AIR SOIL & WATER
ENVIRONMENTAL CONSULTING & TESTING LABORATORIES

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MAR 27 2006
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CITY OF GEORGETOWN

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MAR 27 2006
GEORGETOWN
POLICE DEPARTMENT

RECEIVED
3/27/06

March 21, 2006

Chief Greg Reeves
Georgetown Police Department
550 Bourbon Street
Georgetown, KY 40324

Re: **SITE CHECK SAMPLING**
Georgetown Police Department and Call Center
550 Bourbon Street
Georgetown, Kentucky

Dear Chief Reeves:

Air Soil & Water Environmental Consulting and Testing Laboratories, Inc., ASW, is pleased to submit the following report for your review. This letter report has been prepared for the investigation and findings relative to the sampling of the subsurface soil and/or groundwater associated with the former Mallard Pencil Factory located at the above referenced location. This investigation was performed to determine whether, due to the operation of the former facility, the soils and/or groundwater are impacted. The objective of the Site Check Sampling is not to define the extent of vertical or horizontal contamination but whether it exists or not.

The following details the background that necessitated the soils investigation followed by a brief description of the investigative methods, procedures, and analytical results. The report is concluded with conclusions and recommendations for further investigation.

BACKGROUND

The Mallard Pencil Factory produced pencils and ink pens at the structure from 1946 to the mid 1980's. Materials associated with the manufacture of pencils and pens, inks etc. are arsenic, lead, graphite, cadmium, and chromium, heavy metals, Volatile Organic Compounds (VOCs) and Semivolatile Organic Compounds (SVOCs), as well as part cleaners and petroleum products.

ASW was retained in January 2006 to perform a site check of the soils on the west side of the police station, soils located south of the police station, and west of the communications center. The objective of the site check was to determine the presence of the 8 RCRA metals and if screening levels indicate the presence of VOCs and SVOCs.

INVESTIGATIVE METHODS

On January 24 and 25, 2006, Mr. John L. Keller CES, CEI, IH and Maurice Lloyd P.E., CHMM conducted a limited soil sampling event in the rear of the Police Station property to determine whether soils had been impacted by the operations of the former Mallard Pencil Factory. The Site Check was not conducted for regulatory compliance or to define the extent of horizontal and vertical contamination, only to determine the presence or absence of contaminates found inside the structure.

431 South Broadway, Suite 100, Lexington, Kentucky 40508 (859) 231 7825 Fax (859) 231 0242

INVESTIGATIVE METHODS

A total of thirteen soil borings were advanced in the grass areas and around the perimeter of the call center, picnic areas and dog pen. Sampling included the collection of composite samples from intervals 0 to 1 foot and then at two-foot intervals down to the soil bedrock interface. Although the bottom sample was at least moist in all the borings, there was no groundwater encountered after leaving the boreholes open for several hours.

ASW developed a grid pattern of the area, then using a random sampling pattern within each grid; a hand auger was used to collect random aliquots at depths of 0 to 1 foot. These aliquots were composited into a single sample to represent each individual grid. These samples are identified as SS (surface samples). The sample locations are shown graphically on Figure 1 of Appendix A.

Soil sample collection from one foot to bedrock refusal was performed utilizing a truck-mounted Geoprobe® Model 5400 direct push soil sampling unit equipped with 2 1/4-inch diameter, 4-foot long steel Macro Core samplers. The samplers were internally lined with disposable Teflon sample liners to maintain the integrity of each sample. The Macro Core samplers were advanced at continuous four intervals to bedrock refusal. Each two-foot section was screened visually and with a photoionization detector (PID) for volatile vapors. Samples were then selected for analyses based upon the screening results. If the PID did not detect the presence of volatile vapors and there were no distinguishable visual features, then the bottom intervals were analyzed.

The methodologies used for sample collection, sample preservation, chain of custody (COC), sampling equipment, decontamination procedures, sampling containers, sample sizes and maximum holding times were conducted in general accordance with Regulation 40 CFR 260.11; specifically, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", USEPA SW-846.

The sampling area was primarily fill material with native soils near the soil bedrock interface. Various materials were encountered within the recovered soil including transite, pencils, graphite, dried ink, concrete, wood, and a variety of other construction materials. Boring logs indicating the types of soil and fill material encountered are attached as Appendix C. Groundwater was not encountered, but was assumed to follow surface drainage patterns toward the southwest.

INVESTIGATIVE RESULTS

Following sample screening, the samples were sent to Environmental Science Corporation in Mt. Juliet, Tennessee for analyses. At least two samples from each grid (one surface and one from borings) were sent for analyses. All of the samples were analyzed for the 8 RCRA Metals. Additionally, three samples were analyzed for VOCs and SVOCs. The samples selected for VOC and SVOC analyses were from downgradient locations (based upon anticipated groundwater flow) along the soil bedrock interface.

The results indicated that five of the eight RCRA metals (Barium, Cadmium, Chromium, Lead, and Mercury) were detected above their respective KDWM mean ambient concentrations (background). Two RCRA metals (Arsenic and Lead) exceeded the USEPA Region IX Residential PRGs. The detection limits for two metals (Selenium and Silver) were elevated above their respective KDWM mean ambient concentrations due to matrix interference within the samples. Each contaminate is discussed further below. A summary of the surface soil analytical results is contained in Table 1 (Appendix B). A summary of the deeper soil analytical results is contained in Table 2.

Arsenic - There are two PRGs for Arsenic listed by USEPA Region IX. One is for a cancer endpoint (trivalent Arsenic - 0.39 mg/kg) and one for noncancer endpoint (pentavalent Arsenic - 22 mg/kg). All of the samples contained concentrations of total Arsenic above the cancer endpoint (0.39 mg/kg), but were less than the KDWM background level of 8.9 mg/kg. The surface soil analyses ranged from 3.4 mg/kg to 6.2 mg/kg. The deep soil analyses ranged from 1.8 mg/kg to 7.4 mg/kg. Two samples (B-1 and B-3) were diluted due to matrix interference and had elevated detection limits above the cancer endpoint PRG.
Due to the inconclusive nature of the total Arsenic analyses, the remaining sample for seven sample points was sent to Severn Trent Laboratories (STL) in North Canton, OH. The samples were speciated between trivalent and pentavalent Arsenic using Method SW846 7063. The analyses indicated that both trivalent and pentavalent Arsenic were below the detection limits. Several of the detection limits were elevated due to matrix interference, but were still below the cancer endpoint PRG of 0.39 mg/kg. A summary of analyses conducted by STL are contained in Table 3 (Appendix B).

Barium - The surface soil analyses for Barium ranged from 170 mg/kg to 390 mg/kg. The deep soil analyses ranged from 210 mg/kg to 370 mg/kg. Barium was detected in all the samples above the KDWM background concentration of 111.3 mg/kg but well below the PRG of 5400 mg/kg.

Cadmium - The surface soil analyses for Cadmium ranged from 0.84 mg/kg to 2.8 mg/kg. The deep soil analyses ranged from 0.71 mg/kg to 3.8 mg/kg. Cadmium was detected in all the samples above the KDWM background concentration of 0.68 mg/kg, but well below the PRG of 37 mg/kg.

Chromium - There are three PRGs listed for Chromium. One is for hexavalent Chromium (Cr_{VI} = 30 mg/kg), one for trivalent Chromium (Cr_{III} = 100,000 mg/kg) and one for total Chromium (210 mg/kg). The total Chromium PRG assumes a 1:6 ratio of Cr_{VI}:Cr_{III}. All of the samples contained total Chromium concentrations above the KDWM background level of 20.5 mg/kg except for B-8 (8'-10.5') with 20 mg/kg, but all were less than the PRG. The surface soil analyses for total Chromium ranged from 17 mg/kg to 36 mg/kg. The deep soil analyses for total Chromium ranged from 20 mg/kg to 81 mg/kg.

After reviewing the analyses for total Chromium, the option of analyzing specific valences was presented to the Georgetown Police Department. It was decided to analyze for both trivalent and hexavalent Chromium. Due to matrix interference, the analyses for all of the surface samples and several deep soil samples were impaired, potentially revealing results that are falsely low. Despite this potential limitation, the analyses for B-2 (8'-10.5') indicated a concentration (34 mg/kg) above the PRG of 30 mg/kg.

To obtain more accurate analyses, the remaining sample volumes were sent to STL in Edison, NJ. The STL-Edison facility is one of very few in the country that can analyze for Chromium using Method SW846 7199. This is a non colorimetric analysis that allows for less matrix interference resulting in more accuracy. The results indicate none of the samples are above the PRG of 30 mg/kg. A summary of analyses conducted by STL are contained in Table 3 (Appendix B).

Lead - The surface soil analyses for Lead ranged from 56 mg/kg to 420 mg/kg. The deep soil analyses ranged from 31 mg/kg to 490 mg/kg. Lead was detected in all the samples above the KDWM background concentration of 30 mg/kg, but only two samples (SS2 and B-2) indicated results above the PRG of 400 mg/kg.

Mercury - The surface soil analyses for Mercury ranged from 0.05 mg/kg to 1.7 mg/kg. The deep soil analyses ranged from 0.058 mg/kg to 0.16 mg/kg. Mercury was detected in all the samples above the KDWM background concentration of 0.06 mg/kg except for samples SS10 (0.05 mg/kg) and B-1 (0.058 mg/kg). However, the concentrations detected were less than the PRG of 23 mg/kg.

Selenium - None of the samples indicated concentrations above the detection limits. However, all the detection limits were elevated due to matrix interferences. The detection limits were all above the KDWM background level of 0.94 mg/kg, but were well below the PRG of 390 mg/kg.

Silver - None of the samples indicated concentrations above the detection limits. However, all the detection limits were elevated due to matrix interferences. The detection limits were all above the KDWM background level of 0.42 mg/kg, but were well below the PRG of 390 mg/kg.

Volatile Organic Compounds (VOCs) – Only one VOC, Acetone in B-11 (1.1 mg/kg), was detected in the three samples analyzed; B-9 (8'-10.5'), B-10 (12'-13.5') and B-11 (8'-10'). It should be noted that Acetone is a common lab contaminant and is well below the residential PRG of 1,600 mg/kg. Also, all the analyses were diluted due to matrix interference. We do not anticipate that the dilution had a significant effect on the results.

Semivolatile Organic Compounds (SVOCs) - No SVOCs were detected in the three samples analyzed; B-9 (8'-10.5'), B-10 (12'-13.5') and B-11 (8'-10').

CONCLUSIONS AND RECOMMENDATIONS

The analytical data reasonably supports the following conclusions:

1. It can be concluded that the soils behind the Police Department consist of fill material and were impacted by the former operation of the site by the Mallard Pencil Factory.

2. Samples SS2 and B-2 contain concentrations of Lead above the residential PRG of 400 mg/kg.

3. The remaining RCRA metals recovered from the sampling event are less than the PRGs. Specifically, trivalent and pentavalent Arsenic were not recovered above the detection limits of the Method; Chromium, hexavalent and trivalent were recovered at concentrations less than the PRGs.

4. Volatile Organic Compounds (Acetone) were recovered above the detection limits in sample B11 (8'-10') but is less than the PRG and is a common lab contaminant.

5. During sample collection an Asbestos Containing Material, Transite™ was discovered in several samples in the area of the call center and kennel. The presence of Asbestos and other common construction materials supports the conclusion that the area behind the Police Department was used for disposal during the operation of the site by the Mallard Pencil Factory.

Recommendations:

1. Because of the elevated concentrations of Lead recovered in samples SS2 and B-2, the KDWM Superfund Branch must be notified.

2. Additional subsurface investigation is recommended to define the extent of vertical and horizontal contamination of the lead, and to determine the source of the hexavalent Chromium recovered in the soil. ASW's research indicates that the paint used by the pencil factory was Lead Chromate which does not contain hexavalent chrome. Off-site sources may be contributing the hexavalent Chromium or there may be chemical reactions that have altered the speciation of the Chromium.

As always, ASW is available to provide additional explanation or assist you with the recommended actions. Please feel free to contact us with any questions.

Air Soil & Water Environmental Consulting and Testing Laboratories, Inc.

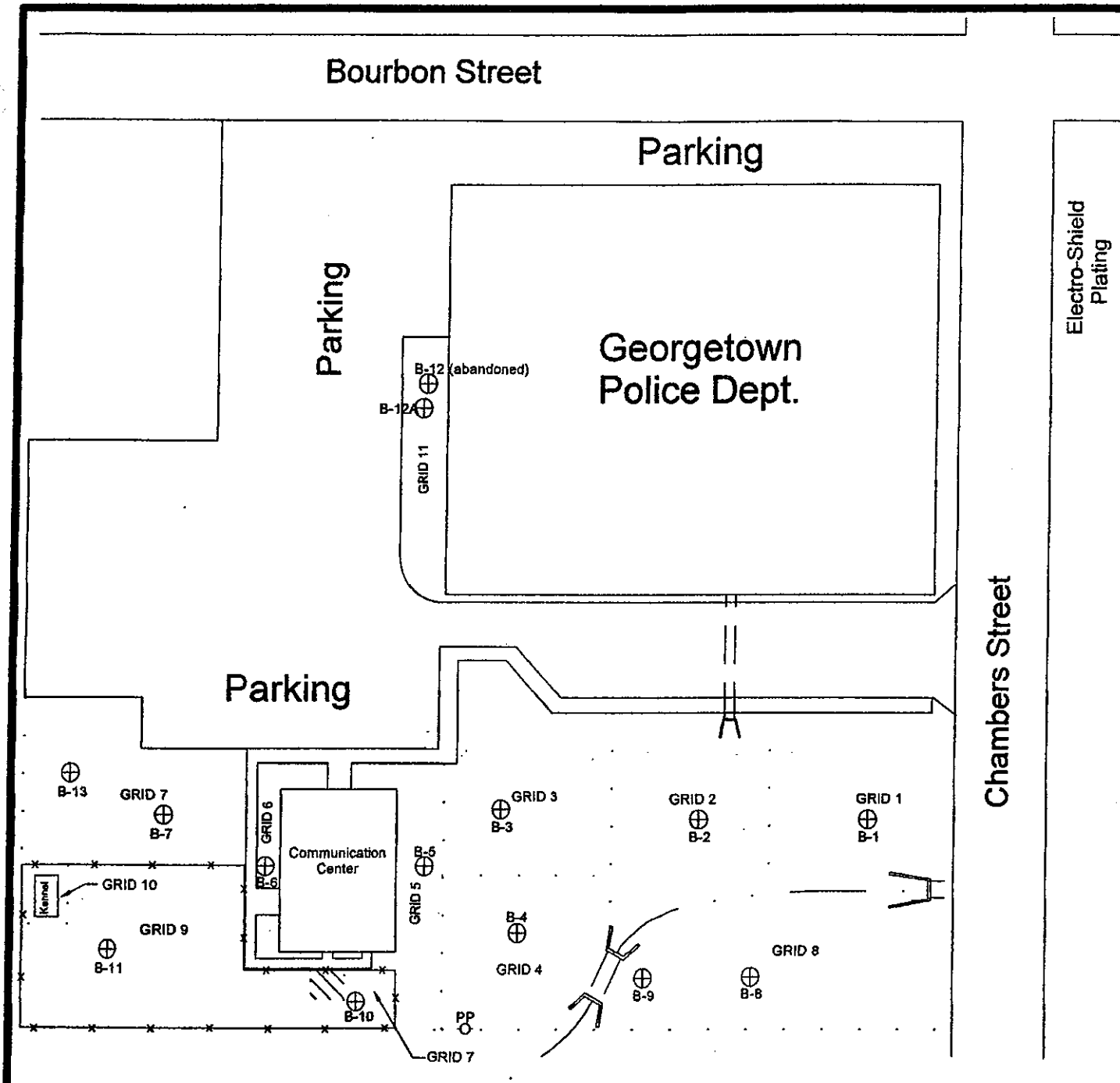
John L. Keller CES, CEI, IH

Maurice A. Lloyd, P.E., CHMM

Attached: Appendix A – Site Plan
Appendix B – Summary Tables
Appendix C – Boring Logs
Appendix D- Analytical Reports

Appendix A

Figure 1 – Sample Location Map



Legend

- B-11 Boring Location
- Existing Antenna Location
- Chain Link Fence
- Grid Boundary for Surface Samples
- Drainage Swale
- PP Power Pole

Georgetown Police Department SITE CHECK SAMPLING REPORT	
FIGURE 1 Sample Location Map	
SCALE: NTS	REVISIONS:
DATE: 2/3/06	
DRAWN BY: MAL	
PROJECT NO.:	

Appendix B

Summary Tables

Table 1
Surface Soil Analytical Summary (0 to 1 foot)

Georgetown Police Department
Site Check Sampling Report

Client Sample ID		SS-1		SS-2		SS-3		SS-4		SS-5		SS-6		SS-7		SS-8		SS-9		SS-10		SS-11	
Method	**Parameter**	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
7196A	Chromium, VI	<2.8	J6	<30.	O	<14.	O	<4.9	O	<5.2	O	<26.	O	<5.3	O	<13.	O	<13.	O	<26.	O	<4.8	O
Calc.	Chromium, III	17		24		16		14		16		19		17		19		17		16		22	
2580	ORP	65		71		87		90		89		87		95		97		72		98		75	
9045C	pH	7.7		7.5		7.5		7.8		7.5		7.5		7.6		7.9		7.6		7.4		7.4	
2540G	Total Solids	71.6		65.9		71.7		81.9		77		78.1		75.9		78.7		76.8		75.4		82.9	
7471	Mercury	0.45		1.7		0.24		0.2		0.3		0.1		0.13		0.096		0.12		0.05		0.25	
6010B	Arsenic	5.4		6.2		4.2		5.5		4.2		3.4		4.1		3.4		3.5		4.2		5.9	
6010B	Barium	170		320		260		170		190		240		240		200		250		200		280	
6010B	Cadmium	1.2		1.2		1		0.84		0.87		2.6		2.4		2.8		2.6		2.2		1.1	
6010B	Chromium	24		36		22		17		21		24		22		24		22		21		26	
6010B	Lead	290		420		100		100		110		64		120		110		78		56		72	
6010B	Selenium	<7.0	O	<7.6	O	<7.0	O	<6.1	O	<6.5	O	<13.	O	<13.	O	<13.	O	<13.	O	<6.6	O	<12.	O
6010B	Silver	<3.5	O	<3.8	O	<3.5	O	<3.0	O	<3.2	O	<3.2	O	<3.3	O	<3.2	O	<3.2	O	<3.3	O	<3.0	O

Notes

ORP Oxygen Reduction Potential

O Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.

J6 The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Table 2
Deep Soil Analytical Summary (1 foot to Refusal)

Georgetown Police Department
Site Check Sampling Report

Sample ID		B-1		B-2		B-3		B-4		B-5		B-6		B-7		B-8		B-9		B-10		B-11		B-12A		B-13	
Method	**Parameter**	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
7196A	Chromium VI	<2.6		34		<2.5		<2.5		<2.5		<2.4		<2.7		<12.	O	<2.4		<2.5		<2.7		<2.8		<2.7	
Calc.	Chromium III	26		46		25		40		24		29		40		17		23		29		38		39		41	
2580	ORP	42		65		50		63		59		53		56		63		66		70		57		60		68	
9045C	pH	7.7		8		7.9		7.7		8		7.7		6.6		7.7		7.7		7.2		7.4		6.8		7.3	
2540G	Total Solids	100		100		100		100		100		100		100		100		100		100		100		100		100	
7471	Mercury	0.058		0.16		0.064		0.083		0.12		0.069		0.11		0.13		0.069		0.07		0.085		0.096		0.095	
6010B	Arsenic	<6.4	O	7.3		<6.2	O	6.4		7.4		2.6		2.3		5		5.3		5.2		5.2		2.9		1.8	
6010B	Barium	300		220		300		370		370		270		270		210		330		260		220		300		330	
6010B	Cadmium	3.3		2.5		2.7		2.7		3.8		0.95		1.1		0.71		1.1		1		1.1		1.2		1.2	
6010B	Chromium	33		81		31		49		30		35		40		20		28		29		38		39		41	
6010B	Lead	44		490		44		38		74		56		55		120		52		52		49		49		60	
6010B	Selenium	<13.	O	<5.1	O	<12.	O	<12.	O	<12.	O	<12.	O	<14.	O	<5.9	O	<12.	O	<12.	O	<14.	O	<14.	O	<14.	O
6010B	Silver	<3.2	O	<2.6	O	<3.1	O	<3.1	O	<3.1	O	<3.0	O	<3.4	O	<3.0	O	<3.0	O	<3.1	O	<3.4		<3.5	O	<3.4	O
8260B	VOCs																	BDL	O	BDL	O	Acetone 1.1	O				
8270C	SVOCs																	BDL		BDL		BDL					

Notes

ORP	Oxygen Reduction Potential
VOCs	Volatile Organic Compounds
SVOCs	Semivolatile Organic Compounds
BDL	Below Detection Limits
O	Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.

Table 3
Arsenic and Chromium Speciation Summary

Georgetown Police Department
Site Check Sampling Report

Client Sample ID		B-2		B-8		B-11		SS-2		SS-3		SS-6		SS-10	
Method	**Parameter**	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
7199	Chromium, VI	1.2		0.87		0.92		1.2		1.1		0.41		<0.4	
7063	Arsenic, III	<0.1		<0.1		<0.1		<0.2	O	<0.1		<0.1		<0.1	
7063	Arsenic, V	<0.2	O	<0.2	O	<0.2	O	<0.4	O	<0.2	O	<0.2	O	<0.1	
MCAWW 160.3	Total Solids	78.7		85.1		74.4		72.4		75.3		79.3		74.7	

Notes

O Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.

Appendix C

Boring Logs

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 9:10	Hole No.: B-1
Project Name: Georgetown PD SI		Drilling Company:	GeoScience
Site Name: Former Mallard Pencil		Make/Model of Drill:	GeoProbe 5400
Logged By: M. Lloyd		Drill Operator: Mickey	
Sample Type: Composite		Sampler Diameter:	2" Macro Core
Surface Elevation: Not surveyed		Boring Depth: 9.4 ft.	Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 2	OL	Medium brown silty clay w/ 30% gravel	0 - 4	80	0.2 ppm	No odor or unusual discoloration
2 - 4	OL	Medium brown silty clay				
4 - 8	OL	Medium brown silty clay	4 - 8	100	0.2 ppm	No odor or unusual discoloration
8 - 9.4	OL	Medium brown silty clay w/ 5% gravel	8 - 9.4	90	0.2 ppm	No odor, some black discoloration
		Refusal @ 9.4 feet				Moist at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 9:45	Hole No.: B-2
Project Name: Georgetown PD SI	Drilling Company: GeoScience		
Site Name: Former Mallard Pencil	Make/Model of Drill: GeoProbe 5400		
Logged By: M. Lloyd	Drill Operator: Mickey		
Sample Type: Composite	Sampler Diameter: 2" Macro Core		
Surface Elevation: Not surveyed	Boring Depth: 7.4 ft.		Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 4	OL	Medium brown silty clay w/ 10% dark orange pencil paint fragments	0 - 4	70	0 ppm	No odor, some discoloration due to dark orange paint fragments
4 - 7.4	OL	Medium brown silty clay	4 - 7.4	100	0 ppm	No odor or unusual discoloration
		Refusal @ 7.4 feet				Moist at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 10:15	Hole No.: B-3
Project Name: Georgetown PD SI	Drilling Company: GeoScience		
Site Name: Former Mallard Pencil	Make/Model of Drill: GeoProbe 5400		
Logged By: M. Lloyd	Drill Operator: Mickey		
Sample Type: Composite	Sampler Diameter: 2" Macro Core		
Surface Elevation: Not surveyed	Boring Depth: 7.7 ft.		Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 1	OL	Dark brown silty clay w/ small concrete fragments				
1 - 2	OL	Reddish brown silty clay	0 - 4	80	0 ppm	No odor or unusual discoloration
2 - 4	OL	Medium brown silty clay w/ 5% gravel				
4 - 6	OL	Medium brown silty clay	4 - 7.7	60	0 ppm	No odor or unusual discoloration
6 -7.7	OL	Dark brown silty clay w/ 10% gravel				
		Refusal @ 7.7 feet				Dry at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 10:45	Hole No.: B-4
Project Name: Georgetown PD SI	Drilling Company: GeoScience		
Site Name: Former Mallard Pencil	Make/Model of Drill: GeoProbe 5400		
Logged By: M. Lloyd	Drill Operator: Mickey		
Sample Type: Composite	Sampler Diameter: 2" Macro Core		
Surface Elevation: Not surveyed	Boring Depth: 8.5 ft.		Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 3	OL	Dark brown silty clay	0 - 4	60	0 ppm	No odor or unusual discoloration
3 - 4.5	OL	Medium brown silty clay w/ 50% concrete Fragments				
4.5 - 6.5	OL	Dark brown to black silty clay	4 - 8	100	0.3 ppm	No odor, black discoloration
6.5 - 8.5	OL	Medium brown silty clay				
			8 - 8.5	100	0 ppm	No odor or unusual discoloration
		Refusal @ 8.5 feet				Slightly moist at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 11:10	Hole No.: B-5
Project Name: Georgetown PD SI	Drilling Company: GeoScience		
Site Name: Former Mallard Pencil	Make/Model of Drill: GeoProbe 5400		
Logged By: M. Lloyd	Drill Operator: Mickey		
Sample Type: Composite	Sampler Diameter: 2" Macro Core		
Surface Elevation: Not surveyed	Boring Depth: 10.0 ft.	Sheet 1 of 1	

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 3	OL	Medium brown silty clay	0 - 4	80	0.1 ppm	No odor or unusual discoloration
3 - 4	OL	Med. brown silty clay, mottled				40% Concrete fragments
4 - 8	OH	Medium brown clay, mottled	4 - 10	100	0 ppm	No odor, gray powder noted Sample interval overpushed by 2 feet
8 - 10	OL	Dark brown silty clay				
		Refusal @ 10.0 feet				Moist at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 11:30	Hole No.: B-6
Project Name: Georgetown PD SI	Drilling Company: GeoScience		
Site Name: Former Mallard Pencil	Make/Model of Drill: GeoProbe 5400		
Logged By: M. Lloyd	Drill Operator Mickey		
Sample Type: Composite	Sampler Diameter: 2" Macro Core		
Surface Elevation: Not surveyed	Boring Depth 7.6 ft.		Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 4	OL	Medium brown silty clay w/ 10% gravel	0 - 4	90	0 ppm	No odor or unusual discoloration
4 - 6	OL	Medium brown silty clay w/ 30% gravel	4 - 7.6	70	0.1 ppm	No odor, some streaking
6 - 7.6	OL	Medium brown silty clay w/ light brown streaking				
		Refusal @ 7.6 feet				Slightly moist at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 11:50	Hole No.: B-7
Project Name: Georgetown PD SI		Drilling Company:	GeoScience
Site Name: Former Mallard Pencil		Make/Model of Drill:	GeoProbe 5400
Logged By: M. Lloyd		Drill Operator Mickey	
Sample Type: Composite		Sampler Diameter:	2" Macro Core
Surface Elevation: Not surveyed		Boring Depth: 7.2 ft.	Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 2	OL	Dark brown silty clay	0 - 4	90	0 ppm	No odor or unusual discoloration
2 - 6	OL	Medium brown silty clay w/ 10% gravel	4 - 7.2	100	0 ppm	No odor, gray powder noted
6 - 7.2	OL	Medium brown silty clay w/ light brown streaking				
		Refusal @ 7.2 feet				Slightly moist at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 12:05	Hole No.: B-8
Project Name: Georgetown PD SI		Drilling Company:	GeoScience
Site Name: Former Mallard Pencil		Make/Model of Drill:	GeoProbe 5400
Logged By: M. Lloyd		Drill Operator: Mickey	
Sample Type: Composite		Sampler Diameter:	2" Macro Core
Surface Elevation: Not surveyed		Boring Depth: 10.5 ft.	Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 5	OL	Dark brown silty clay	0 - 4	100	0.1 ppm	No odor or unusual discoloration
5 - 7	OL	Medium brown silty clay	4 - 8	100	0 ppm	No odor or unusual discoloration
7 - 10.5	OL	Medium brown silty clay w/ light brown streaking	8 - 10.5	100	0 ppm	No odor, light brown streaking
		Refusal @ 10.5 feet				Slightly moist at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 12:30	Hole No.: B-9
Project Name: Georgetown PD SI	Drilling Company:	GeoScience	
Site Name: Former Mallard Pencil	Make/Model of Drill:	GeoProbe 5400	
Logged By: M. Lloyd	Drill Operator: Mickey		
Sample Type: Composite	Sampler Diameter:	2" Macro Core	
Surface Elevation: Not surveyed	Boring Depth: 11.5 ft.		Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 8	OL	Dark brown silty clay	0 - 4	100	0 ppm	No odor or unusual discoloration
						Small stone fragments @ 4.5'
			4 - 8	90	0 ppm	No odor, light brown streaking
8 - 11.5	OL	Medium brown silty clay w/ 10% gravel	8 - 11.5	90	0 ppm	No odor, light brown streaking
		Refusal @ 11.5 feet				Slightly moist at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 14:50	Hole No.: B-10
Project Name: Georgetown PD SI	Drilling Company: GeoScience		
Site Name: Former Mallard Pencil	Make/Model of Drill: GeoProbe 5400		
Logged By: M. Lloyd	Drill Operator: Mickey		
Sample Type: Composite	Sampler Diameter: 2" Macro Core		
Surface Elevation: Not surveyed	Boring Depth: 13.5 ft.	Sheet 1 of 1	

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 2	OL	Medium brown silty clay w/ 10% gravel	0 - 4	80	0.5 ppm	No odor or unusual discoloration
2 - 7.5	OL	Medium brown silty clay w/ 40% gravel	4 - 8	60	0.1 ppm	No odor or unusual discoloration
7.5 - 9	OH	Dark brown to black clay				
9 - 13.5	OL	Medium brown silty clay w/ dark brown streaking	8 - 12	100	0.2 ppm	No odor, dark brown streaking
			12-13.5	100	0.2 ppm	
		Refusal @ 13.5 feet				Wet at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 15:20	Hole No.: B-11
Project Name: Georgetown PD SI		Drilling Company:	GeoScience
Site Name: Former Mallard Pencil		Make/Model of Drill:	GeoProbe 5400
Logged By: M. Lloyd		Drill Operator Mickey	
Sample Type: Composite		Sampler Diameter:	2" Macro Core
Surface Elevation: Not surveyed		Boring Depth 10.0 ft.	Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 5	OL	Medium brown silty clay w/ 20% concrete fragments	0 - 4	80	0 ppm	No odor or unusual discoloration Powder noted from pulverized concrete and transite fragments
5 - 6	OH	Dark brown to black clay	4 - 8	100	0 ppm	No odor or unusual discoloration transite fragments noted
6 - 10	OH	Medium brown clay w/ light brown streaks	8 - 12	100	0 ppm	No odor, light brown streaking
		Refusal @ 10.0 feet				Slightly moist at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 15:45	Hole No.: B-12
Project Name: Georgetown PD St	Drilling Company:	GeoScience	
Site Name: Former Mallard Pencil	Make/Model of Drill:	GeoProbe 5400	
Logged By: M. Lloyd	Drill Operator: Mickey		
Sample Type: Composite	Sampler Diameter:	2" Macro Core	
Surface Elevation: Not surveyed	Boring Depth: 3.9 ft.		Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 3.9	OL	Medium brown silty clay	NA	100	NA	No odor or unusual discoloration
		Refusal @ 3.9 feet				Slightly moist at refusal
		BOREHOLE ABANDONED DUE TO SHALLOW REFUSAL				

Additional Comments:

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 16:00	Hole No.: B-12A
Project Name: Georgetown PD SI		Drilling Company:	GeoScience
Site Name: Former Mallard Pencil		Make/Model of Drill:	GeoProbe 5400
Logged By: M. Lloyd		Drill Operator: Mickey	
Sample Type: Composite		Sampler Diameter:	2" Macro Core
Surface Elevation: Not surveyed		Boring Depth: 6.3 ft.	Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 5	OL	Medium brown silty clay	0 - 4	100	0 ppm	No odor or unusual discoloration
5 - 6.3	OL	Medium brown silty clay w/ light brown streaking	4 - 6.3	100	0 ppm	No odor, light brown streaking transite fragments noted
		Refusal @ 6.3 feet				Moist at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening

BOREHOLE LOG

Project No.:	Date: 1/24/06	Time: 13:05	Hole No.: B-13
Project Name: Georgetown PD SI		Drilling Company:	GeoScience
Site Name: Former Mallard Pencil		Make/Model of Drill:	GeoProbe 5400
Logged By: M. Lloyd		Drill Operator: Mickey	
Sample Type: Composite		Sampler Diameter:	2" Macro Core
Surface Elevation: Not surveyed		Boring Depth: 6.3 ft.	Sheet 1 of 1

Depth (ft)	USCS Class	Description of Materials	Sample Interval	% Rec.	Field Screen	Remarks
0 - 2	OL	Medium brown silty clay w/ light brown streaking	0 - 4	100	0 ppm	No odor, significant dark discoloration. Gray powder, transite and floor tile fragments noted.
2 - 4	OL	Medium brown silty clay w/ light brown streaking				
0 - 6.3	OH	Medium brown clay, mottled w/ 5% gravel	4 - 6.3	90	0 ppm	No odor or unusual discoloration transite and floor tile fragments noted.
		Refusal @ 6.3 feet				Slightly moist at refusal

Additional Comments: MiniRAE 2000 PID w/ 10.6eV lamp used for screening