MALCOLM PIRNIE

SITE INVESTIGATION REPORT

Prepared for:

MORGAN MATERIALS, INC.
HERTEL AVENUE FACILITY
BUFFALO, NEW YORK

December 2001

Submitted by:
Malcolm Pirnie, Inc.
40 Centre Drive
Orchard Park, NY 14127

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Project Background

SECTION 1

Morgan Materials, Inc. (Morgan Materials) is a broker of off-specification and discontinued chemicals that are purchased for the purpose of resale. In March 1997, the New York State Department of Environmental Conservation (NYSDEC) requested that the U.S. Environmental Protection Agency (USEPA) evaluate Morgan Material's facility at 373 Hertel Avenue for a removal action. The site location is shown on Figure 1. Following the site evaluation, the USEPA removed approximately 20,000 drums of waste material from the Hertel Avenue facility. Based on the detection of tetrachloroethene (PCE) in a soil sample, the NYSDEC requested on March 22, 2000 that Morgan Materials undertake an investigation and possible cleanup of the site.

1.1 Previous Investigations

As part of a site-wide investigation conducted in 1998, Roy F. Weston, Inc. (Weston), as contractor for the USEPA, drilled and sampled 17 soil borings (GP-1 through GP-7) and drilled and installed five overburden groundwater monitoring wells (MW-1 through MW-5) throughout the site. A soil sample collected from boring GP-12, located near a loading dock located in the south side of the facility, contained PCE at a concentration above the NYSDEC soil cleanup objective.

Weston also collected groundwater samples from four of the five wells (monitoring well MW-5 did not produce enough water to sample) and the samples were analyzed for full TCL/TAL analytes. Groundwater collected from the two wells completed in the deeper saturated clay (MW-1 and MW-2), did not contain VOCs. Groundwater collected from the two wells completed in the sand and gravel fill materials (MW-3 and MW-4) contained VOCs at concentrations above NYSDEC groundwater quality standards. Most

FIGURE 1

MORGAN MATERIALS Inc.
373 HERTEL AVENUE
BUFFALO, NY 14207

notably, PCE and its breakdown products trichloroethene (TCE), cis-1,2-dichloroethene (DCE), and vinyl chloride were present in the samples.

In 2000, Waste Resource Associates conducted an investigation that focused on the loading dock area. The investigation consisted of a soil vapor study, soil sampling, and groundwater sampling. PCE was detected in the soil at concentrations above the NYSDEC Soil Cleanup Objectives. PCE, TCE, and vinyl chloride were detected in groundwater samples collected from MW-3 and MW-4 at concentrations above the groundwater quality standards. The results of the investigations were summarized in an October 19, 2000 report.

1.2 Site Geology and Hydrogeology

The five monitoring wells installed by Weston were constructed with the intent to screen the first water-bearing zone encountered. Depths of the monitoring wells ranged from 13 to 38 feet below ground surface, and the wells were screened in one of two types of overburden. Two of the five wells (MW-3 and MW-4) were completed in sand and gravel fill at 20 and 28 feet below grade, respectively. Where encountered, this layer was the uppermost overburden layer and ranged in thickness from 10 to 24 feet. A dry, red silty clay layer was observed beneath the sand and gravel fill. Malcolm Pirnie also installed two wells (MW-6 and MW-7) in the sand and gravel in 2001. The other three wells (MW-1, MW-2, and MW-5) installed by Weston were constructed in red-brown silty clay that was present from ground surface to their total depth. These wells encountered water within the silty clay at depths of up to 34 feet below grade at which point they were screened.

Based on observations made during the 1998 investigation, Weston reported that perched water table conditions exist in the sand and gravel materials screened in MW-3 and MW-4. Observations made during Malcolm Pirnie's investigation indicate that the sand and gravel layer thickens toward the southeast. Based on this information, it is more likely that the sand and gravel materials constitute a layer above the native silty clay, and this layer pinches out to the northwest in the areas of MW-1, MW-2, and MW-5.

The water level measurements are summarized in Table 1, and the groundwater contours are shown on Figure 2. Based on water levels measured on September 21, 2001, groundwater flows toward the south and southeast.

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TABLE 1

MORGAN MATERIALS
HERTEL AVENUE SITE

SEPTEMBER 21, 2001 GROUNDWATER ELEVATIONS

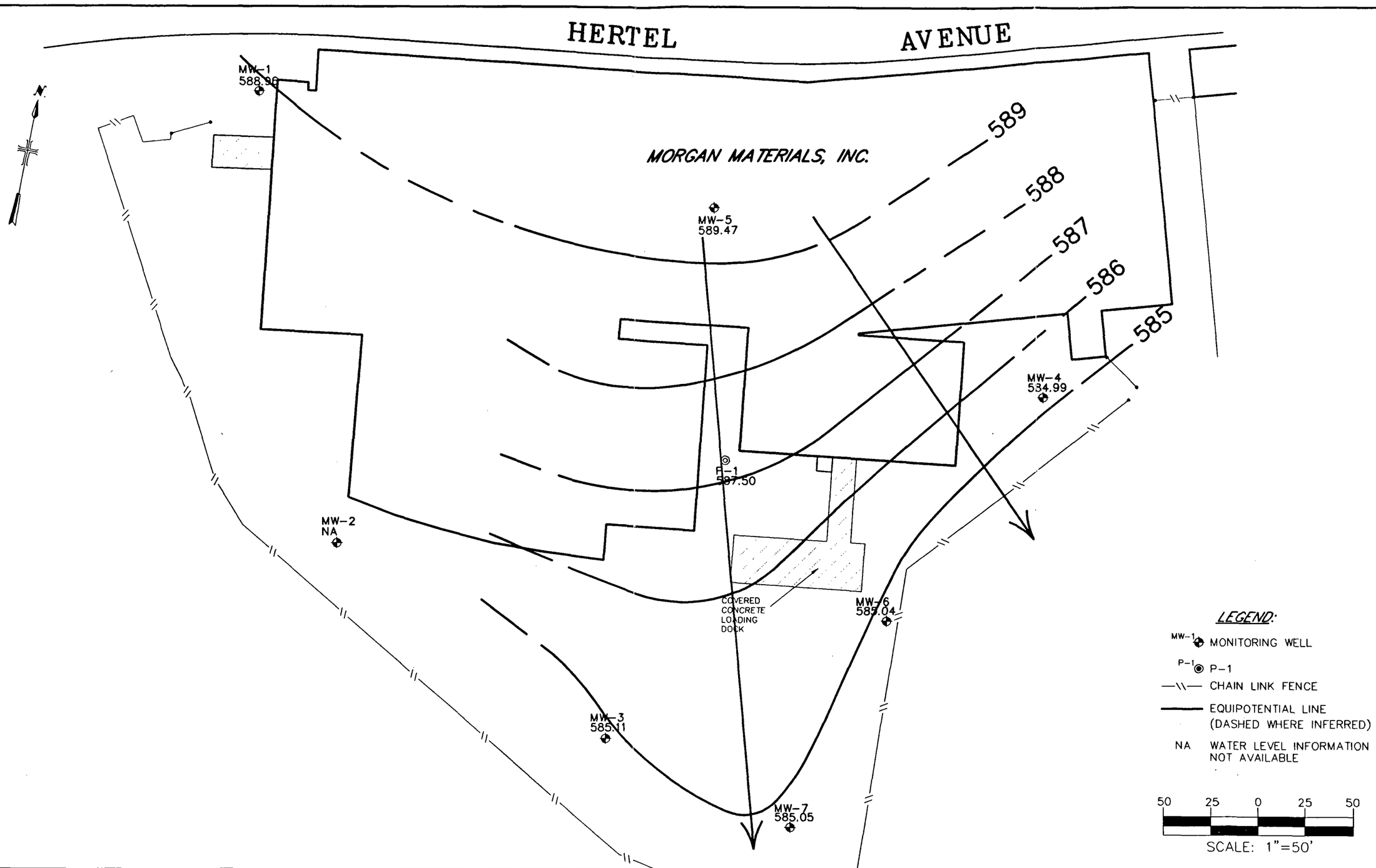
Location	Riser Elevation[1]	Depth to Water[2]	Groundwater Elevation[1]
MW-1	591.98	3.02	588.96
MW-2	592.29	NA	NA
MW-3	592.27	7.16	585.11
MW-4	596.43	11.44	584.99
MW-5	594.24	4.77	589.47
MW-6	593.92	8.88	585.04
MW-7	592.79	7.74	585.05
DVE-P4	597.18	9.68	587.50

Notes:

(1) Measured in feet above mean sea level.

(2) Measured in feet below top of riser.

NA Measurement not available due to rising water level after removal of well cap.



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07/01 4228G004

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373 HERTEL AVE. BUFFALO, NEW YORK

GROUNDWATER INVESTIGATION

FIGURE 2

GROUNDWATER CONTOURS

SEPTEMBER 21, 2001

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Investigation Approach and Results

SECTION 2

2.1 Supplemental Soil Investigation

In April 2001, Malcolm Pirnie performed a focused site investigation of the area of interest (the small grassy area between the main building and the loading dock). A direct push drilling rig was used to drill nine soil borings in a cross pattern within the area of interest. The soil boring logs are included in Attachment A. The soil investigation combined in-field soil screening with focused confirmatory analyses. Soil samples were collected and analyzed for VOCs to further define the degree and extent of PCE contamination in the soil above the water table. The results of this investigation indicated that the overburden consisted of sand and gravel with traces of fill material (slag). The water table, at the time of the investigation, was between 6 and 10 feet below grade.

The analytical results are summarized in Table 2 and Figures 3 and 4 show the concentration distribution at two depth intervals (zero to four and four to eight feet below grade). PCE concentrations in soil were highest in the center of the area of interest and generally decreased with distance from the center point. PCE concentrations were also generally higher at depths of zero to four feet below grade than those at four to eight feet below grade) PCE concentrations were below the NYSDEC soil cleanup objective at the northern and southern extents of the area of interest.

2.2 Groundwater Investigation

To further characterize the nature and extent of fill material as well as groundwater conditions at the site, Malcolm Pirnie evaluated the condition of the five existing monitoring wells (MW-1 through MW-5), installed and developed two new monitoring

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TABLE 2
MORGAN MATERIALS, INC.
SUMMARY OF SOIL BORING ANALYTICAL RESULTS

Parameter	GEOPROBE LOCATIONS																			NYSDEC TAGM 4046
	GPC-0 S-1	GPC-0 S-2	GPC-0 S-4	GPN-20 S-1	GPN-20 S-2	GPN-35 S-1	GPN-35 S-2	BLIND DUP[1]	GPE-20 S-1	GPE-20 S-2	GPE-45 S-1	GPE-45 S-2	GPS-15 S-1	GPS-15 S-2	GPS-30 S-1	GPW-7 S-1	GPW-7 S-2	GPW-15 S-1	GPW-15 S-2	TRIP BLANK	
	(0'-2')	(2'-4')	(6'-8')	(0'-4')	(4'-8')	(0'-4')	(4'-8')		(0'-4')	(4'-8')	(0'-4')	(4'-8')	(0'-4')	(4'-8')	(0'-4')	(0'-4')	(4'-8')	(0'-4')	(4'-8')		
VOLATILE ORGANICS (mg/kg)																					
Tetrachloroethene	88	34	5.8	0.089	0.28	0.064	0.081	0.098	22	4.5	43	22	13	5.4	0.024	16	5.7	17	1.9		1.4
Acetone			4.6 B						4.4 B	3.5 B	4.3 B	3.7 B	4.4 B	4.1 B		3.5 B	5.6 B	3.3 B	4.7 B		0.2
Bromomethane				0.006 B																	NA

Notes:

[1] Blind Duplicate of GPN-35 S-2.

B - Analyte was detected in method or trip blank.

NA - NYSDEC TAGM 4046 Soil Cleanup Objective not available.

Blank space indicates analyte not detected.

All shaded values indicate an exceedance of the NYSDEC TAGM 4046 Soil Cleanup Objective.

Samples collected on April 3, 2001.

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BY B.W. DATE 5/4/01 SHEET NO. 1 OF 2

CHKD. BY ..... DATE ..... JOB NO. 42ZE00!

SUBJECT Morgan Materials Site Sketch

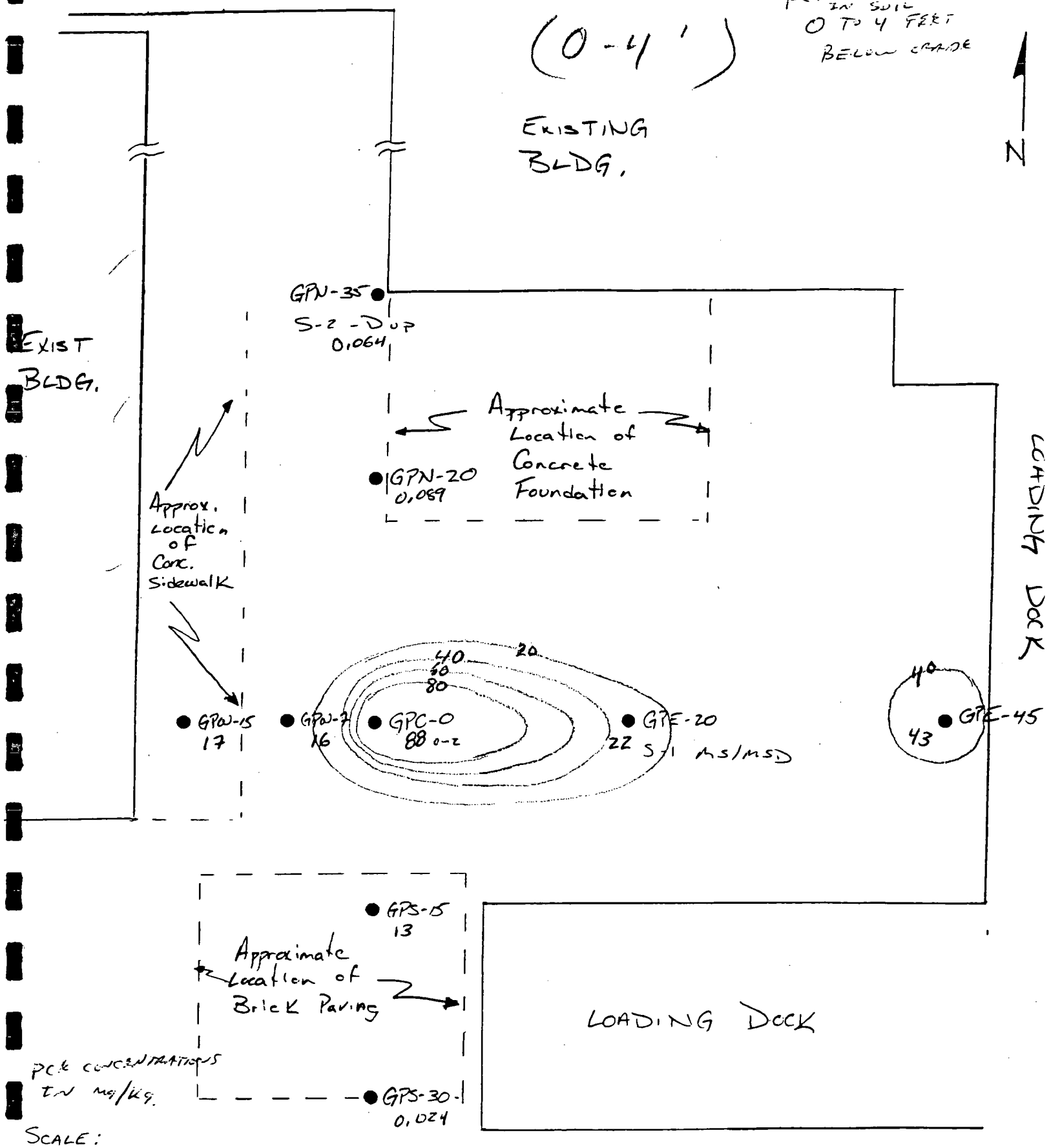

FIGURE 3

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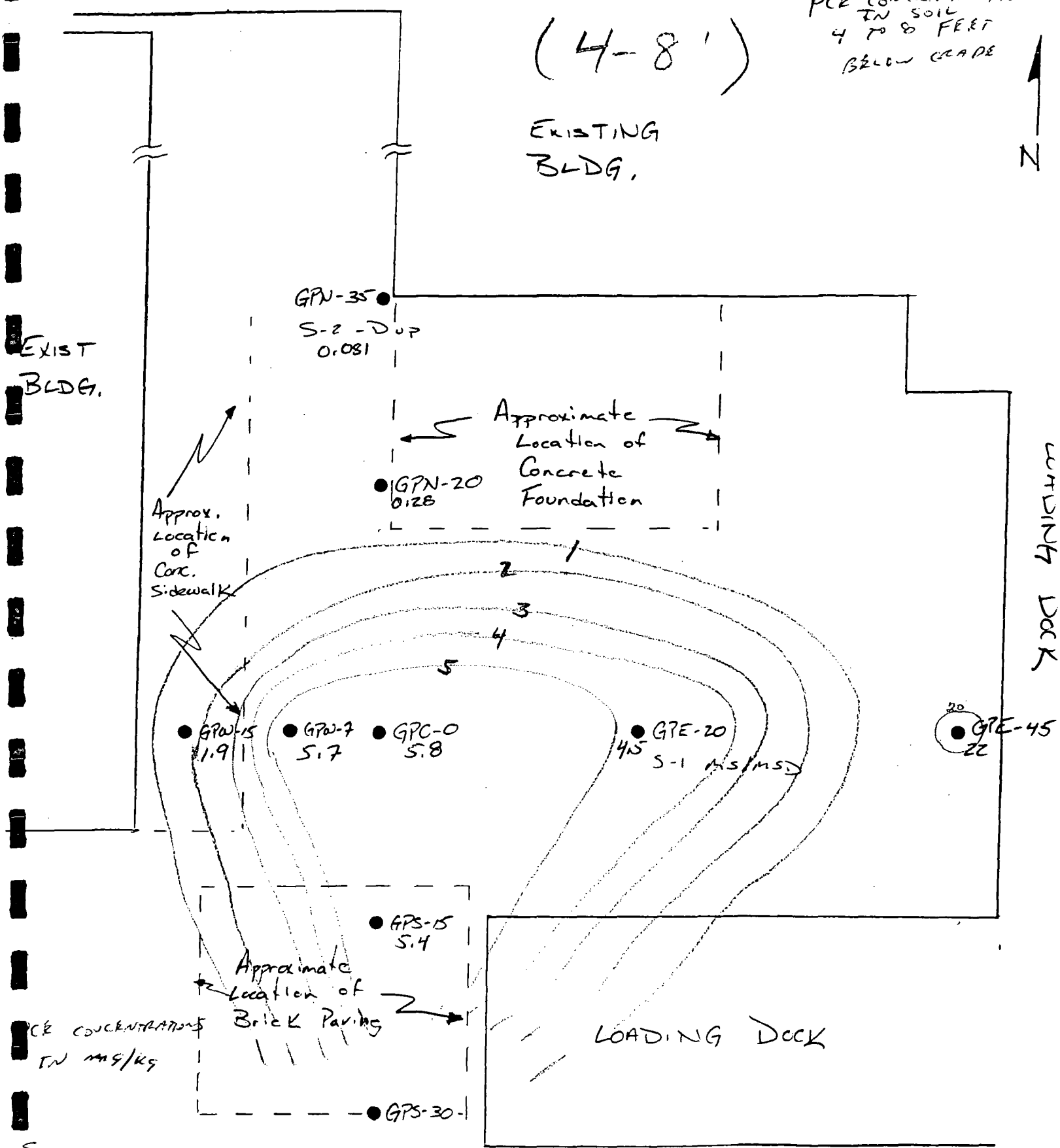
BY B.W DATE 5/14/01 SHEET NO. 2 OF 2

CHKD. BY ..... DATE ..... JOB NO. 42ZE00.1

SUBJECT Morgan Materials Site Sketch



SCALE:
1" = 10'

FIGURE 4

wells (MW-6 and MW-7), installed one piezometer, and sampled the seven monitoring wells. The boring and well construction logs for the monitoring wells are included in Attachment A.

The assessment of the existing wells indicated that the condition of each was acceptable for sampling. VOCs were detected in MW-3, MW-4, MW-6, and MW-7 at concentrations above the groundwater standards. The contaminants detected include PCE, TCE, DCE, and vinyl chloride. The results are summarized in Table 3, and Figure 5 shows the distribution of groundwater contaminants in terms of total VOCs across the site. The figure indicates that the highest concentrations were detected to the southeast, or downgradient, of the presumed source area (the loading dock area).

2.3 Map Preparation

A site map was prepared to plot and evaluate the information gained during the investigation. Following drilling of the soil borings and monitoring wells, a New York State-licensed surveyor measured and mapped site features including the boring and well locations, building corners, and the perimeter fence. The survey of the wells included both horizontal and vertical measurements. The resulting map was used to produce the figures in this report.

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TABLE 3
MORGAN MATERIALS
HERTEL AVENUE SITE

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

PARAMETER	SAMPLE LOCATION							NYSDEC GW STANDARD
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	
VOLATILE ORGANICS (µg/L)								
Acetone				29R				50(a)
cis-1,2-Dichloroethene			360	43		140	26000	5
Tetrachloroethene			100B			410	33000	5
Trichloroethene			280	7		39	5800	5
Vinyl Chloride			49	6			2400	2
Total VOCs			789	56		589	67200	

Notes:

Empty cells indicate that no VOCs were detected.

Shaded values exceed the NYSDEC Groundwater (GW) Standard.

(a)=Guidance value

B=Analyte was also detected in the trip blank.

R=Results are suspect due to high check sample recovery.

Samples collected on August 24 and 27, 2001

HERTEL AVENUE

MW-1
ND

MORGAN MATERIALS, INC.

MW-5
ND

ND

50

MW-4
50

P-1

MW-2
ND

COVERED CONCRETE LOADING DOCK

500

MW-6
589

5,000

MW-3
789

50,000

MW-7
67200

LEGEND:

MW-1 MONITORING WELL

P-1 P-1

CHAIN LINK FENCE

ISOCONCENTRATION LINE (DASHED WHERE INFERRED)

ND NON-DETECT

50 25 0 25 50

SCALE: 1"=50'

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07/01 4228G005

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GROUNDWATER INVESTIGATION

FIGURE 5
TOTAL VOC CONCENTRATIONS
SEPTEMBER 21, 2001

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ATTACHMENT A

FIELD LOGS

U.S EPA Environmental Response Team Center

Response Engineering and Analytical Contract

68-C4-0024

W.O. # 03347-143-001-3399-01

BOREHOLE LOG AND WELL CONSTRUCTION DIAGRAM

Site Name: Morgan Materials Site
Site Location: Buffalo, New York
Boring ID: MW-1

Total Depth: 35.0 ft
Logger: W. Avery
Date Started: 11/3/98
Date Completed: 11/3/98

All depths are in feet (ft) below ground surface.
Well completed with flush-mount casing and cement pad.

Depth	Material	USCS Classification	Comments	Depth to Water	Well Construction Summary	Well Completion Diagram
0		SW	0-2 (core): Dark gray gravelly sand, rounded, loose, dry, non-cemented.			
		MH	2-4 (core): Red-brown clayey silt, minor fine-grained sub-rounded gravel, moderate sorting, dry, low plasticity, soft, moderately calcareous.		Grout from 0 to 20.5 ft around inner casing.	
-5		CL	4.5-6 (core): Same as above.			
		CL	7.4-8 (core): Red-brown silty clay, minor fine-grained sub-rounded gravel, moderate sorting, dry, low plasticity, soft, moderately calcareous.			
		CL	8-10 (core): Same as above.			
-10		CL	11.6-12 (core): Red-brown clay, minor angular gravel, moderate sorting, dry, firm, low plasticity, moderately calcareous.		Inner casing is 2-inch schedule 40 PVC.	
		CL	12-14 (core): Same as above with minor silt.			
		CL	14-16 (core): Red-brown clay with minor fine-grained sub-rounded gravel, moderate sorting, dry, firm, moderate plasticity, moderately calcareous.			
-15		CL	16-18 (core): Red-brown silty clay with minor fine-grained sub-rounded gravel, well sorted, dry, firm, low plasticity, moderately calcareous.			
		CL	18-20 (core): Same as above with moderate plasticity.			
-20		CL	20-22 (core): Red-brown silty clay with minor fine-grained sub-rounded gravel, well sorted, dry, firm, gray clay vertical tracers, moderate plasticity, moderately calcareous.		Bentonite seal from 20.5 to 23 ft.	
		CL	22.2-24 (core): Same as above.			
		CH	24-26 (core): Red-brown silty clay with minor sub-rounded to angular gravel, moderate sorting, high plasticity, dry, soft, higher silt content, coarse gravel at bottom of spoon.		Sand pack from 23 to 35 ft.	
-25		CL	26-28 (core): Red-brown silty clay with sandy gravel pockets. Well sorted, dry, sft, moderate plasticity, moderately calcareous.	▼		
		CL	28-29.5 (core): Red-brown silty clay with minor sub-rounded fine-grained gravel, well sorted, dry, moderate plasticity, firm.			
-30		CH	29.5-30 (core): Gray-brown clay. Moist, well-sorted, highly plastic.		2-inch PVC, No. 10 slot screen from 25 to 35 ft.	
			30-32 (core): Same as above with gray clay tracers.			
		CH	32-34 (core): Same as above.			
-35						

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W.O. # 03347-143-001-3399-01

BOREHOLE LOG AND WELL CONSTRUCTION DIAGRAM

Site Name: Morgan Materials Site
Site Location: Buffalo, New York
Boring ID: MW-2

Total Depth: 38.0 ft
Logger: W. Avery
Date Started: 11/3/98
Date Completed: 11/3/98

All depths are in feet (ft) below ground surface.
Well completed with flush-mount casing and cement pad.

Depth	Material	USCS Classification	Comments	Depth to Water	Well Construction Summary	Well Completion Diagram
0		SW	0-2 (core): Mottled gray, tan, brown sand, angular, loose, dry, non-cemented.			
		SP	2-4 (core): Dark brown gravelly sand, minor fine-grained sub-angular gravel, poorly sorted, dry, low plasticity.		Grout from 0 to 23.2 ft around inner casing.	
-5		GP-GM	4-5 (core): Gray-black sub-angular gravel and sand, poorly sorted, dry, non-cemented.	▼		
		CL	7.5-8 (core): Red-brown silty clay, minor fine-grained sub-rounded gravel, well sorted, dry, low plasticity, soft, moderately calcareous.			
		CL	8-10 (core): Red-brown silty clay, minor rounded gravel, well sorted, dry, low plasticity, moderately calcareous.			
-10		CL	10-12 (core): Red-brown clay, minor angular gravel, well sorted, dry, firm, moderate plasticity, moderately calcareous, dolomite present.		Inner casing is 2-inch schedule 40 PVC.	
		CL	12-14 (core): Red-brown silty clay, minor fine-grained sub-angular gravel, well sorted, dry, very stiff, moderately calcareous.			
		CL	14-16 (core): Same as above.			
-15		CL	16-18 (core): Red-brown silty clay with minor fine-grained sub-angular gravel, well sorted, dry, very stiff, moderate plasticity, moderately calcareous.			
		CL	18-20 (core): Same as above with larger gravel fragments.			
-20		CL	20-22 (core): Red-brown silty clay with minor fine-grained sub-rounded gravel, well sorted, dry, very stiff, gray clay sub-vertical striations, moderate plasticity, moderately calcareous.			
		CL	22-24 (core): Same as above.			
-25		CL	24-26 (core): Red-brown silty clay with minor sub-rounded gravel, well sorted, moderate plasticity, dry, very stiff, moderately calcareous.		Bentonite seal from 23.2 to 26 ft.	
		CL	26-28 (core): Same as above with limestone fragments.		Sand pack from 26 to 38 ft.	
		CL	28-30 (core): Same as above.			
-30		CL	30-32 (core): Same as above.		2-inch PVC, No. 10 slot screen from 28 to 38 ft.	
		CH	32-34 (core): Red-grey clay, well sorted, moist, soft, high plasticity, slightly calcareous.			
-35						

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W.O. # 03347-143-001-3399-01

BOREHOLE LOG AND WELL CONSTRUCTION DIAGRAM

Site Name: Morgan Materials Site
Site Location: Buffalo, New York
Boring ID: MW-3

Total Depth: 20.0 ft
Logger: W. Avery
Date Started: 11/4/98
Date Completed: 11/4/98

All depths are in feet (ft) below ground surface.
Well completed with above ground, locking protective casing.

Depth	Material	USCS Classification	Comments	Depth to Water	Well Construction Summary	Well Completion Diagram
0					Grout from 0 to 4 ft around inner casing Inner casing is 2-inch schedule 40 PVC.	
-5		SP	4-6 (core): Black-gray sand, minor fine-grained sub-angular gravel, poorly sorted, moist, non-cemented.		Bentonite seal from 4 to 6 ft.	
				▼	Sand pack from 6 to 21 ft.	
-10		SP CL	10-11 (core): Red-brown clay, minor sub-angular gravel, moderate sorting, dry, firm, low plasticity, moderately calcareous.		2-inch PVC. No. 10 slot screen from 8 to 13 ft.	
-15		CL	14-16 (core): Same as above.			
-20		CL	19-21 (core): Red-brown clay, minor sub-angular gravel, well sorted, dry, firm, non-cemented, moderate plasticity, moderately calcareous.			

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W.O. # 03347-143-001-3399-01

BOREHOLE LOG AND WELL CONSTRUCTION DIAGRAM

Site Name: Morgan Materials Site
Site Location: Buffalo, New York
Boring ID: MW-4

Total Depth: 28.0 ft
Logger: W. Avery
Date Started: 11/4/98
Date Completed: 11/4/98

All depths are in feet (ft) below ground surface.
Well completed with above ground, locking protective casing.

Depth	Material	USCS Classification	Comments	Depth to Water	Well Construction Summary	Well Completion Diagram
0		SP	0-2 (core): Dark brown-red-tan medium-fine grained sand, minor fine-grained angular gravel, moderately sorted, dry, non-cemented.			
		SP	2-4 (core): Dark brown-tan angular sand, minor medium-fine grained sub-angular gravel, poorly sorted, dry, non-cemented.		Grout from 0 to 14 ft around inner casing.	
-5		SP	4-6 (core): Red-brown-gray medium sand with medium-fine grained sub-angular gravel, moderately sorted, dry, non-cemented.			
		SP	6-8 (core): Black-gray-tan fine-grained sub-angular sand, medium-fine grained angular gravel, moderately sorted, dry, non-cemented.			
		SP	8-10 (core): Red-black coarse angular fractured gravel, medium-fine grained sub-angular sand, poorly sorted, dry, red mudstone rock fragments in sand.			
-10		SP	10-12 (core): Red-black coarse angular sand, medium-fine grained angular fractured gravel, poorly sorted, moist with last foot wet.		Inner casing is 2-inch schedule 40 PVC.	
		GP	12-14 (core): Red-black medium-fine grained angular gravel, minor fine sub-angular sand, poorly sorted, wet-saturated, non-cemented.	▼		
-15		GP	14-16 (core): Dark gray-black medium-fine grained angular fractured gravel, minor coarse grained angular sand, poorly sorted, wet-saturated.		Bentonite seal from 14 to 16 ft.	
		GP	16-18 (core): Same as above.			
		SP	18-20 (core): Dark gray medium-fine grained angular sand, fine grained angular fractured gravel, poorly sorted, saturated.			
-20		GP	20-22 (core): Dark gray-tan fine grained sub-angular gravel, medium grained angular sand, poorly sorted, saturated.		Sand pack from 16 to 28 ft.	
		SP-SM	22-24 (core): Dark gray sandy gravel with tan gravel layer at 23.6-23.8, saturated, non-cemented			
-25		CL	24-26 (core): Gray-Red-brown silty clay possibly stained by water, moderate plasticity, moist, moderately calcareous.		2-inch PVC, No. 10 slot screen from 18 to 28 ft.	
		CL	26-28 (core): Red-brown silty clay, vertical gray striations, moderate plasticity, dry, moderately calcareous.			

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W.O. # 03347-143-001-3399-01

BOREHOLE LOG AND WELL CONSTRUCTION DIAGRAM

Site Name: Morgan Materials Site
Site Location: Buffalo, New York
Boring ID: MW-5

Total Depth: 37.0 ft
Logger: W. Avery
Date Started: 11/5/98
Date Completed: 11/5/98

All depths are in feet (ft) below ground surface.
Well completed with flush-mount casing and cement pad.

Depth	Material	USCS Classification	Comments	Depth to Water	Well Construction Summary	Well Completion Diagram
0		CL	0-2 (core): Top 1 inch is black to brown, dry, gravel fill. Rest of core is red-brown silty caly, low plasticity.			
		CL	2-4 (core): Red-brown silty clay.		Grout from 0 to 22.5 ft around inner casing.	
-5		CL	4-6 (core): Red-brown silty clay, minor fine-grained gravel, well sorted, dry, low plasticity, moderately calcareous.			
-10		CL	9-11 (core): Red-brown silty clay, minor fine-grained gravel, well sorted, dry, low plasticity, firm, non-cemented.		Inner casing is 2-inch schedule 40 PVC.	
-15		CL	14-16 (core): Same as above.			
-20		CL	19-21 (core): Same as above.			
					Bentonite seal from 22.5 to 25 ft.	
-25		CL	24-26 (core): Same as above becoming softer downward.		Sand pack from 25 to 37 ft.	
					2-inch PVC, No. 10 slot screen from 27 to 37 ft.	
-30		CL	29-31 (core): Red-brown silty clay, minor fine-grained gravel, well sorted, dry, soft, moderate plasticity.			
		CH	32-34 (core): Gray-brown clay, high plasticity, soft, moist.	▼		
-35						

OVERBURDEN BOREHOLE LOG

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Surface Elev.: _____ Borehole No.: GPC-O

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 4/3/01 ~~4/2/01~~

Project No.: 4228001-200 Contractor: SLC Environmental Date Finished: 10:15 4/5

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: Simco Earthprobe 200 Geoprobe

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID – Headspace (ppm) 120
0 1	1-402 1-402 3/4 full	S-1		0.6'	DK brn-blk, f. Sand (FILL)	M	SM/SP	0.7	1.5
2 3	2-402	S-2		2.0	DK brn-blk, f. Sand, tr. Slag - rust colored (FILL)	M	SP	4.7	20.3
4 5		S-3		0	0.4' DK brn, f. Sand, little f. Gravel-sized slag. 0.2' Yellow-tan sand-sized Slag. 0.6' DK brn f. Sand, little Slag	M wet			
6 7	2-402	S-4		1.8'	0.6' DK brn., slag, little f. Sand	Sat	SM 10.8	(J) 6.8'	13.4
8 9		S-5			DK brn Slag + f. Sand (FILL) Saturated	Sat			
10 11		S-6							
12									

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Surface Elev.: _____ Borehole No.: GPL-2C

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 04/02/01 1600

Project No.: 4228001-200 Contractor: SLC Environmental Date Finished: 1610

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: Geoprobe

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)
0					Dk brn-blk f. Sand, tr. Slag (cs sand to gravel-sized), tr. Cinders	M			
	1-4"							0	
1		1			Second Sample - 1.6' recovery, same PID results				
				1.5'	+ similar soils.				C
2		1							
		4						0	
3									
4					<2" Recovery on initial sample attempt.				
	1-4"				Moved hole 6" + resampled from surface				
5				1.3'				11.2	
		N			as above				20.6
6									
		1							
7		4							
8									

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Surface Elev.: _____ Borehole No.: GPN - 35

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 4/3/01 1140

Project No.: 4228001-200 Contractor: SLC Environmental Date Finished: 12/C

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: Geoprobe

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)	
0										
1	2 Hz	S-1 0-4'		0						
2					DK brn-blk, f. Sand, tr. gravel-sized slag,	M				
3		S-2		1.6	tr. Gravel, tr. Glass, tr. Brick			0.4	1.8	1115 P.I. 13C
4										
5	2 Hz	S-3 4-8'		0						
6					DK brn-blk, f. Sand, little gravel-sized Ss	M				
7		S-4		1.5	to 1" dia	Sat		2.3	40.2	1200 P.I. 13C
8										

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Project Name: Morgan Materials Soil Invest.	Surface Elev.:	Borehole No.: GPE-20
Project No.: 4228001-200	Reference Elev.:	Date Started: 04/03/0? 1700
Client: Morgan Materials, Inc.	Contractor: SLC Environmental	Date Finished: 1730
Location: 373 Hertel Ave. Buffalo, NY	Logged By: B. Walker	Method of Boring: Geoprobe

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)
0					Dk brn-black f. Sand, tr. Slag (cs. sand				
					to c. Gravel-sized) tr. Cinders.	M		0	12.6
1		\							
	[illegible]			2.5					
2					2nd Sample same PID & similar soils				
		S'							
3									
4					Poor Recovery < 4" on 1st Attempt. Moved hole				
					1' W' + Resampled.				
5									
	[illegible]	8		1.7	0.7' Dk brn-blk f. Sand and Slag (cs sand	m		0	7.3
6					to f. gravel-sized) tr. Cinders				
		1							
7		S			1.0' as above - saturated				
8									

17.

Page ___ of ___

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Surface Elev.: _____ Borehole No.: GPE-415

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 4/3/01 1300

Project No.: 4228001-200 Contractor: SLC Environmental Date Finished: 1330

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: Geoprobe

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows/6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)	
0					Dk brn-blk, f/m Sand, tr. Slag (fine gravel-sized)	M	"SM"			
1	1400	S-1	13;10	0.4				0.4		
2					Sand fill as above, tr. Cinders	M				
3				1.0	Shiny metallic-like grains at 3.1' Cinders?			6.8	232	14'
4										
5				0						
6			1;1;5	0.6	Blk, f. Sand, tr. Cinders	M				
7	1402	S-2		0.8	0.2 med gray, Slag (cs sand-sized)	M		3.3	14.8	14'
8		S-3								
9				0						
10			3;5;5		Blk, f. Sand and Slag (gravel-sized)	Sat		0		
11				1.0						
12										

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Surface Elev.: _____ Borehole No.: GPS-15

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 09/03/01 1440

Project No.: 4228001-200 Contractor: SLC Environmental Date Finished: _____

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: Geoprobe

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)
0					Paving Bricks 0.4'				
1		1			0.4' Fill - Med gray, Gravel, little f/c Sand	M		0	12
2	2-402	1		1.8	1.1' Fill - Dk gry-blk f. Sand, little Cinders, to. Slag (Gravel-sized to ½")	M		0	
3		4			0.3' Fill - Yellow-tan, Slag (cs sand to gravel-sized m to 1" dia)				
4									
5	2-402	2		1.5	1.0 Dk brn-blk f. Sand, little Slag (f-c gravel-sized to 1")	M		0	0.7
6		1			0.5 a/a saturated	Sat			
7		4						10.7	@ bottom
8									

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Surface Elev.: _____ Borehole No.: GPS-30

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 4/3/01 13:--

Project No.: 4228001-200 Contractor: SLC Environmental Date Finished: 14/0

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: Geoprobe

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Time Blows/6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)	
0										
1		S-1		0						
2					0.4 Gray Gravel (to 1/2"), tr. f. Sand	M				
	2-4		1330	1.8	1.1 Dk brn-blk f. Sand, tr. Slag (cs-sand to gravel sized), tr. Cinders			1.1	1.8	1413
3					0.4 Dk Red, rust, f. Sand and Slag (gravel-sized)	W				
4						W				
5		S-2		0						
6					0.3 Dk-brn-blk f/c Sand, tr. Slag			0.1	7.9	1413 No
	None	S-2								
7				1.1	0.8 Dk-Red-rust Slag (gravel-sized), little f/c Sand	Sat		0.0		Sam in Jar
8										

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Surface Elev.: _____ Borehole No.: GPW-7

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 04/03/01 1515

Project No.: 4228001-200 Contractor: SLC Environmental Date Finished: 1530

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: Geoprobe

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)
0					DK brn-blk, f. Sand, tr. Cinders, tr. Slag (gravel-sized to 1" dia) tr. Brick	M			
1		1		2.5				0.4	0.2
2		1							
3		2						11.0	
4					1.3' DK brn-blk, f. Sand, tr. Slag (gravel-sized to 1") tr. Cinders	M			
5		N		2.3	0.5' a/a w/ ret. brn Clay "pockets" 0.5' DK brn-blk Slag (gravel-sized to 1")			3.6	225
6		1			and f. Sand tr. Cinders	Sat			
7		2						0.7	
8									

Page ___ of ___

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Surface Elev.: _____ Borehole No.: GPW-15

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 04/03/01 12:30

Project No.: 4228001-200 Contractor: SLC Environmental Date Finished: 1130

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: Geoprobe

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)
0					Concrete ~ 4"				
1	2-4oz	S-1		0					
2					0.2' Lt. gry-white, Cs Gravel to 1" dia, tr. f. sand	M	Fill	3.1	
		S-2		1.8	0.8' DK. gry-blk, f. Sand, tr. cs Slag, tr. Brick	M	Fill	7.6 (6")	8.6
3					0.1' Red-brn - Clay, l. Mic. Silt	M	Fill	(6")	
					0.7' DK brn - lt. gry f. Sand and cs sand-sized Slag	M	Fill	5.5	
4									
5	2-4oz 3/4 full	S-2		0					
6					0.5' DK gry-blk, f. Sand and gravel-sized Slag	M		93.2 (6")	11.6
7		S-3		1.1'	0.6 As above - saturated	Sat		5.3	
8									

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Surface Elev.: _____ Borehole No.: B-6

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 8/23/01

Project No.: 4228001-200500 Contractor: Nothnagle Drilling/SLC Environmental Date Finished: 8/23/01

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: Diedrich D-50 4¼" HSA

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)
0			33		Poor Recovery				
		S-1	11	0.7	Black, f/c Sand + l. Brick, tr. Cinders	M		0	
			5		Fill				
			6						
2			3		0.2 Black Sand Fill a/a				
			3		1.0 Red-brn CLAY, some Silt, tr. Fill	M	CL		
		S-2	4	1.2	c3. Sand			0	
			4						
4			1		0.3 Clay a/a Fill			0	
		S-3	1	0.6	0.2 Black Sand & Gravel Fill	W		4.8	
			2		0.1 Clay as next above				
			3						
6			8		No Recovery				
		S-4	11	0					
			18						
			24						
8			3		Red-brn Clay as above	m			
		S-5	5	1.4				8.6	
			17						
			23						
10			5		a/a				
		S-6	9	2.0		m		15.0	
			16						
			23						
12					Abandoned Hole @ 12.0' due to lack of Granular Fill materials.				
14									
16									

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Borehole No.: ~~MW-6~~ B-6

Surface Elev.: _____

Project Name: Morgan Materials Soil Invest.

Reference Elev.: _____

Date Started: 05/23/01

Project No.: 4228001-200

Contractor: ~~SLC Environmental~~ Malvern Way

Date Finished: 05/23/01

Client: Morgan Materials, Inc.

Logged By: B. Walker

Method of Boring: ~~Geoprobe~~ 4¼" HSA Diedrich D-50

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)
0			3		Fill - Black Sand and Cinders, tr. wood, tr. Slag	m		Hole #1	C
		S-1	3	0.5					
			5						
			4						
2			3						
			3	0.5	a/a	m			3.0
		S-2	5						
			6						
			8						
4			3		a/a, tr. Gravel	w			
			5						6.2
		S-3	5	0.6					
			8						
6			3		0.6 Clay - med gray - brn, w/ black streaks, + Silt, mod. plastic	Wet - Sat			
		S-4	3	1.8				0	
			4		0.7 Clay - Red-brown, some Silt,	m			
					Stiffer soils @ ~7.0' based on augering				
8			3		a/a w/ gray silt partings	m			
		S-5	4	1.5				0	
			8						
			14						
10					Abandoned Hole @ 10' bgs Not enough sat. soils to install a well.				
12									
14									
16									

Note: 1. PID lost charge. Put samples in ziploc bag while charging PID. Screened Headspace in ziploc bag.

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Surface Elev.: _____ Borehole No.: MW-6

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 8/24/01

Project No.: 4228001-200 500 Contractor: ~~SJG Environmental~~ Nature's Way Date Finished: 8/24/01

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: 4¼" HSA

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)
0			7		0.2 - Fill - Gravel & f-l Sand, gray	m		0.0	
			37	1.1	0.2 - Fill - Sand & Cinders, black, to Gravel	m			
		S-1	12		0.3 - Fill - Co. Concrete Sand to gravel sized	m		[illegible]	
			9		0.4 - Fill Sand & Cinders, black, to Brick, to 0.4'	m		6.0	
2			3		1.0 - Fill - Slag - gravel sized to 1" dia, dk	m		2.2	
			4	1.0	brn-black, 0.1' Clay - red brn @ 0.4'				
		S-2	6		rust-colored foundry Sand, f-grained				
			9		at base (0.3' in this Sample)				
4			3		0.3 Fill - Slag, rust-colored to black, sand	m		0	
			8	0.3	to gravel sized, some f. Sand				
		S-3	8						
			4						
6			2		Fill - Sand, f-grained, rust colored, some	Sat		0.2	
		S-4	1	0.2	f-gravel-sized Slag				
			2						
			1						
8			2		Fill - Slag - rust colored, little f. Sand	Sat		0	
			3	0.6					
		S-5	2						
			3						
10			5	0.1	a/a	Sat		0	
			2						
		S-6	4						
			7						
12			7		a/a - dk gray - black	Sat		0	
			3	0.5					
		S-7	1						
			2						
14			3		0.5 - a/a	Sat		0	
			4	0.7					
		S-8	4		0.2 Fill clay - gray w/ black streaks, some silt	Sat			
			2						
16			4		0.1 - Clay Fill a/a	Sat		0	
			3	1.2	1.1 - Fill - Sand & Gravel, black				
		S-9	3						
			4						

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Surface Elev.: _____ Borehole No.: MW-6

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 8/24/01

Project No.: 4228001-200 Contractor: Nature Scape Environmental Date Finished: 8/24/01

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: 4 1/4" HSA Geoprobe

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)
18			3		a/a	Sat		0	
	~~S-10~~	S-10	4	0.7					
			5						
			3						
20			2	0.1	Poor Recovery				
			2		0.1' Gray Clay, some Silt, mod. pl.	Sat		0	
		S-11	3						
			3						
22			1		0.6' Clay - gray - black, some Silt, mod pl	wet - Sat			
			3	1.6				0	
		S-12	3		1.0' Clay - red-brown, some Silt mod pl				
			5						

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Surface Elev.: _____ Borehole No.: MW-7

Project Name: Morgan Materials Soil Invest. Reference Elev.: _____ Date Started: 8/23/01

Project No.: 4228001-200 Contractor: ~~SLC Environmental~~ Natures Way Date Finished: 8/24/01

Client: Morgan Materials, Inc. Logged By: B. Walker Method of Boring: Diedrich D-50 ~~Geoprobe~~ 4¼" HSA

Location: 373 Hertel Ave. Buffalo, NY

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)
0			2	1.0	0.5 Dk. brn f/c Sand + Gravel / Fill	w		0	
		S-1	11						
			20		0.5 Gray - crushed concrete Fill	m		60	
			16						
2			12	0.7	Fill - Gravel a/c Sand, dk gray - blk	w		150	
			9	poor	Strong paint-like odor coming from				
		S-2	7	push	inside auger, ~~after~~ prior to augr				
			2		to 4.0' (Driller's note)				
4			8						
			4	0	No Recovery				
		S-3	3						
			4						
6			2		Fill - Gray - black, f/c Sand, little Cinders	sat		280	
			2	1.0	little Silt, Sheen @ 0.5'				
		S-4	8						
			~~8~~						
8			3	1.0	0.5 a/a	Sat		36	
			4		Sheen on water coming out of spoon			-	
		S-5	6		0.5 Fill - White - a/c Sand (Foundry)	Sat			
			10		tr. Brick fragments				
10			4		a/a 0.5'	Sat		0	
			5	0.7					
		S-6	4		0.2' Black f. Sand - Fill	Sat			
			7		(Foundry Sand)				
12			2		a/a	Sat		0	
			3						
		S-7	3	0.9					
			3						
14			1		a/a	Sat		0	
			1	0.5					
		S8	5						
			11						
16			20		0.7 a/a, tr. Gravel, tr. Organics at base	sat		~~0~~	
			17	1.1	Sheen			Not	
		S-9	9		0.4 Clay, red-brn, some Silt, mod. pl.	wet		Al	
			11		soft				

NOTES: 1 - PID battery dead.

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Project Name: Morgan Materials Soil Invest.
Project No.: 4228001-200
Client: Morgan Materials, Inc.
Location: 373 Hertel Ave. Buffalo, NY

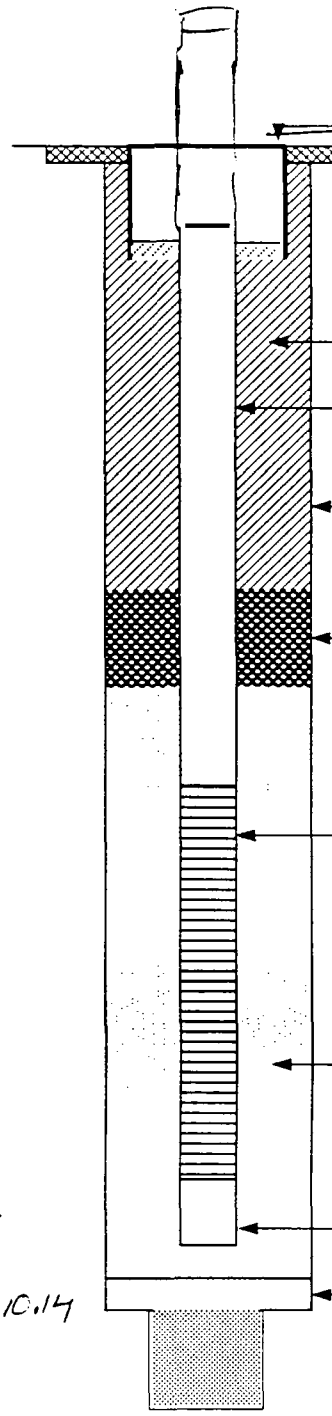
Surface Elev.: _____
Reference Elev.: _____
Contractor: ~~SLC Environmental~~ Natures Way
Logged By: B. Walker

Borehole No.: MW-7
Date Started: 8/23/01
Date Finished: 8/24/01
Method of Boring: Diedrich D-50 4¼" HSA

Depth (BGS)	Sample Collected	Sample ID	Blows / 6"	Recovery (ft.)	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Moisture	Soil Classification	PID Scan (ppm)	PID Headspace (ppm)
18			6		Clay - red-brown, some Silt,	M-Sat		NOR	
		S-10	7	1.0				1	
			9						
			10						
20									
		S-11							
22									
		S-12							
24									
				-					

MALCOLM PIRNIE, INC.		FLUSHMOUNT OVERBURDEN WELL/PIEZOMETER
Project: Morgan Materials 373 Hertel Ave Buffalo, NY	Number: 4728-001-300	P-1
Client:	Date: 8/24/01	Subcontractor: Nothnagle Drlg
Drilling Method: 4 1/4" HSA		Measuring Point
Development Method: N/A		Type: Top Of Riser
Bucking Posts: N/A		Elevation (ft):

Item	Depth, below Measuring Point (ft)	Elevation (ft)
Stick up		+ 2.90'
Grade	xxx	0
Riser Pipe	xxx	
Top of Seal	xxx	- 1.0
Top of Filter Pack	xxx	- 2.0
Top of Screen	xxx	- 3.0
Base of Screen	xxx	
End Cap	xxx	- 10.14 ~~10.14~~
Drilled Depth	xxx	~~10.14~~ 10.14
Total Depth	xxx	- 10.14



Description

~~Flushmount Diameter:~~ (in.)

~~Surface Seal Type:~~ ~~Concrete~~

~~Backfill/Grout Type:~~ Cement-bentonite

Riser Pipe Type: Sch 40 PVC

Riser Pipe ID: 2 (in.)

Borehole Diameter: ~ 8 (in.)

Type of Seal: Bentchips

Screen Type: Sch 40 PVC

Screen ID: 2 (in.)

Screen Slot Size: 0.010"

Screen Length: 7 (ft)

Filter/Sand Pack Type: Fall back

Sump: NA ~~NA 22~~

~~Fallback/Backfill:~~ ~~NA 22~~

Notes:

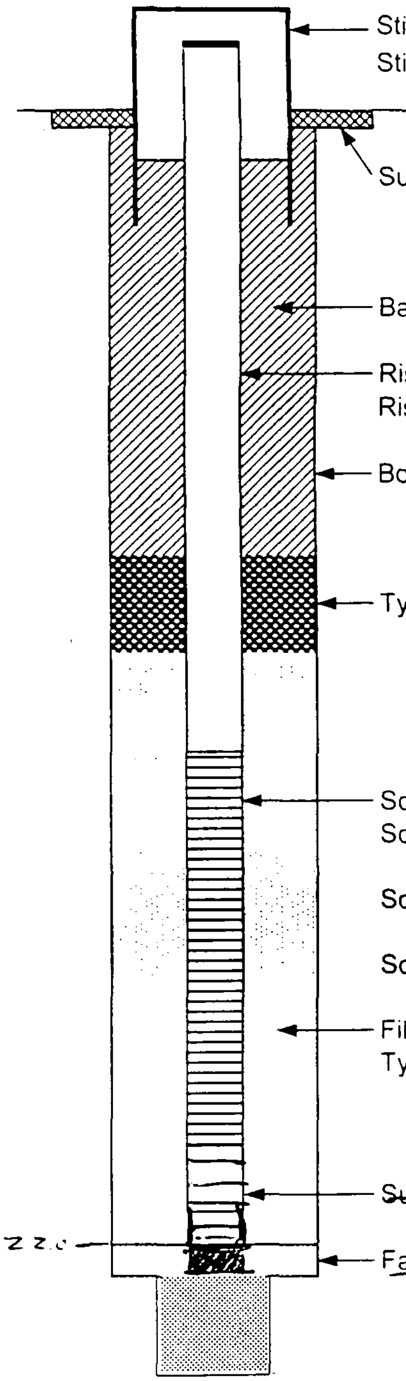
MALCOLM PIRNIE, INC.		STICKUP OVERBURDEN WELL/PIEZOMETER
Project: Morgan Materials 373 Hertel Ave Buffalo, NY	Number: ~~XXXXX-XX~~ 4228001-500	MW-6 ~~XXXXXXXX~~
Client:	Date: ~~#########~~ 8/24/01	Subcontractor: Nature ~~XXXXXXXXXXXXXXX~~
Drilling Method: Mud ~~rotary~~, (HSA), w~~hatever~~		Measuring Point
Development Method:		Type: Top Of Riser
Bucking Posts:		Elevation (ft): xxx

Item	Depth, below Measuring Point (ft)	Elevation (ft)
Stickup	xxx	+2.60'
Riser Pipe	xxx	+2.39
Grade	xxx	0
Top of Seal	xxx	2.0
Top of Filter Pack	xxx	4.0
Top of Screen	xxx	5.0
Base of Screen	xxx	
End Cap	xxx	22.0
Drilled Depth	xxx	22.5'
Total Depth	xxx	24'

~~24.41~~ ~~2.60~~ ~~2.80~~ .21 ~~2.39~~

24.41
2.39

Water level
8.22'
8/24/01
@ completion



Description

- Stickup Type: 4" Steel
- Stickup Diameter: (in.)
- Surface Seal Type: Concrete
- Backfill/Grout Type: Cement-bentonite
- Riser Pipe Type: Sch. 40 PVC
- Riser Pipe ID: 2" (in.)
- Borehole Diameter: ~8" (in.)
- Type of Seal: Bentonite Chips
- Screen Type: Sch 40 PVC
- Screen ID: 2" (in.)
- Screen Slot Size: 0.010"
- Screen Length: 17.0 (ft)
- Filter/Sand Pack Type: CCN
- ~~Sump:~~ NA 22
- ~~Fallback~~/Backfill: CCN Sand NA 22

Notes:

MALCOLM PIRNIE, INC.

STICKUP OVERBURDEN WELL/PIEZOMETER

~~XXXXXXXX~~ MW-7

Project: Morgan Materials, 323 Hertel Ave., Buffalo NY

Number: xxxxx-xx 4228-001-500

Client:

Date: ~~########~~ 8/24/01

Subcontractor: Nature ~~XXXXXXXXXXX~~

Drilling Method: ~~Mud rotary~~ (HSA) ~~whatever~~

Development Method:

Bucking Posts:

Measuring Point

Type: Top Of Riser

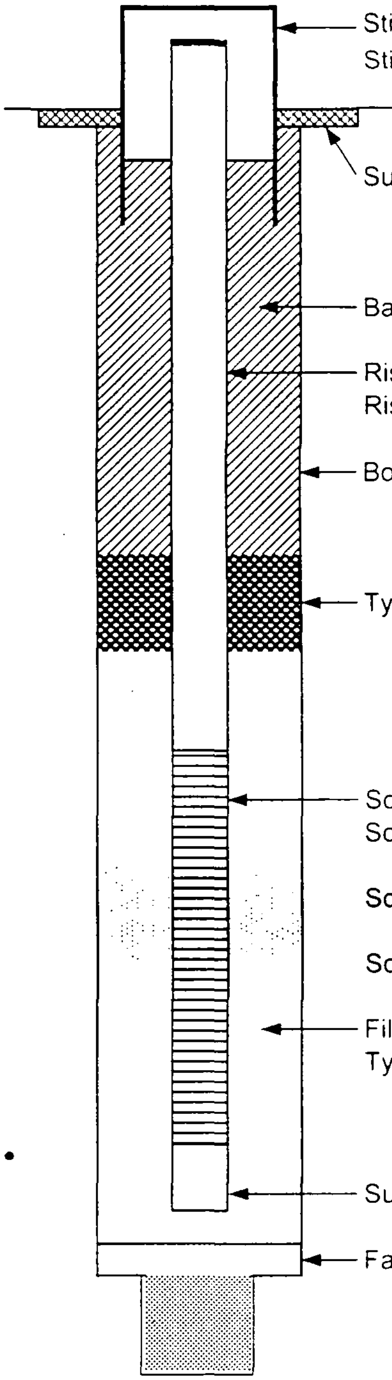
Elevation (ft): xxx

Item	Depth, below Measuring Point (ft)	Elevation (ft)
Stickup	xxx +2.07'	
Riser Pipe	xxx +1.91'	
Grade	xxx 0	
Top of Seal	xxx	2.0
Top of Filter Pack	xxx	4.0
Top of Screen	xxx	5.0 ~~[illegible]~~
Base of Screen	xxx	17.5
End Cap 0.15'	xxx	17.77
Drilled Depth	xxx	18.0
Total Depth	xxx	20.0

Water level 7.09' toC on 8/24/01 @ completion

2.07 .16 1.91

19.4 .28 19.68 1.91 17.77



Description

- Stickup Type: 4" Steel
- Stickup Diameter: ↓ (in.)
- Surface Seal Type: Concrete
- Backfill/Grout Type: Cement-bentonite
- Riser Pipe Type: Sch. 40 PVC
- Riser Pipe ID: 2 (in.)
- Borehole Diameter: ≈ 8 (in.)
- Type of Seal: Bent. Chips (hydrated)
- Screen Type: Sch. 40 PVC
- Screen ID: 2 (in.)
- Screen Slot Size: 0.010 in
- Screen Length: 12.5 (ft)
- Filter/Sand Pack Type: 00N
- Sump: Na NA ??
- Fallback/Backfill: NA ??

Notes:

MALCOLM PIRNIE

WELL PURGING AND SAMPLING LOG

PROJECT TITLE: Morgan Materials

PROJECT NO. : 4228-001-500

STAFF: B. Walker

DATE: 8/24/01

WELL NO.: MW-1

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 34.87

(2) WATER LEVEL BELOW TOP OF CASING (ft.): 2.54

(3) VOLUME OF WATER IN CASING (gal.): 5.5

(4) CASING INTERNAL DIAMETER (in.): 2"

(Vol = 0.0408 [$(2)^2$ x { (1) - (3) }])

WELL I.D.	VOL. GAL/FOOT
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	5.5	8	10	12						
Time	0735	0839	0851	0856	0905						
pH	11.25	7.07	7.01	7.03	7.13						
TEMPERATURE	20.1	15.8	15.4	13.7	14.0						
CONDUCTIVITY	1002	2410	2710	2900	3000						
TURBIDITY	10.30	172	314	488	1010						
DO mg/l	7.8	3.3	2.5	2.8	4.2						
APPEARANCE	Clear	Sl. Cldy	Cldy	Cldy Brn	Cldy Brn						
Eh		-94	-96	-98	-89						

SAMPLING DATA: Date: 8/24/01 Time: Start: 1233 Finish: 1244 Method: Bailer

Present water level (BTOC): 31.03

PHYSICAL AND CHEMICAL DATA:

Appearance: Clear x Turbid _____ Color: _____

Contains Sediment _____ Odor: _____ Other: _____

PARAMETER	Measurement	
pH	6.99	
Temperature (°C)	20.9	
Specific Conductivity (umhos/cm)	2500	
Turbidity (NTU)	42.5	
DO (mg/L)	8.2	
Eh (mV)	5	

COMMENTS: Purged w/ bailer. Purged dry @ 12.0 gal

MALCOLM PIRNIE

WELL PURGING AND SAMPLING LOG

PROJECT TITLE: Morgan Materials

PROJECT NO.: 4228-001-500

STAFF: B. Walker

DATE: 8/27/01

WELL NO.: MW-2

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 37.55

(2) WATER LEVEL BELOW TOP OF CASING (ft.): 5.47

(3) VOLUME OF WATER IN CASING (gal.): 5.5

(4) CASING INTERNAL DIAMETER (in.): 2"

(Vol = 0.0408 | (2)^2 x { (1) - (3) } |)

WELL I.D.	VOL. GAL/FOOT
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	5	8	10	12						
Time	0820	900	921	950	935						
pH	6.57	6.78	6.83	6.67	6.77						
TEMPERATURE	19.5	19.0	17.1	14.5	14.2						
CONDUCTIVITY	1934	2360	2360	3090	3270						
TURBIDITY	7.31	1076	>2000	>2000	>2000						
DO	6.5	4.2	2.7	3.2	3.8						
APPEARANCE	Clear	Cldy brn	→	→	→						
eH	182	36	-37	-36	-42						

SAMPLING DATA: Date: 8/27/01 Time: Start: 1410 Finish: 1418 Method: Bailer

Present water level (BTOC): 31.26

PHYSICAL AND CHEMICAL DATA:

Appearance: Clear ✓ Turbid _____ Color: _____

Contains Sediment _____ Odor: _____ Other: _____

PARAMETER	Measurement	
pH	7.26	
Temperature (°C)	22	
Specific Conductivity (umhos/cm)	1600	
Turbidity (NTU)	14.3	
DO (mg/L)	9.5	
Eh (mV)	-122	

Sampled @ 1500

Blind Dup-1

COMMENTS: Purged w/ bailer for 1st 2 gal. Pumped dry w/ centrifugal pump @ 6 gal. Bailed dry @ 12 gal.

MALCOLM PIRNIE

WELL PURGING AND SAMPLING LOG

PROJECT TITLE: Morgan Materials

PROJECT NO. : 4228-001-500

STAFF: B. Walker

DATE: 8/27/01

WELL NO.: MW-3

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 15.09

(2) WATER LEVEL BELOW TOP OF CASING (ft.): 6.38

(3) VOLUME OF WATER IN CASING (gal.): 1.5

(4) CASING INTERNAL DIAMETER (in.): 2

(Vol = 0.0408 [$(2)^2$ x { (1) - (3) }])

WELL I.D.	VOL. GAL/FOOT
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	7	12	16	20						
Time	1330	1333	1335	1337	1340						
pH	7.19	7.10	7.07	7.13	7.15						
TEMPERATURE	20.0	19.1	18.3	18.1	18.2						
CONDUCTIVITY	664	700	701	697	695						
TURBIDITY	267	35.1	15.1	9.61	8.67						
DO	2.5	2.6	1.5	2.0	2.4						
APPEARANCE	Cldy Brn	Clear	Clear	Clear	Clear						
eH	-190	-159	-169	-177	-172						

SAMPLING DATA: Date: 8/27/01 Time: Start: 1505 Finish: 1515 Method: Bailer

Present water level (BTOC): 6.36

PHYSICAL AND CHEMICAL DATA:

Appearance: Clear _____ Turbid Sl Color: Brn-Rust

Contains Sediment _____ Odor: _____ Other: _____

PARAMETER	Measurement	
pH	7.19	
Temperature (°C)	22.3	
Specific Conductivity (umhos/cm)	743	
Turbidity (NTU)	35	
DO (mg/L)	2.1	
Eh (mV)	-144	

COMMENTS:

MALCOLM PIRNIE

WELL PURGING AND SAMPLING LOG

PROJECT TITLE: Morgan Materials

PROJECT NO. : 4228-001-500

STAFF: B. Walker

DATE: 8/27/01

WELL NO.: MW-4

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 30.28

(2) WATER LEVEL BELOW TOP OF CASING (ft.): 10.74

(3) VOLUME OF WATER IN CASING (gal.): 3.3

(4) CASING INTERNAL DIAMETER (in.): 2

(Vol = 0.0408 [(2)^2 x { (1) - (3) }])

WELL I.D.	VOL. GAL/FOOT
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

Top of water column

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	10	20	25	30	35							
Time	1255	1305	1309	1311	1313							
pH	7.82	8.00	8.15	8.18	8.22							
TEMPERATURE	19.9	19.8	17.5	16.8	16.2							
CONDUCTIVITY	1313	1196	1232	1266	1274							
TURBIDITY	7.62	11.1	11.5	5.13	3.16							
DO	1.5	2.8	3.0	2.2	2.1							
APPEARANCE	Clear	Clear	Clear	Clear	Clear							
Eh	-183	-215	-227	-234	-244							

SAMPLING DATA: Date: 8/27/01 Time: Start: 1440 Finish: 1445 Method: Bailer

Present water level (BTOC): 10.87

PHYSICAL AND CHEMICAL DATA:

Appearance: Clear X Turbid _____ Color: _____

Contains Sediment _____ Odor: _____ Other: _____

PARAMETER	Measurement	
pH	8.31	
Temperature (°C)	21.4	
Specific Conductivity (umhos/cm)	1390	
Turbidity (NTU)	36.5	
DO (mg/L)	2.0	
Eh (mV)	-74	

COMMENTS: Purged w/ submersible pump.

MALCOLM PIRNIE

WELL PURGING AND SAMPLING LOG

PROJECT TITLE: Morgan Materials

PROJECT NO. : 4228-001-500

STAFF: B. Walker

DATE: 8/24/01

WELL NO.: MW-5

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 36.84

(2) WATER LEVEL BELOW TOP OF CASING (ft.): 4.17

(3) VOLUME OF WATER IN CASING (gal.): 5.5

(4) CASING INTERNAL DIAMETER (in.): 2

(Vol = 0.0408 [$(2)^2$ x { (1) - (3) }])

WELL I.D.	VOL. GAL/FOOT
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial	5	8	10	11						
Time	1328	1331	1335	1340	1348						
pH	6.69	6.76	6.72	6.80	6.80						
TEMPERATURE	25.2	25.6	24.9	25.6	24.5						
CONDUCTIVITY	3480	3570	3720	3780	3910						
TURBIDITY	138	19.8	67.4	60.6	175						
DO	3.0	2.6	1.8	2.6	1.8						
APPEARANCE	Sl. Cldy	Clear	Sl. Cldy	Sl. Cldy	Cldy						
eH	-61	-59			-114						

SAMPLING DATA: Date: 8/24/01 Time: Start: ~~1328~~ 15:55 Finish: 1600 Method: Bailer

Present water level (BTOC): ~~33.01~~ 33.01

PHYSICAL AND CHEMICAL DATA:

Appearance: Clear X Turbid _____ Color: _____

Contains Sediment _____ Odor: _____ Other: _____

PARAMETER	Measurement	
pH	6.79	
Temperature (°C)	25.2	
Specific Conductivity (umhos/cm)	3540	
Turbidity (NTU)	103.0	
DO (mg/L)	3.8	
Eh (mV)	56	

COMMENTS: Purged dry @ 10.0 gal w/ 2" Submersible
Bailed dry @ 11.0 gal

MALCOLM PIRNIE

WELL PURGING AND SAMPLING LOG

PROJECT TITLE: Morgan Materials

PROJECT NO. : 4228-001-500

STAFF: B. Walker

DATE: 8/27/01

WELL NO.: MW-8

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 24.41

(2) WATER LEVEL BELOW TOP OF CASING (ft.): 8.30

(3) VOLUME OF WATER IN CASING (gal.): 2.7

(4) CASING INTERNAL DIAMETER (in.): 2

(Vol = 0.0408 [$(2)^2$ x { (1) - (3) }])

WELL I.D.	VOL. GAL/FOOT
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

1 Bottom 1 middle 1 top 1

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	10	20	30	40	50	60					
Time	1120	1128	1133	1139	1145	1151					
pH	7.01	7.10	7.15	7.21	7.26	7.22					
TEMPERATURE	19.4	18.6	19.8	20.2	20.5	17.8					
CONDUCTIVITY	1247	1170	1166	1183	1198	1298					
TURBIDITY	>2000	598	545	72.3	47.2	187					
DO	1.5	2.1	1.8	2.5	1.8	1.5					
APPEARANCE	DK Gry v. cldy	Rust/ Brn cldy	→	sl. cldy							
Eh	-134	-157	-151	-199	-161	-158					

SAMPLING DATA: Date: 8/27/01 Time: Start: 1450 Finish: 1500 Method: Bailer

Present water level (BTOC): 8.31

PHYSICAL AND CHEMICAL DATA:

Appearance: Clear ✓ Turbid _____ Color: _____

Contains Sediment _____ Odor: _____ Other: _____

PARAMETER	Measurement	
pH	7.14	
Temperature (°C)	22.2	
Specific Conductivity (umhos/cm)	1034	
Turbidity (NTU)	56.9	
DO (mg/L)	1.5	
Eh (mV)	-134	

COMMENTS: Purged / developed w/ submersible pump.

MALCOLM PIRNIE

WELL PURGING AND SAMPLING LOG

PROJECT TITLE: Morgan Materials

PROJECT NO.: 4228-001-500

STAFF: B. Walker

DATE: 8/27/01

WELL NO.: MW-7

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 19.68

(2) WATER LEVEL BELOW TOP OF CASING (ft.): 7.17

(3) VOLUME OF WATER IN CASING (gal.): 2.12

(4) CASING INTERNAL DIAMETER (in.): 2

(Vol = 0.0408 [$(2)^2$ x { (1) - (3) }])

WELL I.D.	VOL. GAL/FOOT
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

Pump at Bottom of Screen | Pump at Top of Screen | Pump at Middle of Screen

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	5	10	20	35	50	70	80				
Time	0955	1000	1005	1020	1034	1044	1049				
pH	6.88	6.92	6.94	7.09	7.31	7.20	7.27				
TEMPERATURE	16.9	17.0	17.2	17.2	17.1	17.6	17.0				
CONDUCTIVITY	2660	2510	2350	1930	1930	2540	2540				
TURBIDITY	>2000	>2000	178	251	77.6	89.1	30.2				
DO	2.7	2.4	1.5	1.6	1.6	2.2	2.5				
APPEARANCE	Gry V. Cldy		Gry Sl. Cldy	→	→	→	→				
Eh	-110	-138	-155	-168	-193	-183	-190				

SAMPLING DATA: Date: 8/27/01 Time: Start: 1520 Finish: 1530 Method: Bailer

Present water level (BTOC): 7.17

PHYSICAL AND CHEMICAL DATA:

Appearance: Clear X Turbid ____ Color: ____

Contains Sediment ____ Odor: ____ Other: ____

PARAMETER	Measurement	
pH	7.10	
Temperature (°C)	23.16	
Specific Conductivity (umhos/cm)	2350	
Turbidity (NTU)	20.8	
DO (mg/L)	1.7	
Eh (mV)	-151	

COMMENTS: Development: Water very Turbid & Black initially. V. Sl. Sheen on water throughout development.

4228