.05	1
Toluene	ND	mg/Kg	0.05	1
Ethylbenzene	ND	mg/Kg	0.05	1
m, p & o Xylenes	ND	mg/Kg	0.05	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	48	95%
1,2-Dichloroethane-d4	42	84%
Toluene-d8	46	92%
p-Bromofluorobenzene (BFB)	50	99%

Principal Analyst: Alexander Candia

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ProVera
Analytical Laboratories, Inc.

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian**
Analysis Type: **EPA Method 8260B**
Analysis Date **4/22/2005**
Report Date : **4/25/2005**
Sample ID : **7753-004 I-8-65**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	0.58	mg/Kg	0.05	1
BTEX Components				
Benzene	ND	mg/Kg	0.05	1
Toluene	ND	mg/Kg	0.05	1
Ethylbenzene	ND	mg/Kg	0.05	1
m, p & o Xylenes	ND	mg/Kg	0.05	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	47	94%
1,2-Dichloroethane-d4	52	104%
Toluene-d8	45	90%
p-Bromofluorobenzene (BFB)	54	107%

Principal Analyst: Alexander Candia

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ProVera
Analytical Laboratories, Inc.

EPA 8260B QA-QC Report
EPA 8015M QA-QC Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Projects Covered by this QA-QC: **Mardikian**
Analysis Date: **4/22/2005**
Matrix: **Soil**

BFB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	42	84%
1,2-Dichloroethane-d4	44	88%
Toluene-d8	46	92%
p-Bromofluorobenzene (BFB)	47	94%

IB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	51	102%
1,2-Dichloroethane-d4	52	104%
Toluene-d8	48	96%
p-Bromofluorobenzene (BFB)	49	98%

MS:	**Results**	**% Recovery**
1,1-Dichloroethene	45	90%
Trichloroethene	46	92%
Chlorobenzene	46	92%
Toluene	45	90%
Benzene	47	94%
p-Bromofluorobenzene (BFB)	51	102%

MSD:	**Results**	**% Recovery**
1,1-Dichloroethene	47	94%
Trichloroethene	49	98%
Chlorobenzene	52	104%
Toluene	51	102%
Benzene	45	90%
p-Bromofluorobenzene (BFB)	50	100%

8015M-TPHG

	%Recovery
BFB	97%
IB	97%
MS	91%
MSD	94%

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PROVERA ANALYTICAL LABORATORIES

Chain of Custody Form

Client Name: RAM ENVIRONMENTAL

Project Name: Mardikian

Client Address:

Project Manager: R. Casagrande

Sampler Name: T. Schweizer

Sample Matrix: [ ] Aqueous [X] Soil [ ] Acidified

Sample Date	Sample Time	Sample Description and Container Type	BTEX (EPA 8021b)	MTBE (EPA 8021b)	TPH Gasoline (8015M)	TPH Diesel (8015M)	Volatiles (EPA 8260b)	5 Oxygenates (EPA 8260b)	7 Oxygenates (EPA 8260b)	MTBE (EPA 8260b)	Lead scavengers (8260b)	BTEX (8260b)		Comments
4-21-05	1610	E-4-60, steel tube			X					X		X		P07754-001

Turnaround Time Requested: 24 Hour ____ 48 Hour ____ 5-Day ____ Standard X

Relinquished By: [signature]	Date: 4-22-05	Relinquished By:	Date:
Received By: [signature]	Date: 4/22/05	Received By:	Date:

ProVera
Analytical Laboratories, Inc.

Laboratory Report

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project Name: **Mardikian**

Matrix: Soil
Sampled by: T. Schweizer

TESTS: TPH Gas by EPA 8015M

TPH g Analysis: 4/25/2005
Date of Report: 4/26/2005
Units: mg/Kg

Sample #: Date Sampled: Sample Description:	7754-001 4/21/2005 E-4-60	**DLmg/Kg**
TPH Gasoline	ND*	0.30
Surrogate Recovery %	95	

DL = Detection Limit
ND - Non-Detect at given DL
*TPH/G result does not include MTBE

Analyst: Alexander Candia

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Phone:(661) 827-5240 Fax: (661)827-5244

ProVera
Analytical Laboratories, Inc.

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian**
Analysis Type: **EPA Method 8260B**
Analysis Date **4/25/2005**
Report Date : **4/26/2005**
Sample ID : **7754-001 E-4-60**

Analyte	**Result**	**Units**	**Method RL**	**Method RL Multiplication Factor**
Methyl Tert-Butyl Ether (MTBE)	0.11	mg/Kg	0.05	1
BTEX Components				
Benzene	ND	mg/Kg	0.05	1
Toluene	ND	mg/Kg	0.05	1
Ethylbenzene	ND	mg/Kg	0.05	1
m, p & o Xylenes	ND	mg/Kg	0.05	1

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	47	94%
1,2-Dichloroethane-d4	41	82%
Toluene-d8	46	92%
p-Bromofluorobenzene (BFB)	51	102%

Principal Analyst: Alexander Candia

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Phone:(661) 827-5240 Fax: (661)827-5244

ProVera
Analytical Laboratories, Inc.

EPA 8260B QA-QC Report
EPA 8015M QA-QC Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Projects Covered by this QA-QC: **Mardikian**
Analysis Date: **4/25/2005**
Matrix: **Soil**

BFB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	53	106%
1,2-Dichloroethane-d4	54	108%
Toluene-d8	57	114%
p-Bromofluorobenzene (BFB)	48	96%

IB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	54	108%
1,2-Dichloroethane-d4	56	112%
Toluene-d8	58	116%
p-Bromofluorobenzene (BFB)	49	98%

MS:	**Results**	**% Recovery**
1,1-Dichloroethene	42	84%
Trichloroethene	41	82%
Chlorobenzene	46	92%
Toluene	49	98%
Benzene	49	98%
p-Bromofluorobenzene (BFB)	53	106%

MSD:	**Results**	**% Recovery**
1,1-Dichloroethene	47	94%
Trichloroethene	48	96%
Chlorobenzene	51	102%
Toluene	50	100%
Benzene	53	106%
p-Bromofluorobenzene (BFB)	54	108%

8015M-TPHG

	%Recovery
BFB	98%
IB	98%
MS	90%
MSD	98%

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APPENDIX D

LABORATORY RESUTLS - GROUNDWATER

PROVERA ANALYTICAL LABORATORIES

Chain of Custody Form

Pr. # 200102

Client Name: RAM Environmental Eng.

Project Name: Mardikian Water Samples

Client Address: 2103 20th street, Bakersfield

Project Manager: Richard Casagrande

Sampler Name: Tim Schweizer

Sample Date	Sample Time	Sample Description and Container Type	BTEX (EPA 8021b)	MTBE (EPA 8021b)	TPH Gasoline (8015M)	TPH Diesel (8015M)	Volatiles (EPA 8260b)	5 Oxygenates (EPA 8260b)	7 Oxygenates (EPA 8260b)	MTBE (EPA 8260b)	Lead scavengers (8260b)	BTEX (8260b)		Sample Matrix: Aqueous / Soil / Acidified	Comments
4/18/05	1012	mw2-A			X								7750-001		groundwater
4/18/05	1012	mw2-B								X		X	-001		
4/18/05	1215	mw3-A			X								-002		
4/18/05	1215	mw3-B								X		X	-002		
4/18/05	1413	mw4-A			X								-003		
4/18/05	1413	mw4-B								X		X	-003		

Turnaround Time Requested: 24 Hour ____ 48 Hour ____ 5-Day ____ Standard X

Relinquished By: [signature] Date: 4-19-05

Received By: [signature] Date: 4-19-05

Relinquished By: Date:

Received By: Date:

ProVera
Analytical Laboratories, Inc.

Laboratory Report

Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

TESTS: TPH Gas by EPA 8015M

Project Name: **Mardikian Water Samples**
#200102

Matrix: AQ
Sampled by: T. Schweizer

TPH g Analysis: 4/22/2005
Date of Report: 4/25/2005
Units: ug/l

Sample #: Date Sampled: Sample Description:	7750-001 4/18/2005 MW-2A	7750-002 4/18/2005 MW-3A	7750-003 4/18/2005 MW-4A	**DL ug/l**
TPH Gasoline	ND	ND*	ND	50
Surrogate Recovery %	93	93	91	

DL = Detection Limit
ND - Non-Detect at given DL
*TPHG result does not include MTBE

Analyst: Alexander Candia

5221 Woodmere Drive, Bakersfield, CA 93313
Phone:(661) 827-5240 Fax: (661)827-5244

ProVera
Analytical Laboratories, Inc.

Laboratory Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian Water Samples (#200102)**
Analysis: **EPA Method 8260b**
Analysis Date: **4/22/2005**
Report Date : **4/25/2005**
Sample ID : **7750-001 MW-2B**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	ND	ug/L	0.5	1
BTEX Components				
Benzene	ND	ug/L	0.5	1
Toluene	ND	ug/L	0.5	1
Ethylbenzene	ND	ug/L	0.5	1
m, p & o Xylenes	ND	ug/L	0.5	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	49	98%
1,2-Dichloroethane-d4	43	85%
Toluene-d8	47	94%
p-Bromofluorobenzene (BFB)	53	105%

Principal Analyst: Alexander Candia

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Phone:(661) 827-5240 Fax: (661)827-5244

ProVera
Analytical Laboratories, Inc.

Laboratory Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian Water Samples (#200102)**
Analysis: **EPA Method 8260b**
Analysis Date: **4/22/2005**
Report Date : **4/25/2005**
Sample ID : **7750-002 MW-3B**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	48	ug/L	0.5	1
BTEX Components				
Benzene	ND	ug/L	0.5	1
Toluene	ND	ug/L	0.5	1
Ethylbenzene	ND	ug/L	0.5	1
m, p & o Xylenes	ND	ug/L	0.5	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	47	93%
1,2-Dichloroethane-d4	47	94%
Toluene-d8	47	94%
p-Bromofluorobenzene (BFB)	53	105%

Principal Analyst: Alexander Candia

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ProVera
Analytical Laboratories, Inc.

Laboratory Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian Water Samples (#200102)**
Analysis: **EPA Method 8260b**
Analysis Date: **4/22/2005**
Report Date : **4/25/2005**
Sample ID : **7750-003 MW-4B**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	ND	ug/L	0.5	1
BTEX Components				
Benzene	ND	ug/L	0.5	1
Toluene	ND	ug/L	0.5	1
Ethylbenzene	ND	ug/L	0.5	1
m, p & o Xylenes	ND	ug/L	0.5	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	51	102%
1,2-Dichloroethane-d4	48	96%
Toluene-d8	47	94%
p-Bromofluorobenzene (BFB)	54	108%

Principal Analyst: Alexander Candia

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ProVera
Analytical Laboratories, Inc.

EPA 8260B QA-QC Report
EPA 8015M QA-QC Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Projects Covered by this QA-QC: **Mardikian**
Analysis Date: **4/22/2005**
Matrix: **AQ**

BFB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	42	84%
1,2-Dichloroethane-d4	44	88%
Toluene-d8	46	92%
p-Bromofluorobenzene (BFB)	47	94%

IB:

Internal Standards	**Results**	**% Recovery**
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	51	102%
1,2-Dichloroethane-d4	52	104%
Toluene-d8	48	96%
p-Bromofluorobenzene (BFB)	49	98%

MS:	**Results**	**% Recovery**
1,1-Dichloroethene	45	90%
Trichloroethene	46	92%
Chlorobenzene	46	92%
Toluene	45	90%
Benzene	47	94%
p-Bromofluorobenzene (BFB)	51	102%

MSD:	**Results**	**% Recovery**
1,1-Dichloroethene	47	94%
Trichloroethene	49	98%
Chlorobenzene	52	104%
Toluene	51	102%
Benzene	45	90%
p-Bromofluorobenzene (BFB)	50	100%

8015M-TPHG

	%Recovery
BFB	97%
IB	97%
MS	91%
MSD	94%

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PROVERA ANALYTICAL LABORATORIES

Pr. # 200102

Chain of Custody Form

Client Name: RAM Environmental Eng.

Project Name: Mardikian

Client Address: 2103 20th Street Bakersfield CA, 93301

Project Manager: Richard Casagrande.

Sampler Name: Tim Schweizer

Sample Date	Sample Time	Sample Description and Container Type	BTEX (EPA 8021b)	MTBE (EPA 8021b)	TPH Gasoline (8015M)	TPH Diesel (8015M)	Volatiles (EPA 8260b)	5 Oxygenates (EPA 8260b)	7 Oxygenates (EPA 8260b)	MTBE (EPA 8260b)	Lead scavengers (8260b)	BTEX (8260b)		Sample Matrix: Aqueous / Soil / Acidified	Comments
5/4/05	1030	mw-2A			X								PO7792-001		groundwater
5/4/05	1030	mw-2B								X		X	-001		
5/4/05	1205	mw-3A			X								-002		
5/4/05	1205	mw-3B								X		X	-002		
5/4/05	1311	mw-4A			X								-003		
5/4/05	1311	mw-4B								X		X	-003		

Turnaround Time Requested: 24 Hour ✓ 48 Hour ____ 5-Day ____ Standard ____

Relinquished By: [signature]	Date: 5/4/05	Relinquished By:	Date:
Received By: [signature]	Date: 05/04/05	Received By:	Date:

ProVera
Analytical Laboratories, Inc.

Laboratory Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

TESTS: TPH Gas by EPA 8015M

Project Name: **Mardikian** (Pr. #200102)
Matrix: AQ
Sampled by: T. Schweizer

TPH g Analysis: 5/4/2005
Date of Report: 5/5/2005
Units: ug/l

Sample #: Date Sampled: Sample Description:	7792-001 5/4/2005 MW-2A	7792-002 5/4/2005 MW-3A	7792-003 5/4/2005 MW-4A	DL ug/l
TPH Gasoline	ND	ND*	ND	50
Surrogate Recovery %	95	93	90	

DL = Detection Limit
ND - Non-Detect at given DL
*TPH/G value does not include MTBE

Analyst: **Alexander Candia**

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ProVera
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Laboratory Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian (Pr. #200102)**
Analysis: **EPA Method 8260b**
Analysis Date: **5/4/2005**
Report Date : **5/5/2005**
Sample ID : **7792-001 MW-2B**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	ND	ug/L	0.5	1
BTEX Components				
Benzene	ND	ug/L	0.5	1
Toluene	ND	ug/L	0.5	1
Ethylbenzene	ND	ug/L	0.5	1
m, p & o Xylenes	ND	ug/L	0.5	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	50	99%
1,2-Dichloroethane-d4	49	98%
Toluene-d8	42	84%
p-Bromofluorobenzene (BFB)	48	96%

Principal Analyst: Alexander Candia

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ProVera
Analytical Laboratories, Inc.

Laboratory Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian (Pr. #200102)**
Analysis: **EPA Method 8260b**
Analysis Date: **5/4/2005**
Report Date : **5/5/2005**
Sample ID : **7792-002 MW-3B**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	44	ug/L	0.5	1
BTEX Components				
Benzene	ND	ug/L	0.5	1
Toluene	ND	ug/L	0.5	1
Ethylbenzene	ND	ug/L	0.5	1
m, p & o Xylenes	ND	ug/L	0.5	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%

Surrogate Standards		
Methane, dibromofluoro-	50	100%
1,2-Dichloroethane-d4	37	74%
Toluene-d8	45	89%
p-Bromofluorobenzene (BFB)	50	100%

Principal Analyst: Alexander Candia

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ProVera
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Laboratory Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Project ID : **Mardikian (Pr. #200102)**
Analysis: **EPA Method 8260b**
Analysis Date: **5/4/2005**
Report Date : **5/5/2005**
Sample ID : **7792-003 MW-4B**

Analyte	Result	Units	Method RL	Method RL Multiplication Factor
Methyl Tert-Butyl Ether (MTBE)	ND	ug/L	0.5	1
BTEX Components				
Benzene	ND	ug/L	0.5	1
Toluene	ND	ug/L	0.5	1
Ethylbenzene	ND	ug/L	0.5	1
m, p & o Xylenes	ND	ug/L	0.5	1

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	47	95%
1,2-Dichloroethane-d4	51	102%
Toluene-d8	44	88%
p-Bromofluorobenzene (BFB)	49	98%

Principal Analyst: Alexander Candia

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ProVera
Analytical Laboratories, Inc.

EPA 8260B QA-QC Report
EPA 8015M QA-QC Report
Certification # 1920

CLIENT: **Ram Environmental**
2103 20th Street
Bakersfield, CA 93301

Projects Covered by this QA-QC: **Meridian**
Analysis Date: **5/4/2005**
Matrix: **AQ**

BFB:

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	49	98%
1,2-Dichloroethane-d4	45	90%
Toluene-d8	52	104%
p-Bromofluorobenzene (BFB)	51	102%

IS:

Internal Standards	Results	% Recovery
Benzene, fluoro	50	100%
Benzene-d5, chloro-	50	100%
1,4-Dichlorobenzene-d4	50	100%
Surrogate Standards		
Methane, dibromofluoro-	44	87%
1,2-Dichloroethane-d4	50	100%
Toluene-d8	51	101%
p-Bromofluorobenzene (BFB)	47	94%

MS:	Results	% Recovery
1,1-Dichloroethene	46	92%
Trichloroethene	47	94%
Chlorobenzene	43	86%
Toluene	46	92%
Benzene	59	118%
p-Bromofluorobenzene (BFB)	49	97%

MSD:	Results	% Recovery
1,1-Dichloroethene	40	80%
Trichloroethene	42	85%
Chlorobenzene	47	94%
Toluene	48	96%
Benzene	64	128%
p-Bromofluorobenzene (BFB)	48	95%

8015M-TPHG

	%Recovery
BFB	99%
IS	89%
MS	89%
MSD	93%

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APPENDIX E

GROUNDWATER SAMPLE FIELD DATA SHEET

GROUNDWATER SAMPLE FIELD DATA SHEET

PROJECT # : 200102 WELL I.D. # : MW-2

CLIENT / STATION # : Marathon DATE : 4/18/05

CASING DIAMETER (inches) 2 3 4 5 6 7 8 OTHER :

(CIRCLE ONE)

GALLONS / LINEAR FOOT : 0.18 0.39 0.65 1.6 2.05 OTHER :

97.3	-	78.6	=	18.7	x	0.18	=	3.37	x	3	=	10.1	
TD		DTW		water column		gallons / ft.		1 casing volume		casing volume		calculated purge	actual purge

TIME (2400 Hr)	VOLUME (gallons)	pH (units)	E.C. (umhos / cm)	TEMPERATURE (°F / °C)	COLOR (visual)	TURBIDITY (NTU)
0903	3.5	6.79	0.54	68.7	Brown	
0941	7.0	6.88	0.49	70.8	"	
1012	10.1	6.98	0.47	70.4	"	

DATE PURGED : 4/18/05 START (time): 0840 END (time): 1012

DATE SAMPLED : Same. SAMPLE TIME (SAME AS SAMPLE BOTTLES): 1012

PURGING EQUIPMENT			
☐	Submersible Pump	Bailer (Teflon)	☒
☐	Vacuum Truck	Bailer (PVC)	☐
☐	Other:		

SAMPLING EQUIPMENT			
☐	Bladder Pump	Bailer (Teflon)	☒
☐	Bailer Disposable	Submersible Pump	☐
☐	Other		

WATER COLUMN : _____ x .80 = 80% RECHARGE: _____ (TD - 80% RECHARGE = _____) SAMPLE DEPTH: 78.6'

REMARKS: 78.65+ dtw after sample taken

COMPLETED BY: Jim Schweizer SIGNATURE: Jim Schweizer

(Print Name)

GROUNDWATER SAMPLE FIELD DATA SHEET

PROJECT # : 200102 WELL I.D. # : MW3

CLIENT / STATION # : Mardifian DATE : 4/18/05

CASING DIAMETER (inches) 2 3 4 5 6 7 8 OTHER :

(CIRCLE ONE)

GALLONS / LINEAR FOOT : 0.18 0.39 0.65 1.6 2.05 OTHER :

98.2 (TD) - 79.05 (DTW) = 19.15 (water column) x 0.18 (gallons / ft.) = 3.45 (1 casing volume) x 3 (casing volume) = 10.35 (calculated purge) _____ (actual purge)

TIME (2400 Hr)	VOLUME (gallons)	pH (units)	E. C. (umhos / cm)	TEMPERATURE (°F / °C)	COLOR (visual)	TURBIDITY (NTU)
1118	3.5	6.95	0.60	67.9	Brown	
1155	7.0	6.92	0.55	68.0	"	
1215	10.3	6.89	0.62	70.1	"	

DATE PURGED : 4/18/05 START (time): 1033 END (time): 1215

DATE SAMPLED : Same. SAMPLE TIME (SAME AS SAMPLE BOTTLES): 1215

PURGING EQUIPMENT

- [ ] Submersible Pump — Bailer (Teflon) [X]
- [ ] Vacuum Truck — Bailer (PVC) [ ]
- [ ] Other:

SAMPLING EQUIPMENT

- [ ] Bladder Pump — Bailer (Teflon) [X]
- [ ] Bailer Disposable — Submersible Pump [ ]
- [ ] Other

WATER COLUMN : _____ x .80 = 80% RECHARGE: _____ (TD - 80% RECHARGE = _____) SAMPLE DEPTH: 79.03'

REMARKS: dtw - 79.03' After sampling

COMPLETED BY: Tim Schweizer (Print Name) SIGNATURE: [signature]

GROUNDWATER SAMPLE FIELD DATA SHEET

PROJECT # : 200102 WELL I.D. # : MW-4

CLIENT / STATION # : Mardikian DATE : 4/18/05

CASING DIAMETER (inches) 2 3 4 5 6 7 8 OTHER :

(CIRCLE ONE)

GALLONS / LINEAR FOOT : 0.18 0.39 0.65 1.6 2.05 OTHER :

97.95 (TD) - 78.06 (DTW) = 19.89 (water column) x 0.18 (gallons / ft.) = 3.58 gal (1 casing volume) x 3 (casing volume) = 10.74 (calculated purge) ____ (actual purge)

TIME (2400 Hr)	VOLUME (gallons)	pH (units)	E. C. (umhos / cm)	TEMPERATURE (°F / °C)	COLOR (visual)	TURBIDITY (NTU)
1323	3.5	6.69	0.69	76.3	brown	
1345	3.5	6.94	0.58	71.6	brown	
1413	3.7	7.15	0.73	71.7	brown	

DATE PURGED : 4/18/05 START (time): 1252 END (time): 1413

DATE SAMPLED : Same SAMPLE TIME (SAME AS SAMPLE BOTTLES): 1415

PURGING EQUIPMENT			
☐	Submersible Pump	Bailer (Teflon)	☒
☐	Vacuum Truck	Bailer (PVC)	☐
☐	Other:		

SAMPLING EQUIPMENT			
☐	Bladder Pump	Bailer (Teflon)	☒
☐	Bailer Disposable	Submersible Pump	☐
☐	Other		

WATER COLUMN : _____ x .80 = 80% RECHARGE: _____ (TD - 80% RECHARGE = _____) SAMPLE DEPTH: 78.13'

REMARKS: dtw = 78.13' at time of sampling

COMPLETED BY: Tim Schweizer (Print Name) SIGNATURE: Tim Schweizer

GROUNDWATER SAMPLE FIELD DATA SHEET

PROJECT # : 25012

WELL I.D. # : MW-2

CLIENT / STATION # : Mardikian

DATE : 5/4/05

CASING DIAMETER (inches) 2 3 4 5 6 7 8 OTHER :

(CIRCLE ONE)

GALLONS / LINEAR FOOT : 0.18 0.39 0.65 1.6 2.05 OTHER :

84.7 (TD) - 78.7 (DTW) = 6.0 (water column) x 0.18 (gallons / ft.) = 1.08 (1 casing volume) x 3 (casing volume) = 3.24 (calculated purge) _____ (actual purge)

TIME (2400 Hr)	VOLUME (gallons)	pH (units)	E. C. (umhos / cm)	TEMPERATURE (°F / °C)	COLOR (visual)	TURBIDITY (NTU)
1013	1.1	6.92	0.56	73.0	cloudy brown	
1020	2.2	6.80	0.51	69.3	"	
1030	3.3	6.85	0.57	67.3	"	

DATE PURGED : 5/4/05 START (time): 1000 END (time): 1030

DATE SAMPLED : 5/4/05 SAMPLE TIME (SAME AS SAMPLE BOTTLES): (SAME)

PURGING EQUIPMENT			
☐	Submersible Pump	Bailer (Teflon)	☑
☐	Vacuum Truck	Bailer (PVC)	☐
☐	Other:		

SAMPLING EQUIPMENT			
☐	Bladder Pump	Bailer (Teflon)	☑
☐	Bailer Disposable	Submersible Pump	☐
☐	Other		

WATER COLUMN : _____ x .80 = 80% RECHARGE: _____ (TD - 80% RECHARGE = _____) SAMPLE DEPTH: _____

REMARKS: DTW after sampling - 78.6'

COMPLETED BY: Tim Schweizer (Print Name) SIGNATURE: [signature]

GROUNDWATER SAMPLE FIELD DATA SHEET

PROJECT # : 200102 WELL I.D. # : MW-3

CLIENT / STATION # : Mardikian DATE : 5/4/05

CASING DIAMETER (inches) 2 3 4 5 6 7 8 OTHER :
(CIRCLE ONE)

GALLONS / LINEAR FOOT : 0.18 0.39 0.65 1.6 2.05 OTHER :

88.9	-	79.13	=	9.77	x	0.18	=	1.76	x	3	=	5.28	
TD		DTW		water column		gallons / ft.		1 casing volume		casing volume		calculated purge	actual purge

TIME (2400 Hr)	VOLUME (gallons)	pH (units)	E. C. (umhos / cm)	TEMPERATURE (°F / °C)	COLOR (visual)	TURBIDITY (NTU)
1114	1.7	6.82	0.74	73.4	cloudy brown	
1141	3.4	6.75	0.68	72.1	"	
1203	5.2	7.11	0.66	71.7	"	

DATE PURGED : 5/4/05 START (time): 1058 END (time): 1205

DATE SAMPLED : 5/4/05 SAMPLE TIME (SAME AS SAMPLE BOTTLES): 1205

PURGING EQUIPMENT			
☐	Submersible Pump	Bailer (Teflon)	☒
☐	Vacuum Truck	Bailer (PVC)	☐
☐	Other:		

SAMPLING EQUIPMENT			
☐	Bladder Pump	Bailer (Teflon)	☒
☐	Bailer Disposable	Submersible Pump	☐
☐	Other		

WATER COLUMN : _____ x .80 = 80% RECHARGE: _____ (TD - 80% RECHARGE = _____) SAMPLE DEPTH: _____

REMARKS: changed bailing tubes 1/2 way through. Failed to hold. DTW after sampling 79.08'

COMPLETED BY: Tim Schweizer (Print Name) SIGNATURE: [signature]

GROUNDWATER SAMPLE FIELD DATA SHEET

PROJECT # : 200102 WELL I.D. # : MW-4

CLIENT / STATION # : Mardikian DATE : 5/4/05

CASING DIAMETER (inches) 2 3 4 5 6 7 8 OTHER :

(CIRCLE ONE)

GALLONS / LINEAR FOOT : 0.18 0.39 0.65 1.6 2.05 OTHER :

89.0	-	78.13	=	10.87	x	0.18	=	1.96	x	3	=	5.88	
TD		DTW		water column		gallons / ft.		1 casing volume		casing volume		calculated purge	actual purge

TIME (2400 Hr)	VOLUME (gallons)	pH (units)	E. C. (umhos / cm)	TEMPERATURE (°F / °C)	COLOR (visual)	TURBIDITY (NTU)
1245	1.9	6.96	0.71	75.3	Brown (cloudy)	
1257	3.8	6.99	0.67	72.1	"	"
1311	5.8	7.12	0.66	72.2	"	"

DATE PURGED : 5/4/05 START (time): 1231 END (time): 1311

DATE SAMPLED : 5/4/05 SAMPLE TIME (SAME AS SAMPLE BOTTLES): 1311

PURGING EQUIPMENT			
☐	Submersible Pump	Bailer (Teflon)	☑
☐	Vacuum Truck	Bailer (PVC)	☐
☐	Other:		

SAMPLING EQUIPMENT			
☐	Bladder Pump	Bailer (Teflon)	☑
☐	Bailer Disposable	Submersible Pump	☐
☐	Other		

WATER COLUMN : _____ x .80 = 80% RECHARGE: _____ (TD - 80% RECHARGE = _____) SAMPLE DEPTH: _____

REMARKS: DTW after sampling - 78.1'

COMPLETED BY: Tim Schweizer (Print Name) SIGNATURE: Tim Schweizer