Revised
Sampling and Analysis Report

Lower Mahoning River
(Pennsylvania)
Environmental Dredging Reconnaissance Study

Contract No. DACW59-98-D-0009

Prepared for:

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Definitions and Acronyms

COC	Chain of Custody
Contractor Lab	The laboratory performing analysis of the field samples.
DGPS	Digital global positioning system
EPA	United States Environmental Protection Agency
PID	Photoionization Detector
QA	Quality Assurance
QC	Quality Control
Duplicate Samples	Multiple grab samples, collected separately, that equally represent a medium at a given time and location. This is the required type of collocated sample for volatile organic analyses and most groundwater and surface water samples.
Equipment Blank	Samples consisting of reagent water collected from a final rinse of sampling equipment after the decontamination procedure has been performed. The purpose of rinsate blanks is to determine whether the sampling equipment is causing cross contamination of samples.
SAP	Sampling and Analysis Plan
SVOC	Semi-volatile Organic Compounds
SOW	Scope of Work
SW 846	EPA SW 846 manual, "Test Methods for Evaluation of Solid Waste"
TRPH	Total recoverable petroleum hydrocarbons
USACE	United States Army Corps of Engineers
VOC	Volatile Organic Compounds

1.0 Project Description

1.1 Site History and Contaminants

The Lower Mahoning River (Pennsylvania) Environmental Dredging Reconnaissance Study encompasses a 12 river mile section of the Mahoning River, spanning from the northwestern Pennsylvania-Ohio border (just east of Lowellville, Ohio) to 2 miles southwest of New Castle, Pennsylvania, where it joins the Shenango River. A map of the region is located in Appendix D. The major physical feature within the study area is a breached dam located at approximately River Mile 6.

Historically, the Mahoning River has been a receptor of industrial waste from the steel industry and other businesses located along its banks, mainly in Warren and Youngstown, Ohio. Beginning around 1900 and continuing for nearly 75 years, the lower Mahoning River supported one of the most industrialized steel-producing regions in the world. Although recent regulations have imposed restrictions on usage and industrial discharge into the Mahoning River, the sediment quality and river ecosystem is thought to be hindered by contaminated sediments from the region's previous industrial era.

1.2 Scope and Objective

Under the Scope of Work, WasteTron, Inc., performed sampling and subsequent analysis of the sediments and bank materials located in the study area. The objective of this investigation is to determine the nature and extent of the sediments and contamination in the study area and to estimate the volume of contaminated sediments. A copy of the Scope of Work is included in Appendix G.

2.0 Field Activities

2.1 Field Observations

While sampling for this project, field observations indicated little or no contamination in the river proper. Maps of the sampling locations (transects) are located in Appendix D. Transect #1 was located at the southern end of the Mahoning River and exhibited little or no visual contamination. Transect #2 and #3 exhibited localized potentially contamination zones, especially near the island stations and near the river/bank interfaces. The transect located just upstream of the breached dam, Transect #4 did not exhibit the accumulation of silts originally thought, even in the pool areas along the banks, and contamination in the river sediment was not observed. Transects #5, and #6, which were believed to be the worst cases and were located at the upstream end of the study, indicated darker sediments in the river but thick, oily, visually contaminated sediments were not observed. The river proper consisted mainly of coarse sand, gravel, and silt. Sediments ranged from silty sand with gravel to well graded sand with gravel. Accumulated silt deposits, in the form of silty sands/sandy silts, were found near island areas, up to 8-12" in depth, and to a lesser degree in pool and river/bank interface areas. Clayey sands encountered in the river were thought to be the start of a very dense, clayey layer underlying the loose, unconsolidated sediments. Boring logs estimating grain-sizes of sediments are located in Appendix H.

The banks were thought to have yielded the highest concentrations of contamination and analytical results confirmed higher concentrations in the bank areas than in the river sediments. Transects #4, #5, and #6, which were believed to be the worst cases and were located at the upstream end of the study, indicated contamination in the bank areas, revealing black, sheen-like characteristics. A distinctive odor was also noted in these areas as well. The banks along these transects were eroding and, in some areas, nearly vertical

in nature. In some areas, there was a plateau extending 5-10' at the base of the vertical banks. There were coarse sand, silt and gravel and some organics located on these plateaus. The vertical banks consisted of a thin (0.5-2") brown silty layer underlain by a darker layer. In Transects 4, 5, and 6, this underlying layer was black, oily-looking, and saturated. The denser, underlying layer consisted of a sandy and/or silty clay. Transects 1, 2, and 3 did not reveal visually contaminated bank materials except near the water/bank interface where a sheen was noted on the sediments and water. Boring logs estimating bank materials are located in Appendix H.

2.2 Sediment/Water Sampling in River Transects

A map exhibiting the location of the study area and sampling locations is located in Appendix D. A total of six (6) transects were identified and sampled along the 12 mile stretch of the study area. These transects are located at the upstream and downstream extents of the study area, upstream and downstream of the breached dam at approximately River Mile 6, and at two intermediate locations. In addition to sampling efforts at these six transects, a clean reference reach located upstream of the study area was sampled. The clean reference reach is intended to reflect background levels in this study. The clean reference reach was located in the same proximity as the clean reference utilized in the USACE (1999) study of the Mahoning River, Trumbull and Mahoning Counties. Sampling location maps are located in Appendix D.

Sample collection began on November 15, 1999, at the furthest downstream location and advanced upstream, with the exception of Transect #2, which had limited access on November 16, 1999 due to USACE work on bridge replacement efforts along Covert Road. The suspected least contaminated area was located in the most downstream location and the most contaminated zone was thought to be in the most upstream section of the study area. Where elutriate testing was required, water samples were collected prior to and upstream of the sampling transect.

Three to five in-river station locations were sampled along each transect. Station coordinates were recorded using a differential global positioning system (DGPS). Sampling efforts were most concentrated in the areas of reduced flow or pool areas, which tend to accumulate fine sediments. (Organic and elemental contaminates are most heavily concentrated in fine sediments.) Consideration was given to delineate the vertical and horizontal extents of sediments within each transect. Locations are described in Table 1 for sampling transects. The river had an increased flow from the increase in runoff due to recent precipitation when compared to the flow noted during field reconnaissance activities. The increased flow impeded sampling of the proposed Transect #1 and was therefore sampled at a default location. All of the other transects were sampled at or near the proposed locations. A map of the river transects is located in Appendix D.

Direct push samplers utilizing polyethylene liners was used to collect samples of the sediment from the river. Field personnel on a floating platform operated these samplers, although where river conditions were too shallow, direct entry into the river was made to obtain samples. Sampling in the river transects was advanced until refusal was obtained. Sampling advancements in the river proper were limited due to the coarse nature of the sediments, possible bedrock protrusions, and/or a very dense clay layer. Recovery in the river proper was poor. Water samples for elutriate testing were obtained by disposable bailers submerged to a minimum of 8 inches below the water surface. Decontamination of equipment was performed between each station within a transect to prevent cross-contamination. Immediately after sampling, all samples were stored in a cooler on ice. Once all stations within a transect were sampled, field personnel transported samples to a process station, located on shore, for classification and analytical packaging.

The river proper only indicated sediments of an average of 0-12" and field screening indicated highest field screening readings in the 0-6" range. These samples were submitted for analysis.

TABLE 1 SAMPLING LOCATIONS AND RATIONALES

Sampling Transect	Transect Co-ordinates	Location– Appx.River Mile #	Physical Features/Rationale
Clean Reach Transect River/Bank	41°14'25.7142 N 80°52'43.0333 W	Near Leavittsburg, Ohio River Mile 46.2	Background samples/ Upstream of study area
River/Bank Transect #1	40°58'41.0309 N 80°23'02.7272 W	River Mile 1.7	Downstream end of study area
River/Bank Transect #2	40°58'47.2165 N 80°25'15.5443 W	River Mile 4.2	Meander area
River/Bank Transect #3	41°00'53.1959 N 80°26'30.8175 W	River Mile 6.8	Downstream of breached dam/ Island zone
River/Bank Transect #4	41°00'54.4329 N 80°26'47.4531 W	River Mile 6.9	Upstream of breached dam/Pool areas
River/Bank Transect #5	41°01'09.4845 N 80°28'29.4532 W	River Mile 8.8	Pool area
River/Bank Transect #6	41°01'33.4206 N 80°30'14.4516 W	Near Pennsylvania/Ohio border/ River Mile 10.6	Upstream end of study area/ Meander area

2.3 Sediment Sampling in Bank Areas

Bank sampling followed transect sampling along the study area. Bank sampling locations were located on both sides of the river throughout the study area corresponding to all river transect locations. Four bank samples were taken at all bank locations to delineate the nature of sediment characteristics as well as contamination extent. Locations are described in Table 1 for sampling transects. Maps depicting the sampling transects and cross-section views of the banks are located in Appendix D.

Bank sampling was also accomplished with a direct push sampler utilizing polyethylene liners. Sampling in the banks yielded better recovery rates and more depth than river sampling efforts. The sampling in the banks was advanced until refusal or the contamination was thought to cease also known as the inferred limit of contamination, as determined by observations and field screening methods. Sufficient samples were collected for analytical parameters. Sampling was hindered in the bank areas by tree roots and possible large gravels. All samples were immediately stored in a cooler on ice. Decontamination procedures were employed between each sample. Once all bank samples were obtained for a particular bank side location (north or south), field personnel transported samples to a process station for classification and analytical packaging. Bank samples taken for each transect are listed in Table 3A and 3B.

Samples submitted for analysis were done so based on field observations and field screening results. Only Transects 4, 5, and 6 indicated black, oily materials within the banks. The blackest, most-contaminated samples were sent for analysis, even though they were at the 0-6" depth. This was the case in Transect 4 & 5, however, Transect #6 indicated the most-contaminated areas were not in the 0-6" range, thus deeper samples were submitted for analysis.

2.4 Discrete/Composite Sediment Sampling Requirements

All river and bank samples collected were discrete samples. Discrete samples give location and depth specific data, which are parameters of this study. Tables 2 and 3 (A and B) outline discrete sample collection within the transects. Samples were not homogenized or composited.

TABLE 2: RIVER SAMPLING LOCATIONS AND ANALYTICAL PARAMETERS

Sample Location	Sample Number	QC Sample Number	Equipment Blank	TRPH (PPM)	OTHER ANALYTICAL TESTS
River Mile 46	CR-ST1-0-6"			<20	VERTICAL PROFILING
River Mile 46	CR-ST3-0-6"			<20	
River Mile 46	CR-ST4-0-6"			<20	
River Mile 46	CR-ST5-0-6"			<20	
River Mile 1.7	RT1-ST1-0-6"			65.8	
River Mile 1.7	RT1-ST3-0-6"			<20	VERTICAL PROFILING
River Mile 1.7	RT1-ST4-0-6"			79	
River Mile 4.2	RT2-ST1-0-6"			167	
River Mile 4.2	RT2-ST3-0-6"			133	
River Mile 4.2	RT2-ST4-0-6"	RT2-ST4-0-6"		171	VERTICAL PROFILING, DUPLICATE
River Mile 4.2	RT2-ST5-0-6"			112	
River Mile 6.8	RT3-ST1-0-6"			780	
River Mile 6.8	RT3-ST2-0-6"			106	
River Mile 6.8	RT3-ST4-0-6"			4960	
River Mile 6.8	RT3-ST5-0-6"			20.2	
River Mile 6.9	RT4-ST1-0-6"			<20	
River Mile 6.9	RT4-ST3-0-6"			50.6	
River Mile 6.9	RT4-ST4-0-6"	RT4-ST4-0-6"	RT4-ST4	<20	VERTICAL PROFILING, DUPLICATE, ELUTRIATE, DIOXIN, LANDFILL PROFILING, EQUIPMENT BLANK
River Mile 6.9	RT4-ST5-0-6"			200	
River Mile 8.8	RT5-ST1-0-6"	RT5-ST1-0-6"		152	VERTICAL PROFILING, DUPLICATE
River Mile 8.8	RT5-ST2-0-6"			976	
River Mile 8.8	RT5-ST3-0-6"			600	
River Mile 8.8	RT5-ST5-0-6"			<20	
River Mile 10.6	RT6-ST1-0-6"		RT6-ST1	1250	VERTICAL PROFILING, EQUIPMENT BLANK
River Mile 10.6	RT6-ST2-0-6"			224	
River Mile 10.6	RT6-ST3-0-6"			270	
River Mile 10.6	RT6-ST4-0-6"			1760	

VERTICAL PROFILING INCLUDES VOLATILES, SEMI-VOLATILES, TAL METALS, PESTICIDES, HERBICIDES, PCBs, TRPH, pH, and CYANIDE
LANDFILL PROFILING INCLUDES TCLP

TABLE 3A: BANK SAMPLING ;ATIONS AND ANALYTICAL TESTING

Sample Location	Sample Number	QC Sample Number	Equipment Blank	TRPH (PPM)	OTHER ANALYTICAL TESTS
River Mile 46 Bank	CB-NA-0-6"			52.2	
	CB-NB-0-6"			<20	
	CB-NC-0-6"			<20	
	CB-ND-0-6"			<20	
	CB-SA-0-6"			<20	
	CB-SB-0-6"			<20	
	SB-SC-0-6"			<20	
	CB-SD-0-6"			<20	
River Mile 1.7 Bank	BT1-NA-0-6"			115	
	BT1-NB-0-6"			306	
	BT1-NC-0-6"			157	
	BT1-ND-0-6"			258	
	BT1-SA-0-6"	BT1-SAA-0-6"		105	VERTICAL PROFILING, DUPLICATE
	BT1-SB-0-6"			22.2	
	BT1-SC-0-6"			296	
	BT1-SD-0-6"			134	
River Mile 4.2 Bank	BT2-NA-0-6"			76.6	
	BT2-NB-0-6"			95.4	
	BT2-NC-0-6"			<20	
	BT2-ND-0-6"			206	
	BT2-SA-0-6"	BT2-SA-0-6"		572	VERTICAL PROFILING, DUPLICATE
	BT2-SB-0-6"			95.4	
	BT2-SC-1-2'			22	
	BT2-SD-0-6"			82.2	
River Mile 6.8 Bank	BT3-NA-0-6"		BT3-NA	41.2	EQUIPMENT BLANK
	BT3-NB-0-6"			172	
	BT3-NC-2-3'			372	
	BT3-ND-2-3'			268	
	BT3-SA-0-6"			846	
	BT3-SB-0-6"			1910	
	BT3-SC-0-6"			420	
	BT3-SD-0-6"			334	

VERTICAL PROFILING INCLUDES VOLATILES, SEMI-VOLATILES, TAL METALS, PESTICIDES, HERBICIDES, PCBs, TRPH, pH, and CYANIDE
LANDFILL PROFILING INCLUDES TCLP

TABLE 3B: BANK SAMPLING LOCATIONS AND ANALYTICAL PARAMETERS

Sample Location	Sample Number	QC Sample Number	Equipment Blank	TRPH (PPM)	OTHER ANALYTICAL TESTS
River Mile 6.9 Bank	BT4-NA-0-6"			174	
	BT4-NB-0-6"			496	
	BT4-NC-3-4'			104	
	BT4-ND-0-6"			534	
	BT4-SA-0-6"	BT4-SA-0-6"		7500	VERTICAL PROFILING, DUPLICATE
	BT4-SB-0-6"			39.2	
	BT4-SC-5-6'			4070	
	BT4-SD-0-6"			125	
River Mile 8.8 Bank	BT5-NA-0-6"	BT5-NA-0-6"	BT5-NA	171	VERTICAL PROFILING, EQUIPMENT BLANK, DUPLICATE,
	BT5-NB-0-6"			91.6	
	BT5-NC-0-6"			39	
	BT5-ND-0-6"			<20	
	BT5-SA-0-6"			57.8	
	BT5-SB-0-6"			180	
	BT5-SC-0-6"			<20	
	BT5-SD-0-6"			<20	
River Mile 10.6 Bank	BT6-NA-1-2'		BT6-NA	524	VERTICAL PROFILING, LANDFILL PROFILING, DIOXIN, EQUIPMENT BLANK
	BT6-NB-1-2'			660	
	BT6-NC-2-3'			125	
	BT6-ND-2-3'			354	
	BT6-SA-1-2'			572	
	BT6-SB-1-2'			806	
	BT6-SC-3-4'			252	
	BT6-SD-2-3'			210	

VERTICAL PROFILING INCLUDES VOLATILES, SEMI-VOLATILES, TAL METALS, PESTICIDES, HERBICIDES, PCBs, TRPH, pH, and CYANIDE
LANDFILL PROFILING INCLUDES TCLP

3.0 Discussion of Analytical Results

3.1 General

The Clean Reach was designed to be a "Upper Control" area (background samples). The location in Leavittsburg, Ohio was chosen because of its use as the Clean Reach for the previous study of the Ohio-portion of the Mahoning River (USACE/OEPA, 1999). The coordinates of this sampling location and the other sampling areas involved in this report are listed in Table 1. There were organics present in the clean bank samples but no noticeable discoloration or odor was observed.

All other transects will be compared to the Clean Reach results. Clean Reach results will be displayed in parentheses after transect test results for comparison. It should be noted that four metal parameters were higher in the Clean Reach than in any other transect. These four metals include cobalt 7.50 ppm, magnesium 6170 ppm, potassium 1690 ppm, and vanadium 17.6 ppm. The cobalt and vanadium results for other transects are only slightly less than the Clean Reach results, however, the magnesium ranges from 1100-2700 ppm (6170) in the other transects and the potassium ranges from 300-500 ppm (1690) in the other transects.

All TPH results for the Clean Reach and Clean Bank areas were <20 ppm with the exception of one bank area on the northside, which detected TPH at 52.2 ppm. The TPH result to be compared with the other transects will be the <20 ppm because it assumes any detection above this could be potentially contaminated, and this report is intended to reflect worst-case contamination.

Methylene chloride was detected in the analytical results for some samples; however, the analytical laboratory issued a memo denoting that these detections were most likely laboratory induced and therefore suspect. For this reason, they are not addressed in the summary of analytical results.

3.2 River Transects

Transect #1 was located near the St. Rt. 18/108 bridge and was a meander area of the study. The analytical received for Transect #1 indicate levels of TPH in the river proper, ranging from <20-79 ppm (<20). Station #1 was chosen for the vertical profiling suite of tests because it yielded the highest field screening reading. There were 15 metal detections above Clean Reach values for this station. Metal detections included barium at 90.5 ppm (41.1), beryllium at 0.82 ppm (<0.63), calcium at 24,600 ppm (5,900), chromium at 41.1 ppm (15.4), iron at 93,600 ppm (32,000), lead at 41.4 ppm (22.3), manganese at 1670 ppm (454), sodium at 380 ppm (170), zinc at 470 ppm (54.4), cadmium at 0.182 ppm (<0.050), and thallium at 0.630 ppm (<0.250). Arsenic, vanadium, nickel, and copper were also detected at slightly elevated levels. Semi-volatile detections include a benzo(a)pyrene at 1.21 ppm (0.367), benzo(b)flouranthene at 1.09 ppm (0.367), and flouranthene at 1.22 ppm (0.981). There were no detections of volatiles, pesticides, herbicides, or PCBs in River Transect #1 Station #1.

Transect #2 was located upstream of Transect #1, in a meander area and included an island area. TPH results, in the river proper, ranged from 112-171 ppm (<20). Vertical profiling samples were also obtained in the island area. Analytical results indicate slightly elevated results for metals with the exception of copper at 63.4 ppm (14.8), iron at 87,400 ppm (32,000), lead at 70 ppm (22.3), zinc at 524 ppm (54.4), cadmium at 1.02 ppm (<0.050), mercury at 0.160 ppm (<0.100), and thallium at 0.300 ppm (<0.250). Semi-volatile detections include benzo(a)anthracene at 5.12 ppm (0.380),

benzo(a)pyrene at 5.10 ppm (0.367), benzo(b)flouranthene at 5.08 ppm (0.367), benzo(g,h,I)perylene at 3.02 ppm (<0.195), benzo(k)flouranthene at 2.35 ppm (<0.195), chrysene at 3.14 ppm (0.319), flouranthene at 6.21 ppm (0.981), indeno(1,2,3-cd)pyrene at 3.30 ppm (0.225), and pyrene at 5.86 ppm (0.748). There were no volatile, pesticide, herbicide, or PCB detections found in this sample, however, a duplicate sample submitted for PCB analysis detected Aroclor 1260 at 0.13 ppm (<0.1).

Transect #3 was located immediately downstream of the breached dam and in an island area. Although no extensive analytical testing was performed in this area, the TPH samples were submitted for analysis. In one island station in the river proper, silts (with sand) were found approximately 8-12" in depth and the highest TPH concentration was found here at 4960 ppm (<20). TPH values in other stations within this transect ranged from 20.2-780 ppm (<20).

The location for Transect #4 was situated just upstream of the breached dam and sampling focused on pool areas along this transect. The southernmost station within the river proper registered the highest TPH level at 200 ppm (<20). From the vertical profiling sample there were several slightly elevated metal parameters. Significant metal detections included barium at 126 ppm (41.1), iron at 74,400 ppm (32,000), zinc at 275 ppm (54.4), antimony at 0.620 ppm (<0.500), and cadmium at 0.178 ppm (<0.050). A duplicate sample indicated other significant metal detections such as calcium at 30,000 ppm (5,990), manganese at 1,260 ppm (454), and thallium at 0.430 ppm (<0.250). Semi-volatile detections include anthracene at 1.76 ppm (<0.195), benzo(a)anthracene at 7.05 ppm (0.380), benzo(a)pyrene at 6.14 ppm (0.367), benzo(b)flouranthene at 5.0 ppm (0.367), benzo(g,h,I)perylene at 2.32 ppm (<0.195), benzo(k)flouranthene at 2.51 ppm (<0.195), chrysene at 4.61 ppm (0.319), flouranthene at 13.5 ppm (0.981), indeno(1,2,3-cd)pyrene at 3.17 ppm (0.225), phenanthrene at 3.4 ppm (0.589), and pyrene at 10.4 ppm (0.748). There were no volatile, pesticides, herbicides, or PCBs detected in this station sample.

Transect #5 was located at an island zone. The island consisted of coarse gravel and sand and minimal amounts of silt deposits (3-6") were found in the island area. TRPH ranged from <20 to 976 ppm (<20). Semi-volatile parameters detected included benzo(a)anthracene at 3.49 ppm (0.380), benzo(a)pyrene at 4.51 ppm (0.367), benzo(b)flouranthene at 4.22 ppm (0.367), benzo(g,h,I)perylene at 3.01 ppm (<0.195), chrysene at 2.82 ppm (0.309), flouranthene at 4.77 ppm (0.981), indeno(1,2,3-cd)pyrene at 3.25 ppm (0.225), and pyrene at 3.75 ppm (0.748). Metal analysis from the river proper indicated slightly elevated levels except for barium at 121 ppm (41.1), chromium at 45.6 ppm (15.4), copper at 103 ppm (14.8), iron at 162,000 ppm (32,000), lead at 113 ppm (22.3), manganese at 942 ppm (454), zinc at 672 ppm (54.4), arsenic at 39.6 ppm (11.2), cadmium at 1.85 ppm (<0.050), mercury at 0.240 ppm (<0.100), and antimony at 0.540 ppm (<0.250). There were no volatile, pesticide, herbicide, or PCB detections found in this sample.

At Transect #6, stations ST1 and ST4 registered the highest TPH levels with 1250 ppm (<20) and 1760 ppm (<20), respectively. Both of these stations were in the river proper, nearest the banks. There were 14 metal detections above Clean Reach values for this station. Metals analysis detected chromium at 135 ppm (15.4), copper at 97.9 ppm (14.8), iron at 144,000 ppm (32,000), lead at 179 ppm (22.3), manganese at 1460 ppm (454), zinc at 928 ppm (54.4), antimony at 0.76 ppm (<0.500), cadmium at 1.25 ppm (<0.050), mercury at 0.230 ppm (<0.100), and thallium at 0.640 ppm (<0.250). Other metal detections included barium, calcium, nickel, and sodium. The vertical profile sample semi-volatile detections include acenaphthylene at 0.987 ppm (<0.195), anthracene at 2.01 ppm (<0.195), benzo(a)anthracene at 6.14 ppm (0.380), benzo(a)pyrene at 5.79 ppm (0.367),

benzo(b)flouranthene at 5.13 ppm (0.367), benzo(g,h,i)perylene at 2.60 ppm (<0.195), benzo(k)flouranthene at 2.09 ppm (<0.195), bis(2-ethylhexyl)phthalate at 4.91 ppm (0.319), chrysene at 4.39 ppm (0.309), flouranthene at 14.3 ppm (0.981), indeno(1,2,3-cd)pyrene at 3.05 ppm (0.225), phenanthrene at 4.63 ppm (0.589), and pyrene at 9.91 ppm (0.748). The pesticide tetrachloro-m-xylene was detected at 0.143 ppm (<0.01) in this station. There were no volatile, herbicide, or PCB detections within this station.

3.3 Bank Transects

The TPH values at Bank Transect #1, from analytical data, appear to be about the same on both sides of the bank. TPH levels range from 22.9-306 ppm (<20) in this area. There was no odor or visual indication of contamination in the bank areas along this transect. The vertical profiling sample was designated to be on the southern side and in the 0-6" zone based on field screening values. Significant metal detections from the vertical profiling suite of tests include chromium at 59.7 ppm (15.4), iron at 116,000 ppm (454), zinc at 460 ppm (54.4), cadmium at 0.680 ppm (<0.050), mercury at 0.150 ppm (<0.100), and thallium at 0.450 ppm (<0.250). Semi-volatiles detections include anthracene at 1.91 ppm (<0.195), benzo(a)anthracene at 6.52 ppm (0.380), benzo(a)pyrene at 6.20 ppm (0.367), benzo(b)flouranthene at 5.88 ppm (0.367), benzo(g,h,i)perylene at 2.76 ppm (<0.195), benzo(k)flouranthene at 2.57 ppm (<0.195), chrysene at 4.94 ppm (0.309), flouranthene at 13.3 ppm (0.981), indeno(1,2,3-cd)pyrene at 3.53 ppm (0.225), phenanthrene at 6.15 ppm (0.589), and pyrene at 9.55 ppm (0.748). There were no volatiles, pesticides, herbicides, or PCBs detected in this sample.

Results for Bank Transect #2 indicate TPH concentrations ranging from <20-572 ppm (<20). The south bank area was stepped in layout and held a lot of organic material (rotting leaves) that was dark in color. The sample submitted to the laboratory for the vertical profile suite was the south bank sample nearest to the river's edge. This sample was selected based on field screening results. Target analyte list (TAL) metals in excess of Clean Reach levels included calcium at 23,200 ppm (5,990), copper at 31.1 ppm (14.8), iron at 66,300 ppm (32,000), manganese at 1,180 ppm (454), zinc at 654 ppm (54.4), and thallium at 0.620 ppm (<0.250). There were other metals detected that were slightly elevated such as barium, chromium, lead, nickel, sodium, and arsenic. Semi-volatile detections within this bank area include anthracene at 2.55 ppm (<0.195), benzo(a)anthracene at 4.12 ppm (0.380), benzo(a)pyrene at 3.60 ppm (0.367), benzo(b)flouranthene at 3.09 ppm (0.367), benzo(g,h,i)perylene at 1.82 ppm (<0.195), benzo(k)flouranthene at 1.4 ppm (<0.195), chrysene at 2.92 ppm (0.309), flouranthene at 11.5 ppm (0.981), indeno(1,2,3-cd)pyrene at 2.12 ppm (0.225), phenanthrene at 9.73 ppm (0.589), and pyrene at 7.57 ppm (0.748). There were no volatiles, pesticides, herbicides, or PCBs detected in this bank area.

Transect #3 Bank TRPH levels ranged from 41.2-372 ppm (<20) on the south side to 334-1910 ppm (<20) on the north side. The south and north side had plateaus extending approximately 5' until the banks started ascending vertically. The only visual indications of contamination in these bank areas were dark materials and a slight sheen at the bank/water interface. Only TRPH testing was conducted for this area.

Transect #4 TPH results from the bank areas indicate the south side had the highest value with 7040 ppm (<20) while the north side ranged from 104-534 ppm (<20). Significant metal detections include barium at 106 ppm (41.1), calcium at 21,600 ppm (5,990), chromium at 76.2 ppm (15.4), copper at 114 ppm (14.8), iron at 133,000 ppm (32,000), lead at 222 ppm (22.3), manganese at 1,250 ppm (454), nickel at 72.1 ppm (21.5), silver at 1.40 ppm (21.5), sodium at 446 ppm (170), zinc at 1530

ppm (54.4), antimony at 1.08 ppm (<0.500), cadmium at 2.6 ppm (<0.050), and thallium at 0.980 ppm (<0.250). There were 14 semi-volatile detections, which include acenaphthylene at 1.15 ppm (<0.195), anthracene at 8.59 ppm (<0.195), benzo(a)anthracene at 7.44 ppm (0.380), benzo(a)pyrene at 5.94 ppm (0.367), benzo(b)flouranthene at 5.76 ppm (0.367), benzo(g,h,i)perylene at 2.51 ppm (<0.195), benzo(k)flouranthene at 2.33 ppm (<0.195), chrysene at 5.59 ppm (0.309), flouranthene at 20.5 ppm (0.981), indeno(1,2,3-cd)pyrene at 3.02 ppm (0.225), 2-methlynaphthalene at 5.33 ppm (<0.195), naphthalene at 48.3 ppm (<0.195), phenanthrene at 24.2 ppm (0.589), and pyrene at 15 ppm (0.748). Volatile parameters that were detected in this station included ethylbenzene at 25 ppb (<1), o-xylene at 31 ppb (<1), and m,p-xylene at 52 ppb (<2). There were no pesticide, herbicide, or PCB detections in this station.

Transect #5 TRPH results ranged from <20-180 ppm (<20). The highest field screen reading was submitted for vertical profile testing, which was on the north shore in the 0-6" area. The materials that occurred in these banks were silty, black, indicated some organic matter (rotting leaves), and had a musty/petroleum odor. Thirteen semi-volatiles were detected at Transect #5. These detections included anthracene at 0.728 ppm (<0.195), benzo(a)anthracene at 3.71 ppm (0.380), benzo(a)pyrene at 3.09 ppm (0.367), benzo(b)flouranthene at 2.71 ppm (0.367), benzo(g,h,i)perylene at 1.25 ppm (<0.195), benzo(k)flouranthene at 1.13 ppm (<0.195), bis(2-ethylhexyl)phthalate at 0.616 ppm (0.319), chrysene at 1.76 ppm (0.309), flouranthene at 4.00 ppm (0.981), indeno(1,2,3-cd)pyrene at 1.60 ppm (0.225), naphthalene at 0.697 ppm (<0.195), phenanthrene at 1.27 ppm (0.589), and pyrene at 5.84 ppm (0.748). Metal parameters in excess of Clean Reach values include calcium at 23,600 ppm (5,990), chromium at 40.4 ppm (15.4), copper at 94 ppm (14.8), iron at 123,000 ppm (32,000), lead at 116 ppm (22.3), manganese at 1,040 ppm (454), sodium at 354 ppm (170), zinc at 792 ppm (54.4), antimony at 0.560 ppm (<0.500), cadmium at 1.40 ppm (<0.050), mercury at 0.220 ppm (<0.100), and thallium at 0.370 ppm (<0.250). Other metals detected at slightly elevated levels include barium and nickel. There were no volatile, pesticide, herbicide, or PCB detections in this sample, however, a duplicate sample analyzed for PCBs only detected Aroclor 1260 at 0.55 ppm (<0.1).

TPH results at Transect #6 from the north side ranged from 125-660 ppm (<20) while the south side detected TRPH at 210-806 ppm (<20). The vertical profiling sample was selected based on visual observation (black, mucky) and field screening results. Both of these banks exhibited this type of material. There was a thin brownish layer masking the darker, black layer which was 0.5-2" in thickness. Metal detections in this bank area include calcium at 13,000 ppm (5,990), chromium at 79.3 ppm (15.4), copper at 69.6 ppm (14.8), iron at 146,000 ppm (32,000), lead at 104 ppm (22.3), manganese at 1,380 ppm (454), sodium at 502 ppm (170), zinc at 501 ppm (54.4), cadmium at 0.650 ppm (<0.050), and mercury at 0.530 ppm (<0.100). Other metals detected slightly above Clean Reach values include barium and nickel. There were 11 semi-volatile detections including benzo(a)anthracene at 2.98 ppm (0.380), benzo(a)pyrene at 3.22 ppm (0.367), benzo(b)flouranthene at 2.81 ppm (0.367), benzo(g,h,i)perylene at 1.56 ppm (<0.195), benzo(k)flouranthene at 1.10 ppm (<0.195), bis(2-ethylhexyl)phthalate at 1.15 ppm (0.319), chrysene at 2.39 ppm (0.309), flouranthene at 6.22 (0.981), indeno(1,2,3-cd)pyrene at 1.92 ppm (0.225), phenanthrene at 1.47 ppm (0.589), and pyrene at 4.59 ppm (0.748). Chloroform was detected in the volatile analysis at 2 ppb (<1). There were no pesticides, herbicides, or PCBs detected in this sample.

3.4 Elutriate Testing

Elutriate samples were taken in the river proper at Transect #4 and Transect #6 because they were believed to be the most contaminated areas. Analytical results indicate that the water quality was not majorly impacted, only metals were slightly elevated when mixed with the sediment, thus, that dredging activities will not adversely impact water quality. A summary of analytical data is presented in Appendix B.

3.5 Landfilling Status

Landfill profiling samples were taken from two areas, River Transect #4 and Bank Transect #6. These results indicate that the dredged material will not have to be treated as hazardous or toxic waste but will probably be classified as residual waste at a designated landfill. A summary of analytical data is presented in Appendix B.

3.6 Dioxin Analysis

Dioxin analysis was performed on two samples, one from the river proper at Transect #4 and one from the bank area at Transect #6. Results indicate that the levels found in the Mahoning sediment and bank materials are well below Pennsylvania levels and RCRA corrective action standards. A summary of analytical data of dioxin parameters is presented in Appendix B.

3.7 Data Quality

Seven (7) duplicate sediment/bank material samples were taken in the river and bank areas and five (5) equipment blanks were taken during sampling activities. Duplicate analysis results are posted in river and bank compilation tables in Appendix B. The equipment blanks indicate proper equipment decontamination was employed. Equipment blank analysis is located in Appendix C.

4.0 Dredging Quantities

The estimated amount of sediments in the Mahoning River from the Pennsylvania –Ohio border to the confluence of the Shenango River is 328,500 cubic yards. This is based on the average width of the river at 140', the average depth of sediment at 1', and the length of the river at 12 miles. The estimated dredging quantity for the Mahoning River (Pennsylvania) is 86,030 cubic yards. This estimate is for the river proper. It includes island zones and sediment near bank areas. The estimated bank excavation material is 52,950 cubic yards. These estimates are defined in Appendix E.

APPENDIX A REFERENCES

The following references were used in this report.

EM-200-1-6,"Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste Projects (HTRW)," U.S. Army Corps of Engineers, October 1997

ER-1110-1-263, "Chemical Data Quality Management for Hazardous Waste Remedial Activities", U.S. Army Corps of Engineers, April 1996

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition, SW846"; Nov. 1986, revised by Revision 1, Dec. 1987; amended by Update I, July 1992, Update IIA, Aug. 1993; Update II, Sept. 1994, and Update IIB, Jan. 1995; United States Environmental Protection Agency

"Mahoning River Environmental Dredging Reconnaissance Study, Trumbull and Mahoning Counties," U.S. Army Corps of Engineers, 1999

"Technical Guidance for Screening Contaminated Sediments," New York State Dept. of Environmental Conservation, Division of Fish, Wildlife and Marine Resources, Nov. 1993, revised July 1994; Updated March 1998; Updated January 1999

"Cleanup Criteria for Contaminated Soil and Groundwater," ASTM DS 64, 1996

APPENDIX B TABLES OF ANALYTICAL DATA

SECTION 1 RIVER DATA COMPILATIONS
SECTION 2 BANK DATA COMPILATIONS
SECTION 3 ELUTRIATE ANALYSIS
SECTION 4 LANDFILL PROFILES
SECTION 5 DIOXIN ANALYSIS

SECTION 1 RIVER DATA COMPILATIONS

RIVER DATA: TAL METAL RESULTS (Results in mg/kg or ppm)
Lower Mahoning River (Pennsylvania) Environmental Dredging Study

	RIVER TRANSECT/STATION/DEPTH LOCATION							
Metal Parameter	CR-ST1-0-6"	RT1-ST3-0-6"	RT2-ST4-0-6"	RT4-ST4-0-6"	RT4-ST4-0-6"	RT5-ST1-0-6"	RT6-ST1-0-6"	RT6-ST1-0-6"
					DUPLICATE			DUPLICATE
LAB ID #	9911783-42A	9911764-01A	9911783-22A	9911764-04A	9911764-07A	9911783-21A	9911783-47A	9911783-51A
Aluminum	9690	5960	5,780	5,250	6,490	5,630	5,810	4,710
Barium	41.1	90.5	75.8	126	151	121	96.6	53.9
Beryllium	<0.63	0.82	<0.630	<0.630	<0.630	<0.630	<0.630	<0.630
Calcium	5990	24600	2,910	9,970	30,000	4,660	13,700	5,500
Chromium	15.4	41.1	30.7	17.8	27.4	45.6	135	55.7
Cobalt	7.50	6.9	4.38	4.95	4.92	6.2	5.2	4.55
Copper	14.8	18.6	63.4	14.9	26.8	103	97.9	46.8
Iron	32,000	93600	87,400	74,400	110,000	162,000	144,000	70,000
Lead	22.3	41.4	70	32.3	50.8	113	179	76.7
Magnesium	6,170	3020	1,120	2,060	2,460	1,190	2,360	1,460
Manganese	454	1670	505	771	1,260	942	1,460	697
Nickel	21.5	36.4	23.1	27.4	36.2	36.8	48.7	27.8
Potassium	1,690	366	496	351	380	424	337	414
Silver	<1.25	<1.25	<1.25	<1.25	<1.25	<1.25	1.92	<1.25
Sodium	170	380	251	301	383	425	560	295
Vanadium	17.6	20.1	13.2	14.0	14.2	16.8	17.2	13.4
Zinc	54.4	470	524	275	477	672	928	342
Antimony, Total	<0.500	<0.500	<0.500	0.620	<0.500	<0.500	0.76	<0.500
Arsenic, Total	11.2	18.2	<0.500	8.20	7.92	39.6	6.80	<0.500
Cadmium, Total	<0.050	0.182	1.02	0.178	0.075	1.85	1.25	1.65
Mercury, Total	<0.100	<0.100	0.160	<0.100	<0.100	0.240	0.230	0.37
Selenium, Total	<2.50	<5.0	<2.50	<5.00	<5.00	<2.50	<2.50	<2.50
Thallium, Total	<0.250	0.630	0.300	<0.250	0.430	0.540	0.640	0.48

< indicates non-detected results

RIVER DATA: PESTICIDE/HERBICIDE/PCB RESULTS (Reported in mg/kg or ppm)
Lower Mahoning River (Pennsylvania) Environmental Dredging Study

	RIVER TRANSECT/STATION/DEPTH LOCATIONS							
	CR-ST1-0-6"	RT1-ST3-0-6"	RT2-ST4-0-6"	RT2-ST4-0-6" DUPLICATE	RT4-ST4-0-6"	RT5-ST1-0-6"	RT5-ST1-0-6" DUPLICATE	RT6-ST1-0-6"
Lab ID #	9911783-42A	9911764-01A	9911783-22A	9911783-23A	9911764-04A	9911783-21A	9911783-43A	9911783-47A
PESTICIDES								
Tetrachloro-m-xylene	<0.01	<0.01	<0.01		<0.01	<0.010		0.143
Aldrin	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
alpha-BHC	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
beta-BHC	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
gamma-BHC	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
Chlordane	<0.10	<0.10	<0.10		<0.099	<0.100		<0.294
4,4'-DDD	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
4,4'-DDE	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
4,4'-DDT	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
Dieldrin	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
Endosulfan I	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
Endosulfan II	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
Endosulfan sulfate	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
Endrin	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
Endrin aldehyde	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
Heptachlor	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
Cheptachlor epoxide	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
Methoxychlor	<0.01	<0.01	<0.01		<0.01	<0.010		<0.029
Toxaphene	<0.10	<0.10	<0.10		<0.099	<0.100		<0.294
CHLORINATED HERBICIDES								
2,4,5-T	<0.20	<0.20	<0.20		<0.20	<0.20		<0.39
2,4,5-TP (Silvex)	<0.20	<0.20	<0.20		<0.20	<0.20		<0.39
2,4-D	<1.0	<1.0	<1.0		<0.99	<1.0		<2.0
PCBs								
Aroclor 1016	<0.1	<1.0	<0.1	<0.1	<1.0	<0.10	<0.30	<0.29
Aroclor 1221	<0.1	<1.0	<0.1	<0.1	<1.0	<0.10	<0.30	<0.29
Aroclor 1232	<0.1	<1.0	<0.1	<0.1	<1.0	<0.10	<0.30	<0.29
Aroclor 1242	<0.1	<1.0	<0.1	<0.1	<1.0	<0.10	<0.30	<0.29
Aroclor 1248	<0.1	<1.0	<0.1	<0.1	<1.0	<0.10	<0.30	<0.29
Aroclor 1254	<0.1	<1.0	<0.1	<0.1	<1.0	<0.10	<0.30	<0.29
Aroclor 1260	<0.1	<1.0	<0.1	0.13	<1.0	<0.10	<0.30	<0.29

< indicates non-detected results

RIVER DATA: SEMI-VOLATILE ORGANIC COMPOUNDS RESULTS (Reported in mg/kg or ppm)
Lower Mahoning River (Pennsylvania) Environmental Dredging Study

Semi-volatile Parameter	RIVER TRANSECT/STATION/DEPTH LOCATIONS					
	CR-ST1-0-6"	RT1-ST3-0-6"	RT2-ST4-0-6"	RT4-ST4-0-6"	RT5-ST1-0-6"	RT6-ST1-0-6"
LAB ID #	9911783-42A	9911764-01A	9911783-22A	9911764-04A	9911783-21A	9911783-47A
Acenaphthylene	<0.195	<0.980	<2.80	<0.984	<2.94	0.987
Anthracene	<0.195	<0.980	<2.80	1.76	<2.94	2.01
Benzo(a)anthracene	0.380	<0.980	5.12	7.05	3.49	6.14
Benzo(a)pyrene	0.367	1.21	5.10	6.14	4.51	5.79
Benzo(b)fluoranthene	0.367	1.09	5.08	5	4.22	5.13
Benzo(g,h,i)perylene	<0.195	<0.980	3.02	2.32	3.01	2.60
Benzo(k)fluoranthene	<0.195	<0.980	2.35	2.51	<2.94	2.09
Bis(2-ethylhexyl)phthalate	0.319	<0.980	<2.80	<0.984	<2.94	4.91
Chrysene	0.309	<0.980	3.14	4.61	2.82	4.39
Flouranthene	0.981	1.22	6.21	13.500	4.77	14.3
Indeno(1,2,3-cd)pyrene	0.225	<0.980	3.30	3.17	3.25	3.05
Phenanthrene	0.589	<0.980	<2.80	3.4	<2.94	4.63
Pyrene	0.748	<0.980	5.86	10.4	3.75	9.91

< indicates non-detected results

TRPH RIVER SAMPLING RESULTS

SAMPLING STATION	TRPH
CR	
CR-ST1-0-6"	<20
CR-ST3-0-6"	<20
CR-ST4-0-6"	<20
CR-ST5-0-6"	<20
RT1	
RT1-ST1-0-6"	65.8
RT1-ST3-0-6"	<20
RT1-ST4-0-6"	79
RT2	
RT2-ST1-0-6"	167
RT2-ST3-0-6"	133
RT2-ST4-0-6"	171
RT2-ST5-0-6"	112
RT3	
RT3-ST1-0-6"	780
RT3-ST2-0-6"	106
RT3-ST4-0-6"	4960
RT3-ST5-0-6"	20.2
RT4	
RT4-ST1-0-6"	<20
RT4-ST3-0-6"	50.6
RT4-ST4-0-6"	<20
RT4-ST5-0-6"	200
RT5	
RT5-ST1-0-6'	152
RT5-ST2-0-6"	976
RT5-ST3-0-6"	600
RT5-ST5-0-6"	<20
RT6	
RT6-ST1-0-6"	1250
RT6-ST2-0-6"	224
RT6-ST3-0-6"	270
RT6-ST4-0-6"	1760

RIVER DATA: VOLATILE ORGANIC COMPOUNDS RESULTS (Reported in ug/kg or ppb)
Lower Mahoning River (Pennsylvania) Environmental Dredging Study

Volatile Parameters	RIVER TRANSECT/STATION/DEPTH LOCATIONS					
	CR-ST1-0-6"	RT1-ST3-0-6"	RT2-ST4-0-6"	RT4-ST4-0-6"	RT5-ST1-0-6"	RT6-ST1-0-6"
LAB ID #	9911783-42A	9911764-01A	9911783-22A	9911764-04A	9911783-21A	9911783-47A
Benzene	<1	<1	<1	<1	<1	<1
Bromodichloromethoane	<1	<1	<1	<1	<1	<1
Bromoform	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Chlorobenzene	<1	<1	<1	<1	<1	<1
Chloroethane	<1	<1	<1	<1	<1	<1
Chloroform	<1	<1	<1	<1	<1	1
Chloromethane	<1	<1	<1	<1	<1	<1
Dibromochloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethene	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1	<1
Methylene chloride	<1	<1	69	<1	108	<1
Styrene	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1
Tetrachloroethene	<1	<1	<1	<1	<1	<1
Toluene	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1
Trichloroethene	<1	<1	<1	<1	<1	<1
Vinyl chloride	<1	<1	<1	<1	<1	<1
o-xylene	<1	<1	<1	<1	<1	<1
m,p-xylene	<1	<2	<8	<2	<8	<2
Acetone	<10	<10	<10	<10	<10	<10
2-Butanone	<10	<10	<10	<10	<10	<10
Carbon disulfide	<5	<5	<5	<5	<5	<5
2-Hexanone	<10	<10	<10	<10	<10	<10
4-Methyl-2-pentanone	<10	<10	<10	<10	<10	<10
Vinyl acetate	<5	<5	<5	<5	<5	<5

< indicates non-detected results

SECTION 2 BANK DATA COMPILATIONS

BANK COMPILATION: METALS
LOWER MAHONING RIVER (PENNSYLVANIA) ENVIRONMENTAL DREDGING STUDY
.February 2000

METALS	BT1-SA-0-6"	BT1-SAA-0-6"	BT2-SA-0-6"	BT4-SA-0-6"	BT5-NA-0-6"	BT6-NA-1-2'
		DUPLICATE				
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LAB ID #	9911764-02A	9911764-03A	9911783-24A	9911764-05A	9911783-44A	9911783-49A
Aluminum	5920	3470	5,480	6,270	5,620	5,260
Barium	87.5	42.8	67.8	106	69.5	57
Beryllium	<0.63	<0.63	<0.630	<0.630	<0.630	<0.630
Calcium	10,200	6,090	23,200	21,600	23,600	13,000
Chromium	59.7	67.8	24.5	76.2	40.4	79.3
Cobalt	5.48	5.30	5.5	4.2	5.32	4.75
Copper	44.1	45.5	31.1	114	94	69.6
Iron	116,000	138,000	66,300	133,000	123,000	146,000
Lead	96.0	90.8	42.2	222	116	104
Magnesium	2,200	1,270	2,790	1,620	2,100	2,160
Manganese	1,130	972	1,180	1,250	1,040	1,380
Nickel	33.7	36.5	31.4	72.1	40.6	39.2
Potassium	420	252	427	331	458	360
Silver	<1.25	<1.25	<1.25	1.40	<1.25	<1.25
Sodium	416	454	305	446	354	502
Vanadium	15.0	14.1	13.7	20.8	17	17.2
Zinc	460	328	654	1530	792	501
Antimony, Total	<0.500	<0.500	<0.500	1.08	0.560	<0.500
Arsenic, Total	3.73	2.88	11.4	13.8	10.5	5.40
Cadmium, Total	0.680	0.288	<0.050	2.6	1.40	0.650
Mercury, Total	0.150	<0.100	<0.100	<0.100	0.220	0.530
Selenium, Total	<5.00	<5.00	<2.50	<5.00	<2.50	<2.50
Thallium, Total	0.450	0.380	0.620	0.980	0.370	<0.250

< - Not detected at this reporting limit.

BANK COMPILATION: PESTICIDES/HERBICIDES/PCBs (Vertical Profile)

LOWER MAHONING RIVER (PENNSYLVANIA) ENVIRONMENTAL DREDGING STUDY

.February 2000

PESTICIDES, HERBICIDES, AND PCBs	TRANSECT #1 BT1-SA-0-6" mg/kg	TRANSECT #2 BT2-SA-0-6" mg/kg	TRANSECT #2 BT2-SAA-0-6" mg/kg	TRANSECT #4 BT4-SA-0-6" mg/kg	TRANSECT #5 BT5-NA-0-6" mg/kg	TRANSECT #5 BT5-NA-0-6" mg/kg	TRANSECT #6 BT6-NA-1-2' mg/kg
LAB ID #	9911764-02A	9911783-24A	9911783-25A	9911764-05A	9911783-44A	9911783-43A	9911783-49A
PESTICIDES			DUPLICATE			PCB	
Tetrachloro-m-xylene	N/A	N/A	N/A	N/A	<0.030	DUPLICATE	<0.029
Aldrin	<0.1	<0.01	<0.01	<0.029	<0.030	ONLY	<0.029
alpha-BHC	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
beta-BHC	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
gamma-BHC	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
Chlordane	<0.099	<0.099	<0.10	<0.291	<0.300		<0.288
4,4'-DDD	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
4,4'-DDE	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
4,4'-DDT	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
Dieldrin	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
Endosulfan I	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
Endosulfan II	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
Endosulfan sulfate	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
Endrin	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
Endrin aldehyde	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
Heptachlor	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
Cheptachlor epoxide	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
Methoxychlor	<0.1	<0.01	<0.01	<0.029	<0.030		<0.029
Toxaphene	<0.099	<0.099	<0.10	<0.291	<0.300		<0.288
CHLORONATED HERBICIDES							
2,4,5-T	<0.20	<0.20	PESTICIDE	<0.39	<0.20		<0.20
2,4,5-TP (Silvex)	<0.20	<0.20	DUPLICATE	<0.39	<0.20		<0.20
2,4-D	<1.0	<0.99	ONLY	<2.0	<1.0		<1.0
PCBs							
Aroclor 1016	<1.0	<0.1		<1.0	<0.30	<0.29	<0.29
Aroclor 1221	<1.0	<0.1		<1.0	<0.30	<0.29	<0.29
Aroclor 1232	<1.0	<0.1		<1.0	<0.30	<0.29	<0.29
Aroclor 1242	<1.0	<0.1		<1.0	<0.30	<0.29	<0.29
Aroclor 1248	<1.0	<0.1		<1.0	<0.30	<0.29	<0.29
Aroclor 1254	<1.0	<0.1		<1.0	<0.30	<0.29	<0.29
Aroclor 1260	<1.0	<0.1		<1.0	<0.30	0.55	<0.29

< - Not detected at this reporting limit.

N/A - Indicates testing was not performed for this parameter.

BANK COMPILATION- SEMI-VOLATILE ORGANIC COMPOUNDS (Vertical Profile)

LOWER MAHONING RIVER (PENNSYLVANIA) ENVIRONMENTAL DREDGING STUDY

.February 2000

SEMI-VOLATILE ORGANIC COMPOUNDS	BANK TRANSECT #1 BT1-SA-0-6" mg/kg	BANK TRANSECT #2 BT2-SA-0-6" mg/kg	BANK TRANSECT #4 BT4-SA-0-6" mg/kg	BANK TRANSECT #5 BT5-NA-0-6" mg/kg	BANK TRANSECT #6 BT6-NA-1-2' mg/kg
LAB ID #	9911764-02A	9911783-24A	9911764-05A	9911783-44A	9911783-49A
Acenaphthene	<0.984	<0.990	5.66	<0.594	<0.984
Acenaphthylene	<0.984	<0.990	1.15	<0.594	<0.984
Anthracene	1.91	2.55	8.59	0.728	<0.984
Benzo(a)anthracene	6.52	4.12	7.44	3.71	2.98
Benzo(a)pyrene	6.20	3.60	5.94	3.09	3.22
Benzo(b)fluoranthene	5.88	3.09	5.76	2.71	2.81
Benzo(g,h,i)perylene	2.76	1.82	2.51	1.25	1.56
Benzo(k)fluoranthene	2.57	1.4	2.33	1.13	1.10
Bis(2-ethylhexyl)phthalate	<0.984	<0.990	<0.984	0.616	1.15
Chrysene	4.94	2.92	5.59	1.76	2.39
Flouranthene	13.3	11.5	20.5	4.00	6.22
Flourene	<0.492	N/A	7.36	N/A	N/A
Indeno(1,2,3-cd)pyrene	3.53	2.12	3.02	1.60	1.92
2-Methlynaphthalene	<0.984	<0.990	5.33	<0.594	<0.984
Naphthalene	<0.984	<0.990	48.3	0.697	<0.984
Phenanthrene	6.15	9.73	24.2	1.27	1.47
Pyrene	9.55	7.57	15	5.84	4.59

< - Not detected at this reporting limit.

N/A - Indicates testing was not performed for this parameter.

BANK COMPILATION - VOLATILE ORGANIC COMPOUNDS RESULTS (Vertical Profile)
LOWER MAHONING RIVER (PENNSYLVANIA) ENVIRONMENTAL DREDGING STUDY
.February 2000

VOLATILE ORGANIC COMPOUNDS	BANK TRANSECT #1	BANK TRANSECT #2	BANK TRANSECT #4	BANK TRANSECT #5	BANK TRANSECT #6
	BT1-SA-0-6"	BT2-SA-0-6"	BT4-SA-0-6"	BT5-NA-0-6"	BT6-NA-1-2'
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
LAB ID #	9911764-02A	9911783-24A	9911764-05A	9911783-44A	9911783-49A
Chloroform	<1	<1	<10	<1	2*
Methylene chloride	<1	101*	<10	6*	3*
Ethylbenzene	<1	<1	25	<1	<1
o-xylene	<1	<1	31	<1	<1
m,p-xylene	<1	<1	52	<1	<1

< - Not detected at this reporting limit.
* - Probable laboratory induced results.
NOTE: ALL OTHER VOLATILE PARAMETERS WERE NON-DECTED.

TRPH BANK SAMPLING RESULTS

LOWER MAHONING RIVER (PENNSYLVANIA) ENVIRONMENTAL DREDGING STUDY

February 2000

SAMPLING STATION		TRPH		SAMPLING STATION		TRPH
CB				BT4		
CB-NA-0-6"		52.2		BT4-SA-0-6"		7500
CB-NB-0-6"		<20		BT4-SB-0-6"		39.2
CB-NC-0-6"		<20		BT4-SC-5-6'		7040
CB-ND-0-6"		<20		BT4-SD-0-6"		125
CB-SA-0-6"		<20		BT4-NA-0-6"		174
CB-SB-0-6"		<20		BT4-NB-0-6"		496
CB-SC-0-6"		<20		BT4-NC-3-4'		104
CB-SD-0-6"		<20		BT4-ND-0-6"		534
BT1				BT5		
BT1-SA-0-6"		115		BT5-NA-0-6"		171
BT1-SB-0-6"		306		BT5-NB-0-6"		91.6
BT1-SC-0-6"		157		BT5-NC-0-6"		39
BT1-SD-0-6"		258		BT5-ND-0-6"		<20
BT1-NA-0-6"		105		BT5-SA-0-6"		57.8
BT1-NB-0-6"		22.2		BT5-SB-0-6"		180
BT1-NC-0-6"		296		BT5-SC-0-6"		<20
BT1-ND-0-6"		134		BT5-SD-0-6"		<20
BT2				BT6		
BT2-NA-0-6"		76.6		BT6-NA-1-2'		524
BT2-NB-0-6"		95.4		BT6-NB-1-2'		660
BT2-NC-0-6"		<20		BT6-NC-2-3'		125
BT6-ND-0-6"		206		BT6-ND-2-3'		354
BT6-SA-1-2'		572		BT6-SA-1-2'		572
BT2-SB-0-6"		95.4		BT6-SB-1-2'		806
BT2-SC-1-2'		22		BT6-SC-3-4'		252
BT2-SD-0-6"		82.2		BT6-SD-2-3'		210
BT3						
BT3-SA-0-6"		41.2				
BT3-SB-0-6"		172				
BT3-SC-0-6"		372				
BT3-SD-0-6"		268				
BT3-NA-0-6"		846				
BT3-NB-0-6"		1910				
BT3-NC-2-3'		420				
BT3-ND-2-3'		334				

SECTION 3 ELUTRIATE ANALYSIS

ELUTRIATE SUITE- METALS AND CYANIDE
LOWER MAHONING RIVER (PENNSYLVANIA) ENVIRONMENTAL DREDGING STUDY
.February 2000

Elutriate Suite Metals, Cyanide	Elutriate Water (Pre-mix) RT4-ST4 0-6" mg/L	Elutriate (Post-mix) RT4-ST4 0-6" mg/L	Elutriate Water (Pre-mix) RT6-ST1 0-6" mg/L	Elutriate (Post-mix) RT6-ST1 0-6" mg/L
LAB ID #	9912522-04A	9912522-01A	9912522-06A	9912522-07A
Cyanide	<0.020	<0.020	<0.020	<0.020
TOTAL METALS				
Aluminum	0.078 J	<0.100	0.0760 J	<0.100
Calcium	54.4	63.5	56.2	103
Iron	0.364	0.0230 J	0.341	0.0470 J
Magnesium	12.7	13.2	13.9	15.4
Potassium	5.88	6.69	6.38	7.5
Sodium	55.2	61.8	58.9	59
METALS				
Antimony	<0.0100	<0.0100	<0.0100	<0.0100
Arsenic	<0.0100	<0.0100	0.0020 J	<0.0100
Barium	0.0350 J	0.0520 J	0.0340 J	0.0880 J
Beryllium	<0.0040	<0.004	<0.004	<0.004
Cadmium	<0.0010	<0.0010	<0.001	0.0004 J
Chromium	<0.0100	<0.0100	<0.0100	<0.0100
Cobalt	<0.100	<0.100	<0.100	<0.100
Copper	<0.100	0.0070 J	<0.100	0.0090 J
Lead	0.0010 J	<0.0100	<0.0100	<0.0100
Manganese	0.097	0.0030 J	0.091	0.534
Nickel	<0.100	<0.100	<0.100	<0.100
Selenium	<0.010	<0.0100	0.0030 J	<0.0100
Silver	<0.0500	<0.0500	<0.0500	<0.0500
Thallium	<0.005	<0.0050	<0.0050	<0.0050
Vanadium	<0.050	<0.0500	<0.0500	<0.0500
Zinc	0.0320 J	0.0320 J	0.0490 J	0.0430 J
Mercury, Total	<0.001	<0.001	<0.001	<0.001

J - Analyte detected below quantitation limits
< - Not detected at this reporting limit

SECTION 4 LANDFILL PROFILES

LANDFILL PROFILES
LOWER MAHONING RIVER (PENNSYLVANIA) ENVIRONMENTAL DREDGING STUDY
.February 2000

LANDFILL PROFILING PARAMETERS	REGULATORY LEVELS (ppm)	TRANSECT #4 BT4-ST4-0-6" (ppm)	TRANSECT #6 BT6-NA-1-2' (ppm)
LAB ID #		9911764-07A	9911783-53A
REACTIVE SULFIDE	**N/A**	<50	240
REACTIVE CYANIDE	**N/A**	0	<5.0
FLASHPOINT	**N/A**	no flash to 90oC	no flash to 90oC
TCLP METALS			
Arsenic	**5.0**	<0.500	<0.500
Barium	**100.0**	3.58	<1.0
Cadmium	**1.0**	<0.050	<0.050
Chromium	**5.0**	<0.500	<0.500
Lead	**5.0**	<0.500	<0.500
Silver	**5.0**	<0.100	<0.100
Mercury	**0.2**	<0.002	<0.002
Selenium	**1.0**	<0.100	<0.100
TCLP PESTICIDES			
Chlordane	**0.03**	<0.005	<0.004
Endrin	**0.02**	<0.02	<0.02
gamma-BHC	**0.400**	<0.049	<0.038
Heptachlor	**0.008**	<0.005	<0.004
Heptachlor epoxide	**0.008**	<0.005	<0.004
Methoxychlor	**10.0**	<0.049	<0.038
Toxaphene	**0.5**	<0.005	<0.004
TCLP HERBICIDES			
2,4,5-TP (Silvex)	**1.0**	<0.01	<0.03
2,4-D	**10.0**	<0.05	<0.16
TCLP VOLATILES			
Benzene	**0.5**	<0.050	<0.050
Carbon tetrachloride	**0.5**	<0.050	<0.050
Chlorobenzene	**100.0**	<0.050	<0.050
Chloroform	**6.0**	<0.050	<0.050
1,1-Dichloroethene	**0.7**	<0.050	<0.050
1,2-Dichloroethane	**0.5**	<0.050	<0.050
Methyl ethyl ketone	**200.0**	<1.0	<1.0
Tetrachloroethene	**0.7**	<0.050	<0.050
Trichloroethene	**0.5**	<0.050	<0.050
Vinyl chloride	**0.2**	<0.050	<0.050
TCLP SEMI-VOLATILES			
o-cresol	**200.0**	<0.02	<0.03
m,p-cresol	**200.0**	<0.05	<0.07
1,4-Dichlorobenzene	**7.5**	<0.01	<0.02
2,4-Dinitrotoluene	**0.13**	<0.01	<0.02
Hexachlorobenzene	**0.13**	<0.01	<0.02
Hexachlorobutadiene	**0.5**	<0.01	<0.02
Hexachloroethane	**3.0**	<0.01	<0.02
Nitrobenzene	**2.0**	<0.01	<0.02
Pentachlorophenol	**100.0**	<0.02	<0.03
Pyridine	**5.0**	<0.01	<0.02
2,4,5-Trichlorophenol	**400.0**	<0.02	<0.03
2,4,6-Trichlorophenol	**2.0**	<0.02	<0.03

< - Not detected at this reporting limit.

SECTION 5 DIOXIN ANALYSIS

DIOXIN SCREENING ANALYSIS

Lower Mahoning River (Pennsylvania) Environmental Dredging Study

February 2000

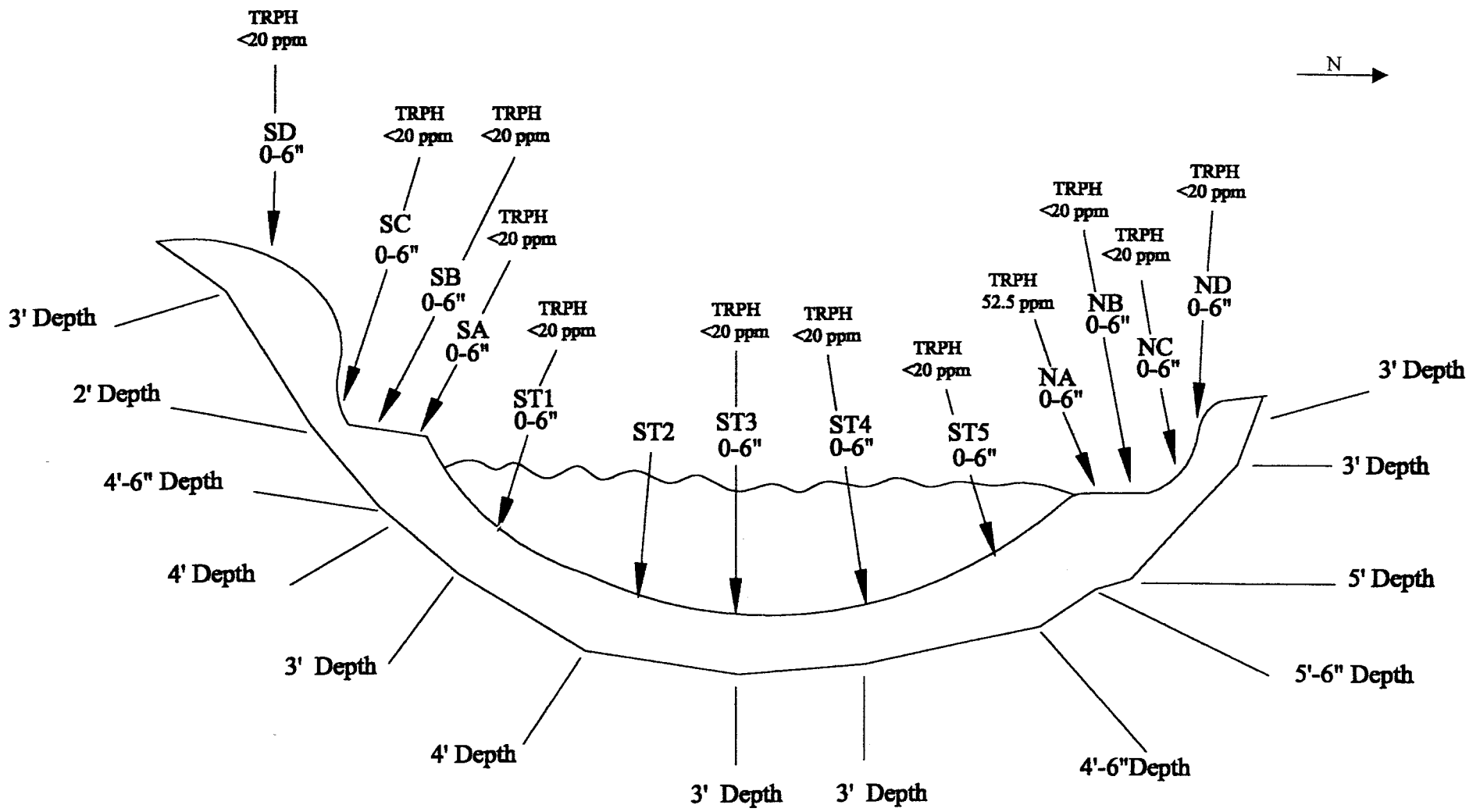
Dioxin Parameter	RT4-ST4-0-6"	BT6-NA-1-2'
	ng/g	ng/g
	(ppb)	(ppb)
LAB ID #	Lot #H9K240167 Sample #001	Lot #H9K240167 Sample #002
2,3,7,8-TCDD	<0.16	<0.14
Total TCDD	<0.16	<0.14
1,2,3,7,8-PeCDD	<0.20	<0.19
Total PeCDD	<0.52	<0.32
1,2,3,4,7,8-HxCDD	<0.16	<0.19
1,2,3,6,7,8-HxCDD	<0.14	<0.17
1,2,3,7,8,9-HxCDD	<0.15	<0.18
Total HxCDD	0.079 J,Q	<0.18
1,2,3,4,6,7,8-HpCDD	0.24 J,Q	0.40 J,Q
Total HpCDD	0.53 J,Q	0.88 J,Q
OCDD	1.6	2.9
2,3,7,8-TCDF	<0.016	<0.086
Total TCDF	0.035 J,Q	0.043 J,Q
1,2,3,7,8-PeCDF	<0.29	<0.33
2,3,4,7,8-PeCDF	<0.28	<0.25
Total PeCDF	<0.29	0.11 J,Q
1,2,3,4,7,8-HxCDF	<0.18	<0.21
1,2,3,6,7,8-HxCDF	<0.16	<0.19
2,3,4,6,7,8-HxCDF	<0.18	<0.21
1,2,3,7,8,9-HxCDF	<0.20	<0.23
Total HxCDF	0.076 J,Q	0.049 J,Q
1,2,3,4,6,7,8-HpCDF	<0.70	<0.61
1,2,3,4,7,8,9-HpCDF	<0.79	<0.62
Total HpCDF	<0.74	0.030 J,Q
OCDF	0.42 J,Q	0.48 J,Q

J - Estimated result. Result is less than the reporting limit.

Q - Estimated maximum possible concentration.

APPENDIX C CONTRACTOR ANALYTICAL DATA

APPENDIX D SITE MAPS AND TRANSECT CROSS-SECTIONS



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740-574-6144

Lower Mahoning River
(Pennsylvania)
Environmental Dredging
Reconnaissance Study

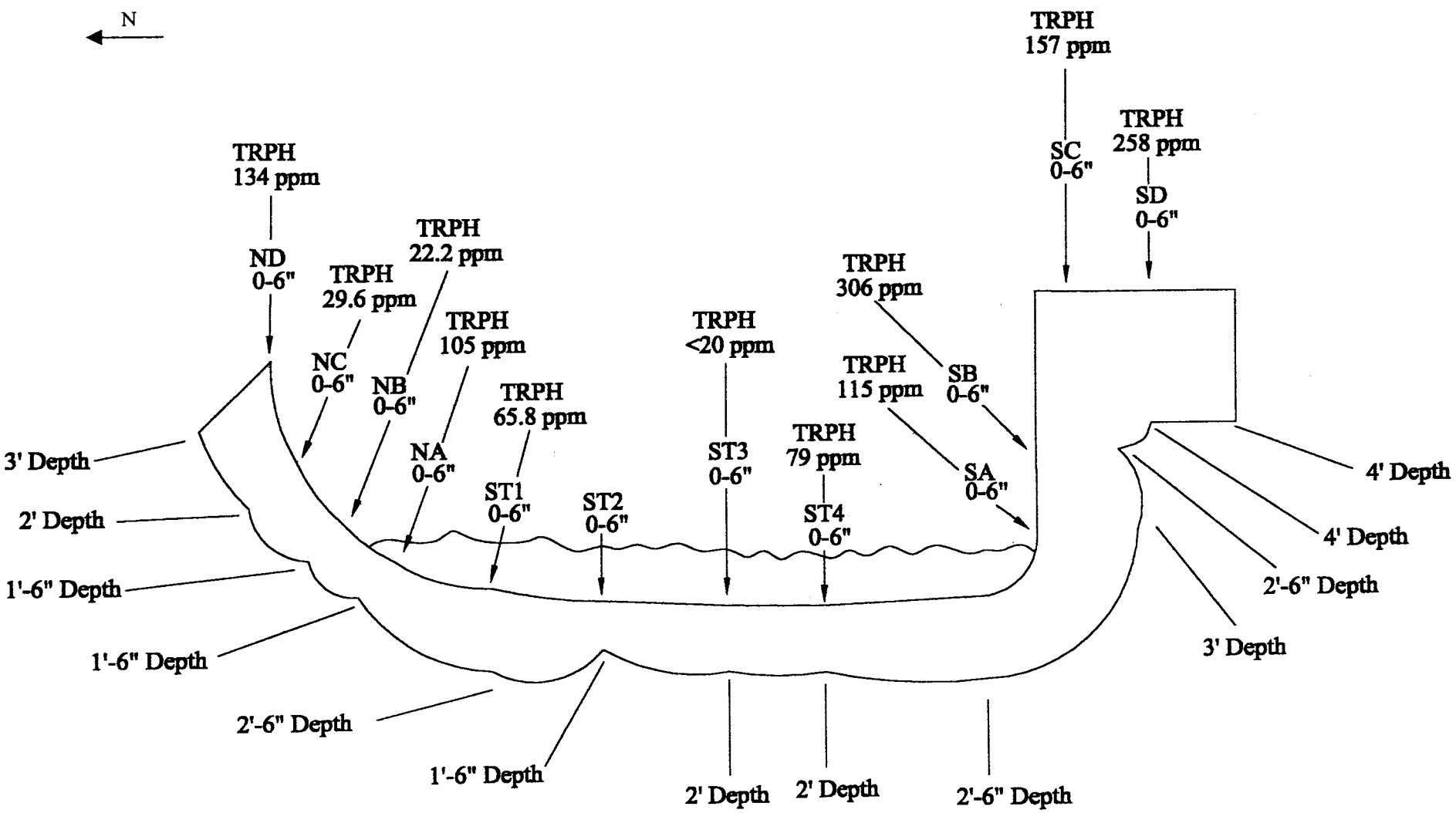
Clean Reach
Transect Cross Section

DRAWN	CHECKED	APPROVED	DATE	SCALE
SG	JG	JG	4/27/00	None

FILE 4568 LAYERS None

FIGURE NO 1

REV.



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Lower Mahoning River
(Pennsylvania)
Environmental Dredging
Reconnaissance Study

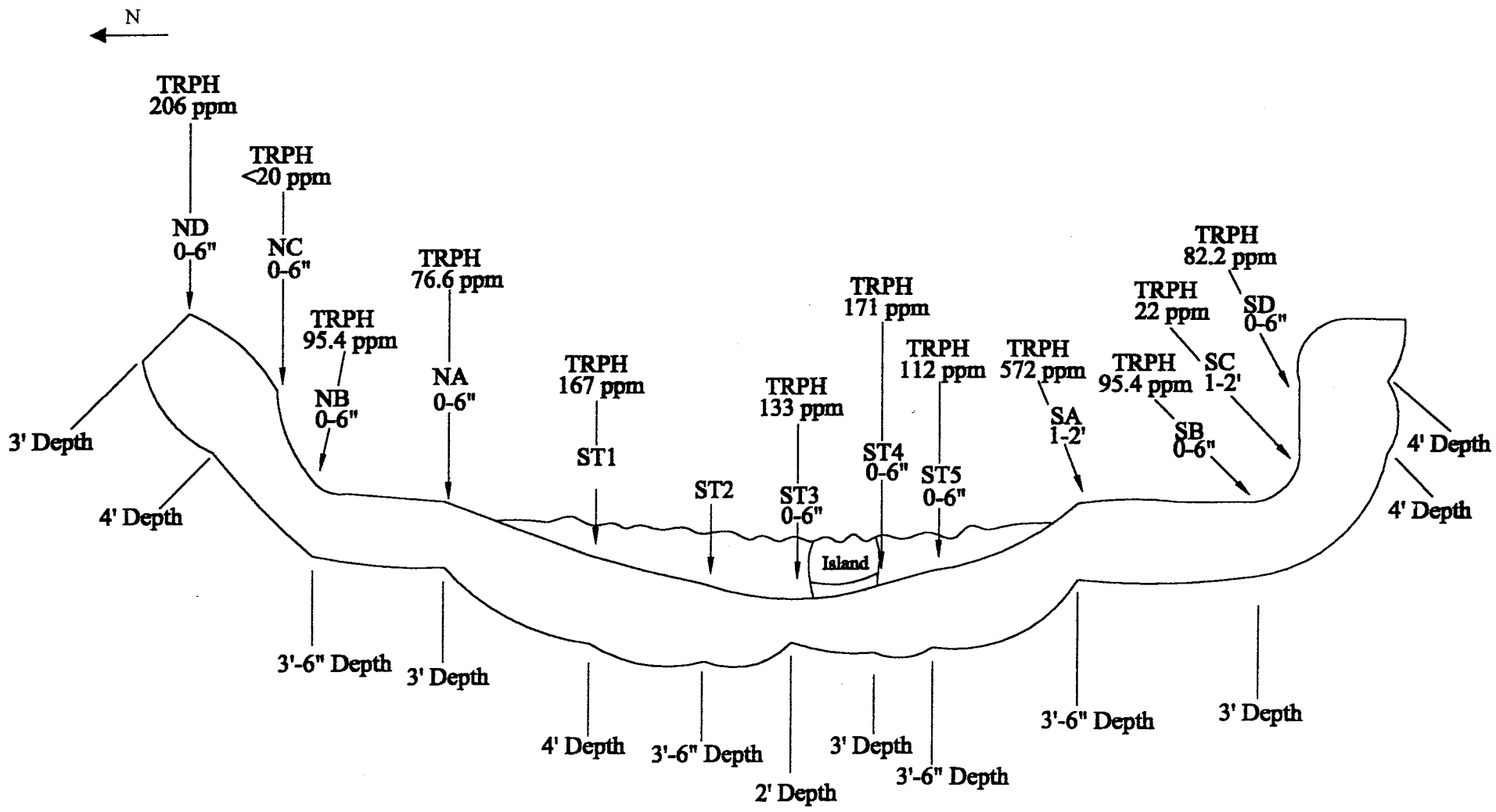
Transect #1 Cross Section

DRAWN	CHECKED	APPROVED	DATE	SCALE
SG	JG	JG	4/27/00	None

FILE 4568 LAYERS None

FIGURE NO 2

REV.



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Lower Mahoning River
(Pennsylvania)
Environmental Dredging
Reconnaissance Study

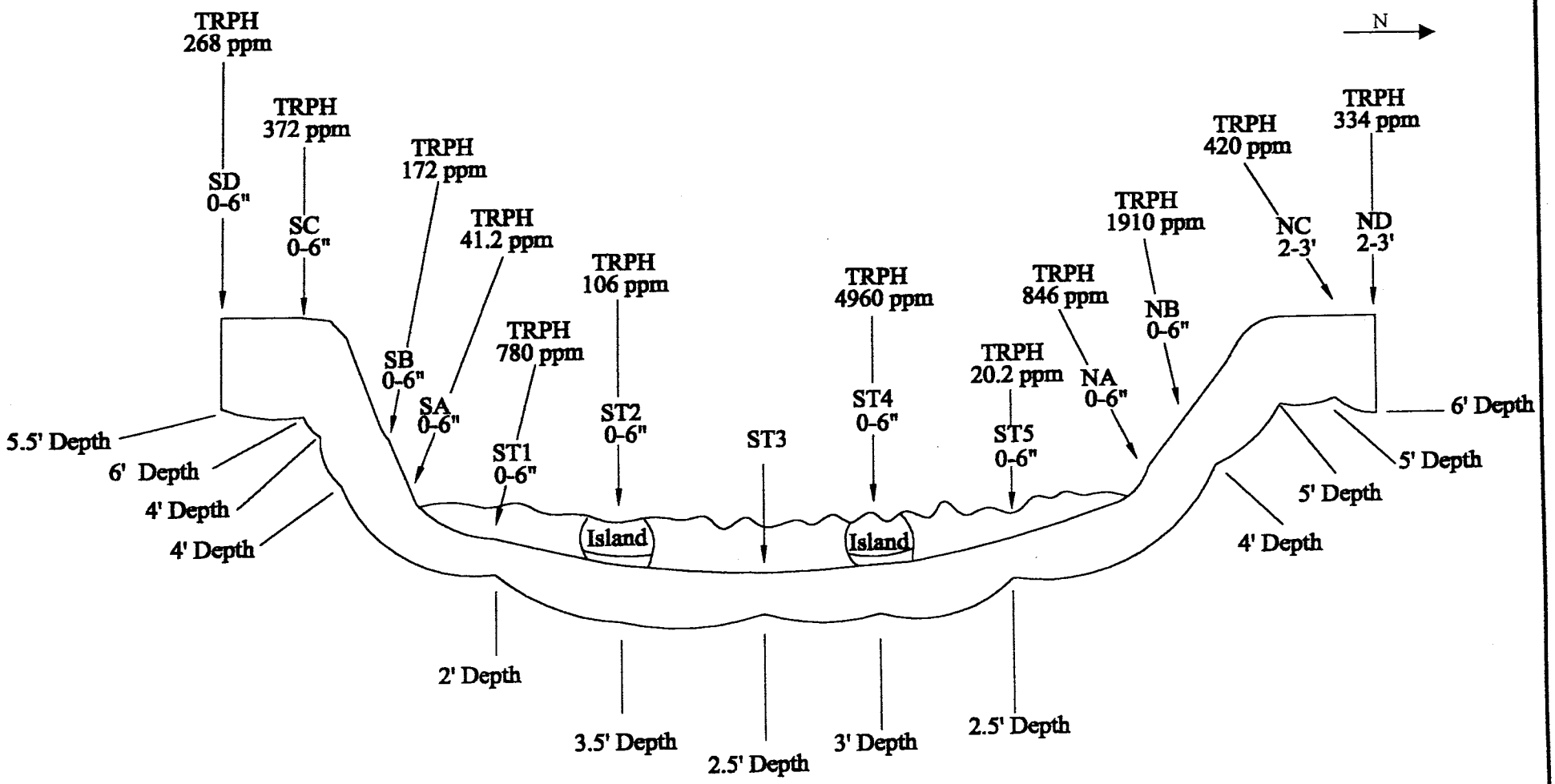
Transect #2 Cross Section

DRAWN	CHECKED	APPROVED	DATE	SCALE
SG	JG	JG	4/27/00	None

FILE 4568 LAYERS None

FIGURE NO 3

REV.



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Lower Mahoning River
(Pennsylvania)
Environmental Dredging
Reconnaissance Study

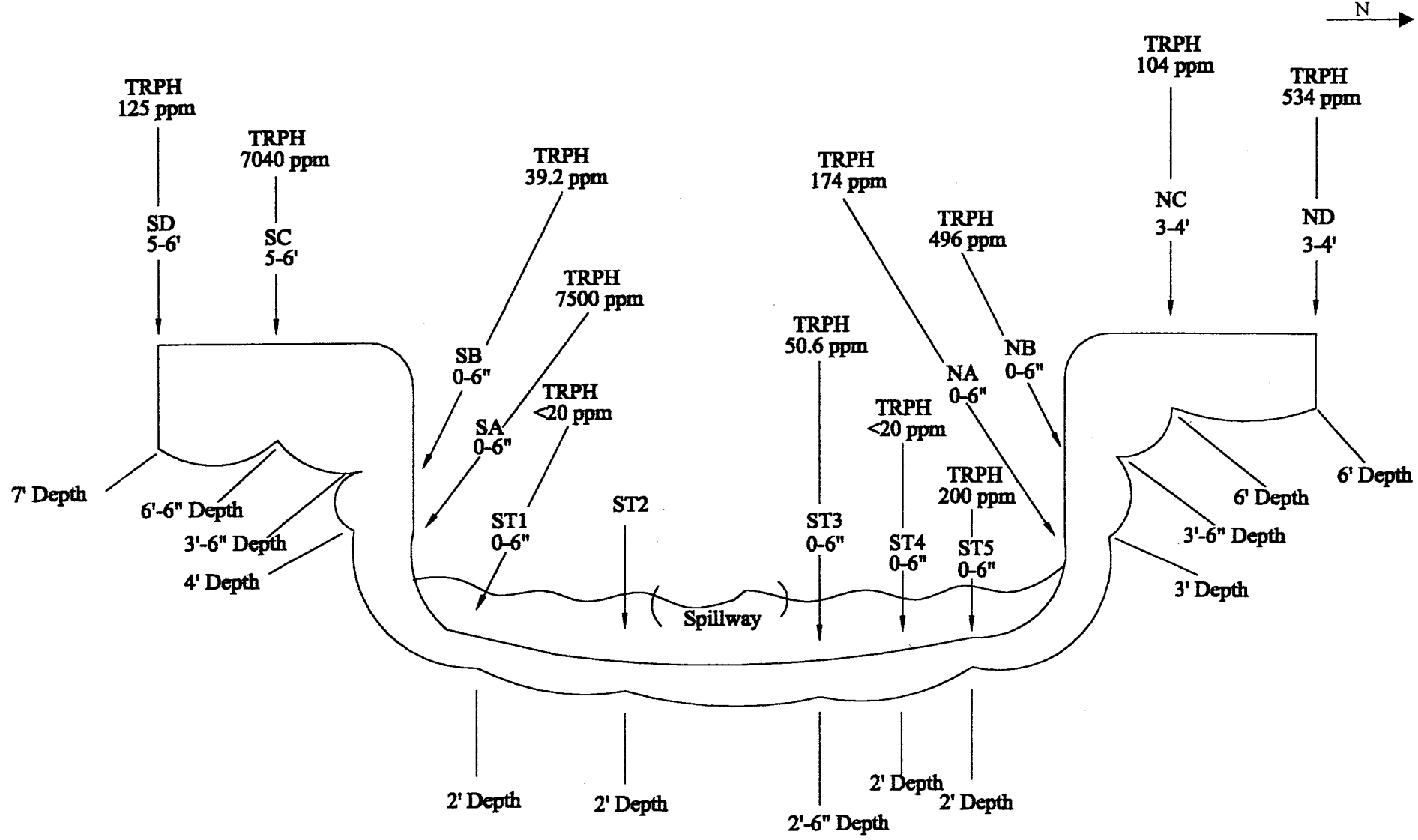
Transect #3 Cross Section

DRAWN	CHECKED	APPROVED	DATE	SCALE
SG	JG	JG	4/27/00	None

FILE 4568 LAYERS None

FIGURE NO 4

REV.



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Lower Mahoning River
(Pennsylvania)
Environmental Dredging
Reconnaissance Study

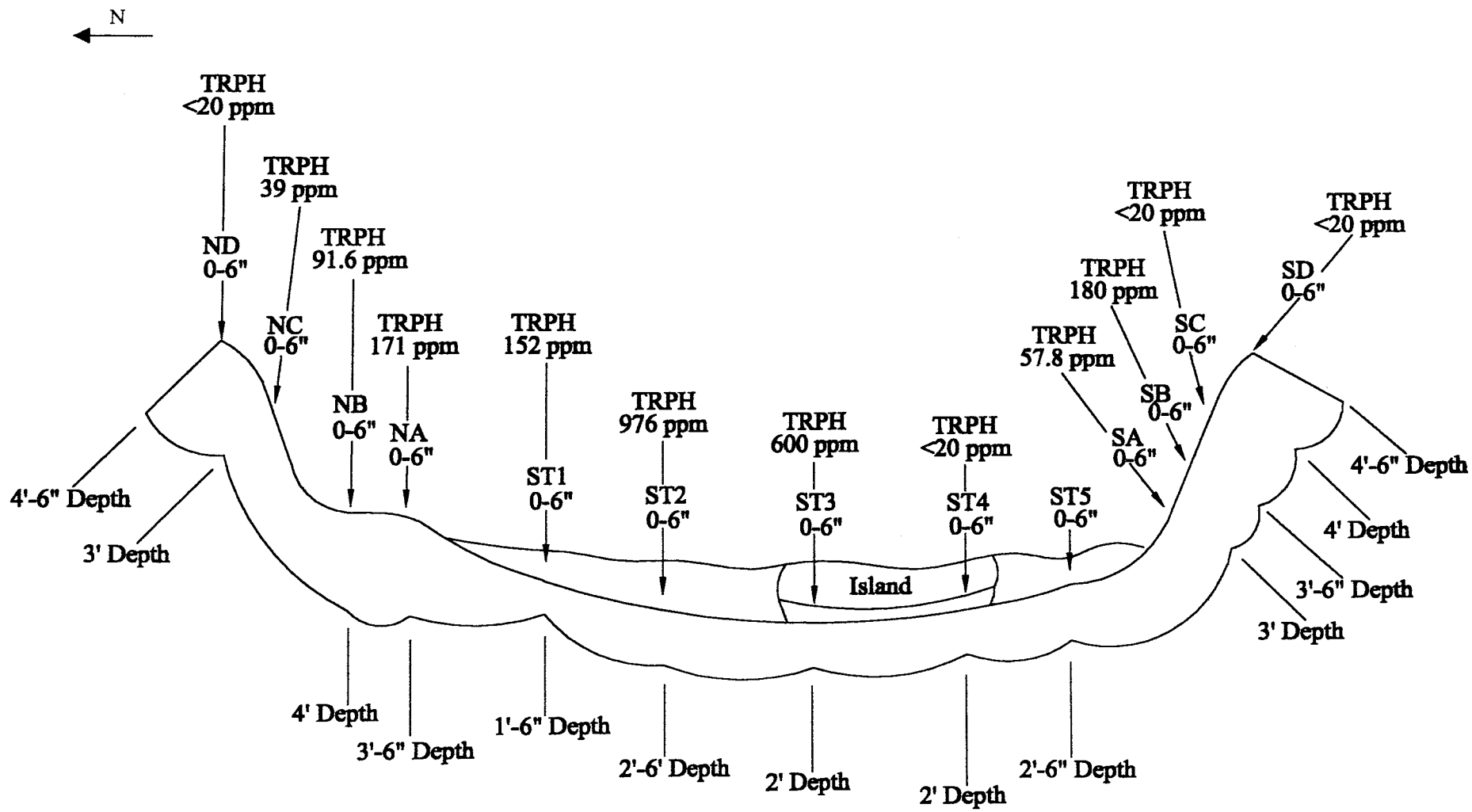
Transect #4 Cross Section

DRAWN	CHECKED	APPROVED	DATE	SCALE
SG	JG	JG	4/27/00	None

FILE 4568 LAYERS None

FIGURE NO 5

REV.



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740-574-6144

Lower Mahoning River
(Pennsylvania)
Environmental Dredging
Reconnaissance Study

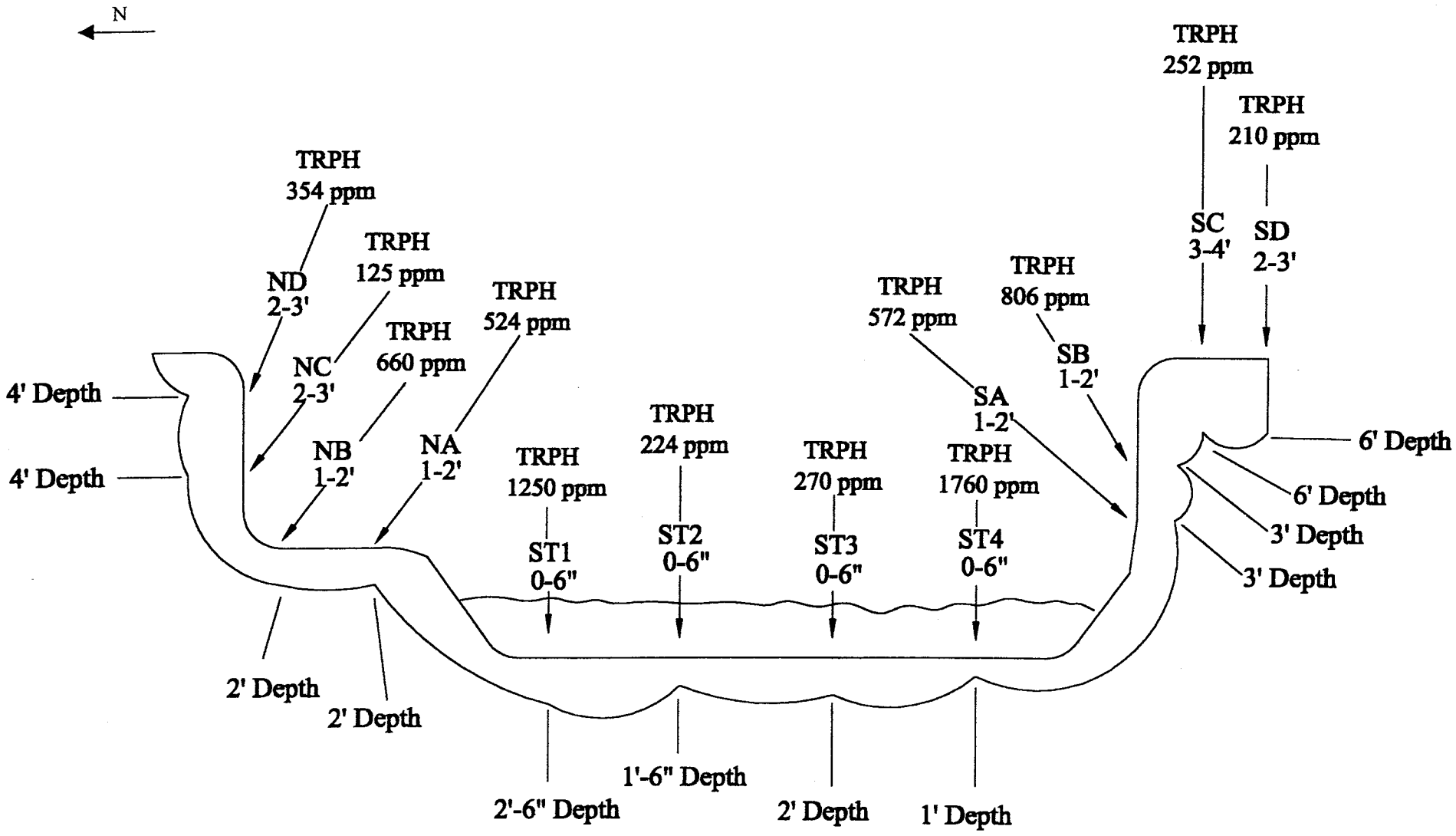
Transect #5 Cross Section

DRAWN	CHECKED	APPROVED	DATE	SCALE
SG	JG	JG	4/27/00	None

FILE 4568 LAYERS None

FIGURE NO 6

REV.



WasteTron, Inc.
8520 Ohio River Road; Suite E
Wheelersburg, Ohio 45694
740-574-6144

Lower Mahoning River
(Pennsylvania)
Environmental Dredging
Reconnaissance Study

Transect #6 Cross Section

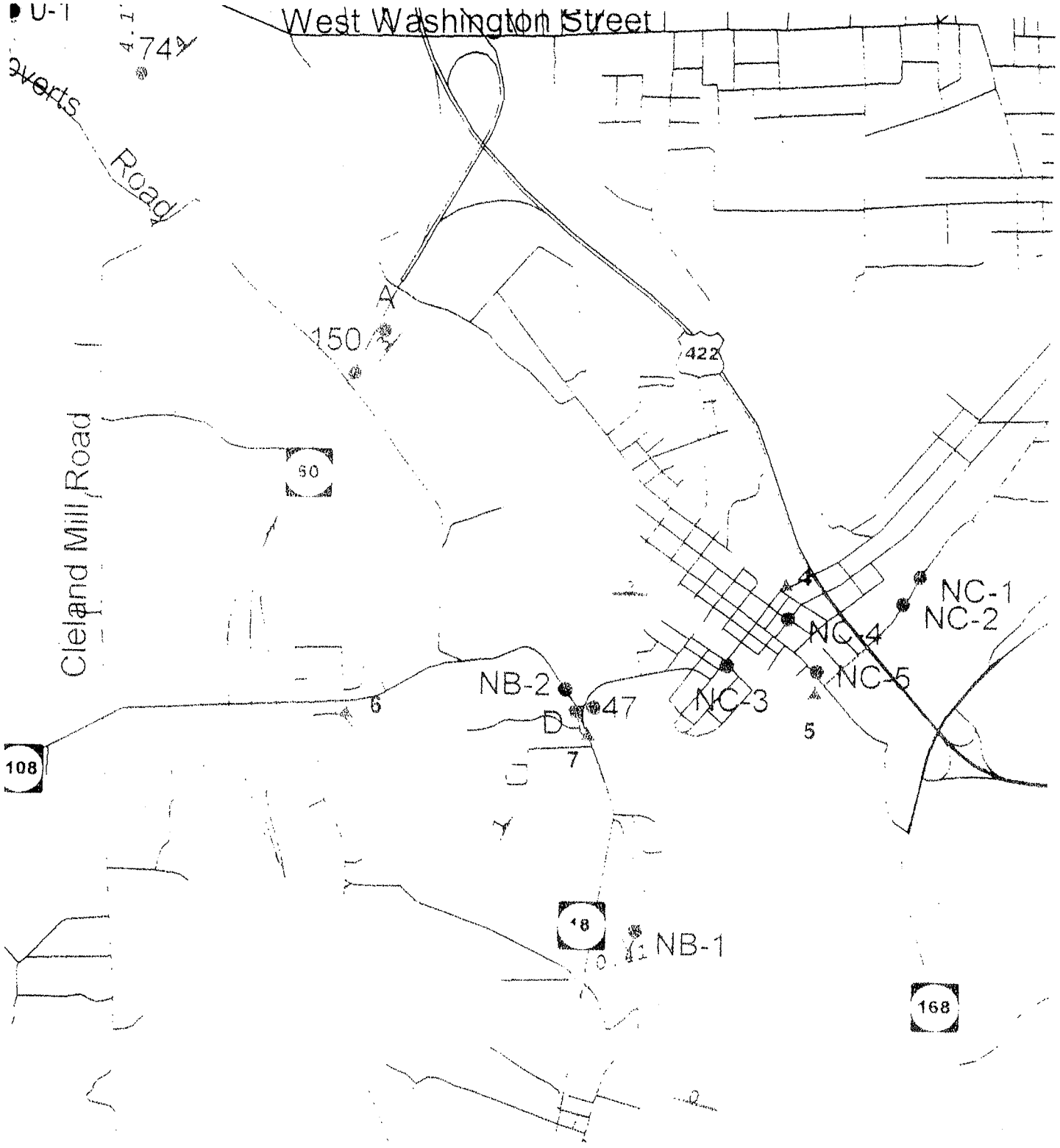
DRAWN	CHECKED	APPROVED	DATE	SCALE
SG	JG	JG	4/27/00	None

FILE 4568 LAYERS None

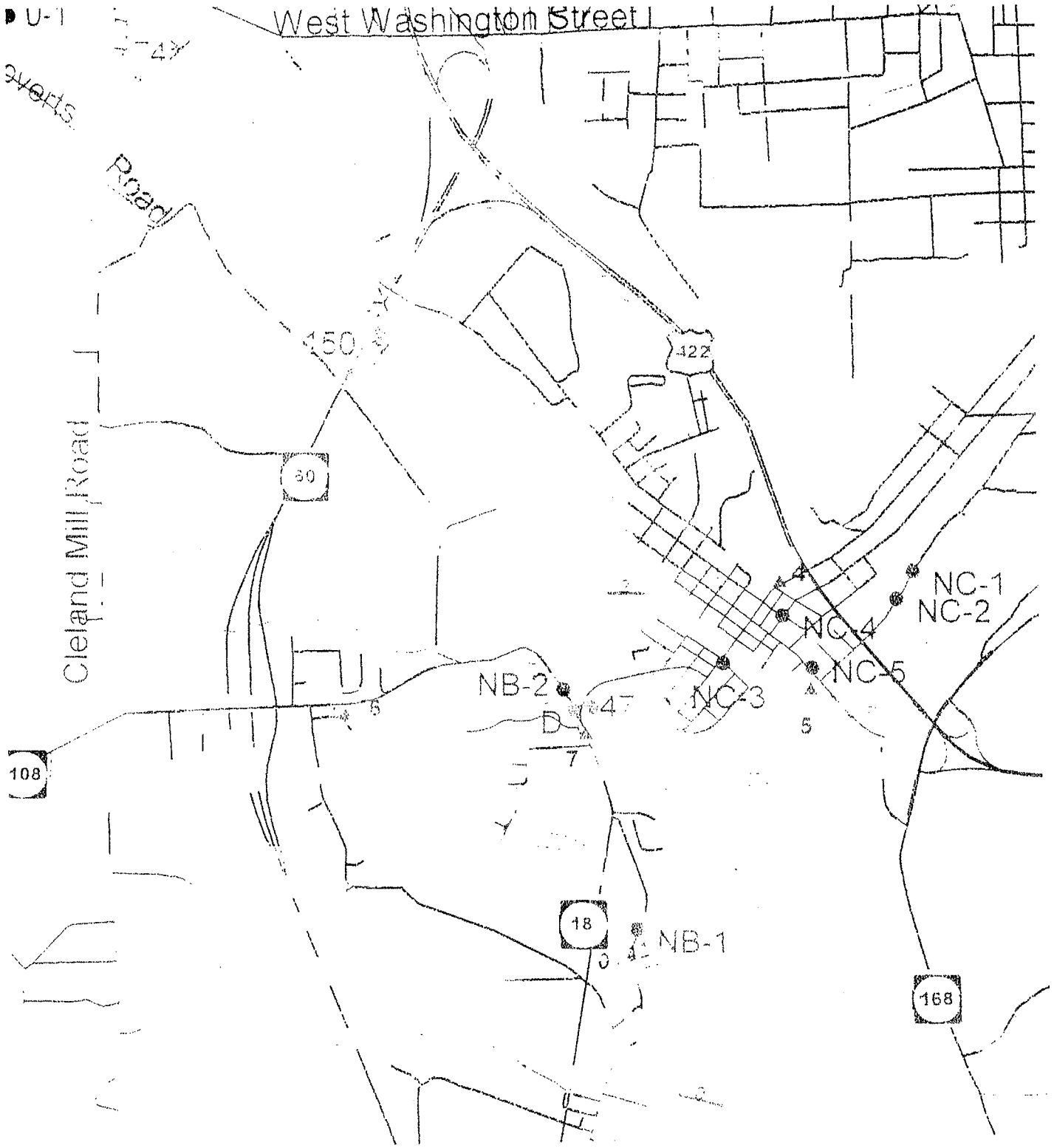
FIGURE NO 7

REV.

APPENDIX E DREDGING AND EXCAVATION DATA



Estimated quantity of contaminated sediments in river	Estimated quantity of contaminated sediments in bank
Approx 5' width of river along banks x 2 (average based on field screening and analytical in river) Approx 6" thick (average based on TRPH analytical) Approx 1.7 miles (River Mile 1.7 to River Mile 0)	Approx 7' width of banksx2 (both sides of bank) (average of plateau and vertical bank lengths) Approx 1' thick (average based on TRPH analytical and field screening readings) Approx 1.7 miles (River Mile 1.7 to River Mile 0)
1,660 cubic yards	4,650 cubic yards



Estimated quantity of contaminated sediments in river
Approx 10' width along banks x 2 (average based on TRPH analytical in river)
Approx 6" thick (average based on TRPH analytical)

Approx 2.5 miles (River Mile 4.2 to River Mile 1.7)

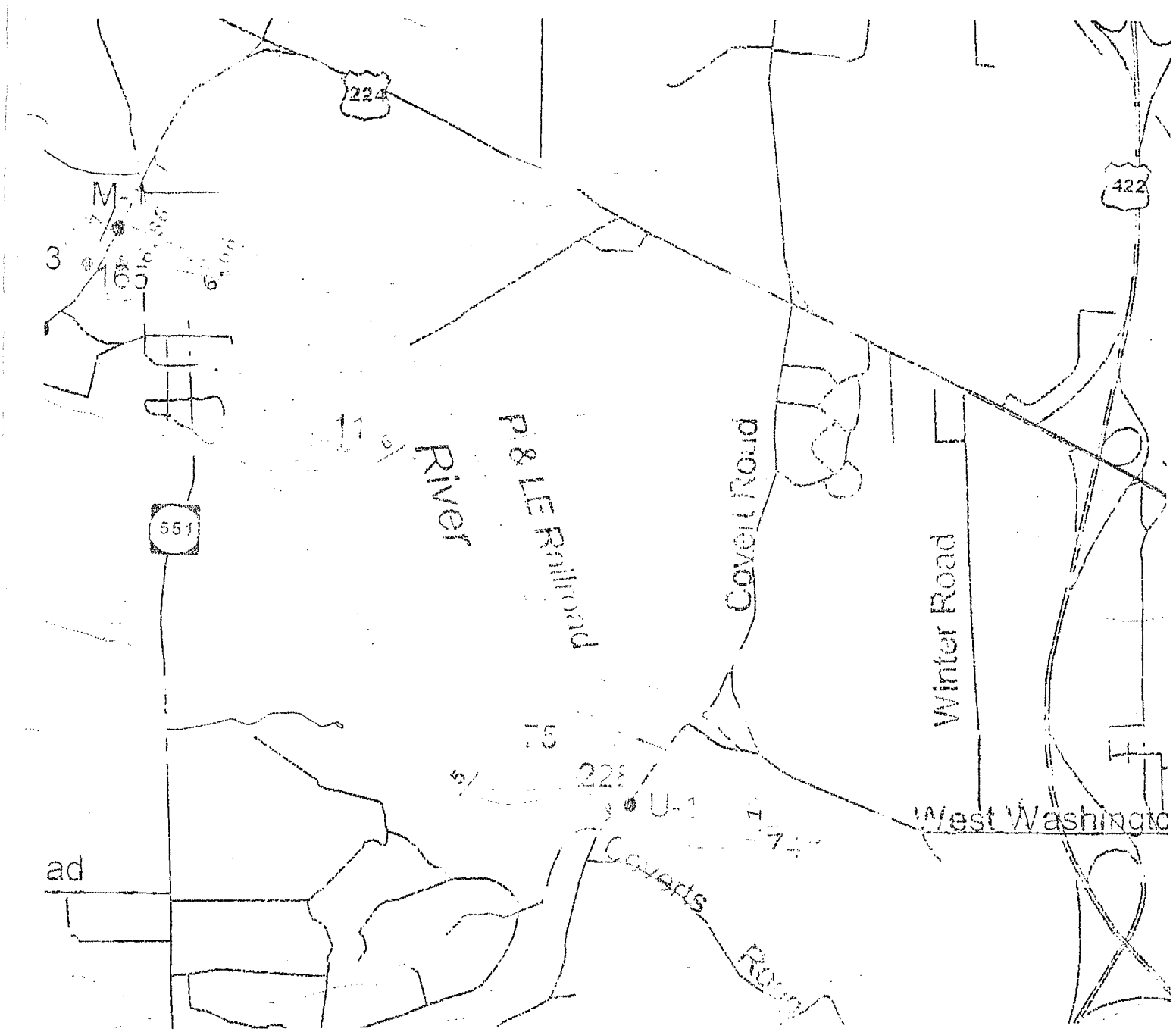
4,890 cubic yards

+ island zone (2.5' on each side based on field screening and analytical X 250' length of island X 1' deep based on field screening and analytical) 50 cubic yards

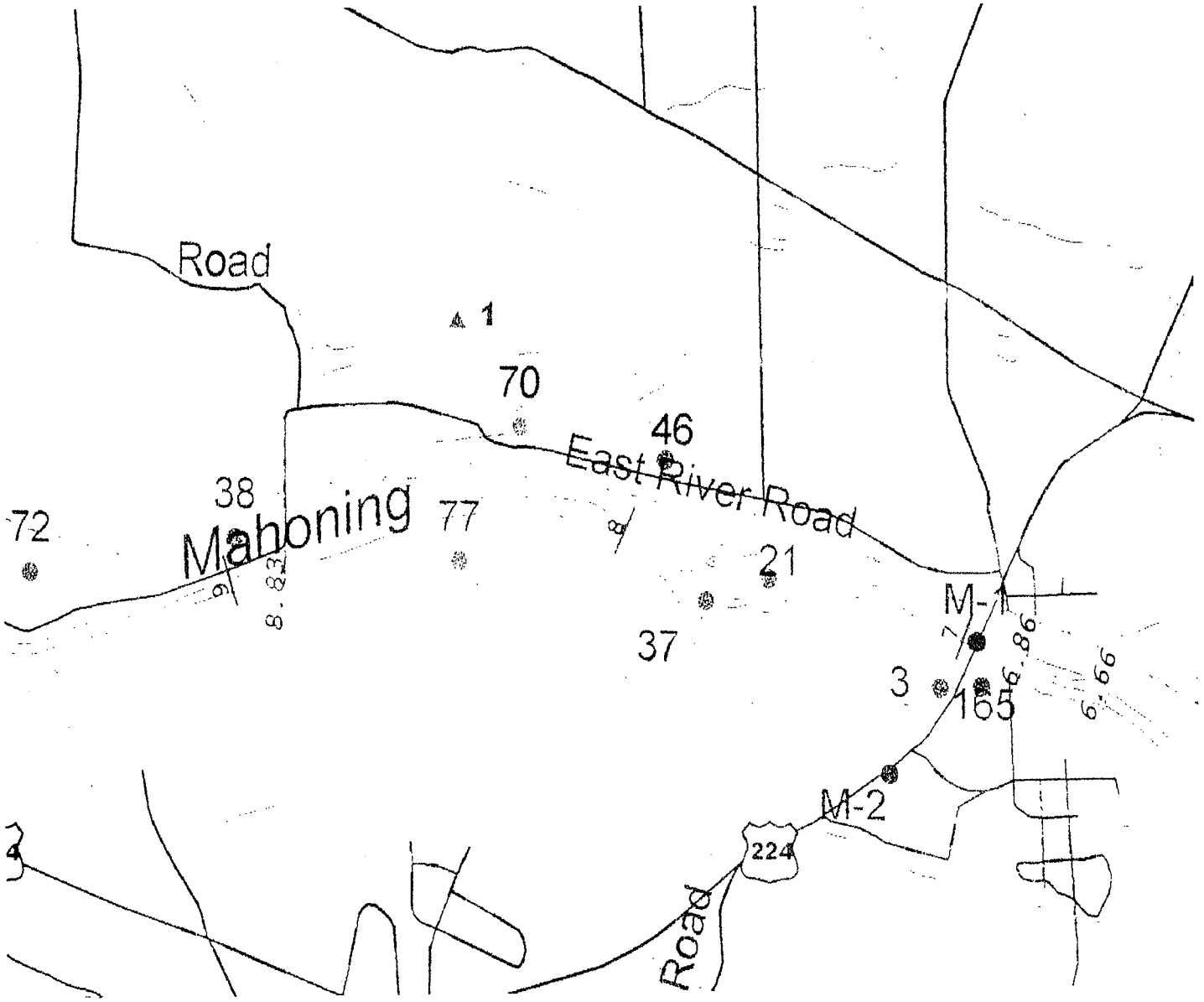
4,940 cubic yards

Estimated quantity of contaminated sediments in bank
Approx 7' width of banksx2 (both sides of bank) (average of plateau and vertical bank lengths)
Approx 1.3' thick (average based on TRPH analytical and field screening readings)
Approx 2.5 miles (River Mile 4.2 to River Mile 1.7)

8,900 cubic yards



Estimated quantity of contaminated sediments in river	Estimated quantity of contaminated sediments in bank
Approx 5' width along banks x2 (average of area based on field screening and analytical) Approx 6" thick (average based on TRPH analytical) Approx 2.7 miles (River Mile 6.9 to River Mile 4.2)	Approx 5' width of banksx2 (both sides of bank) (average of plateau and vertical bank lengths) Approx 2.5' thick (average based on TRPH analytical and field screening readings) Approx 2.7 miles (River Mile 6.9 to River Mile 4.2)
2,640 cubic yards	13,200 cubic yards
+ island zone (2.5' on each side-based on field screening and analytical X 750' length of island X 1' deep based on field screening and analytical) 140 cubic yards	
2,780 cubic yards	



Estimated quantity of contaminated sediments in river
Approx 160' width of river (average)

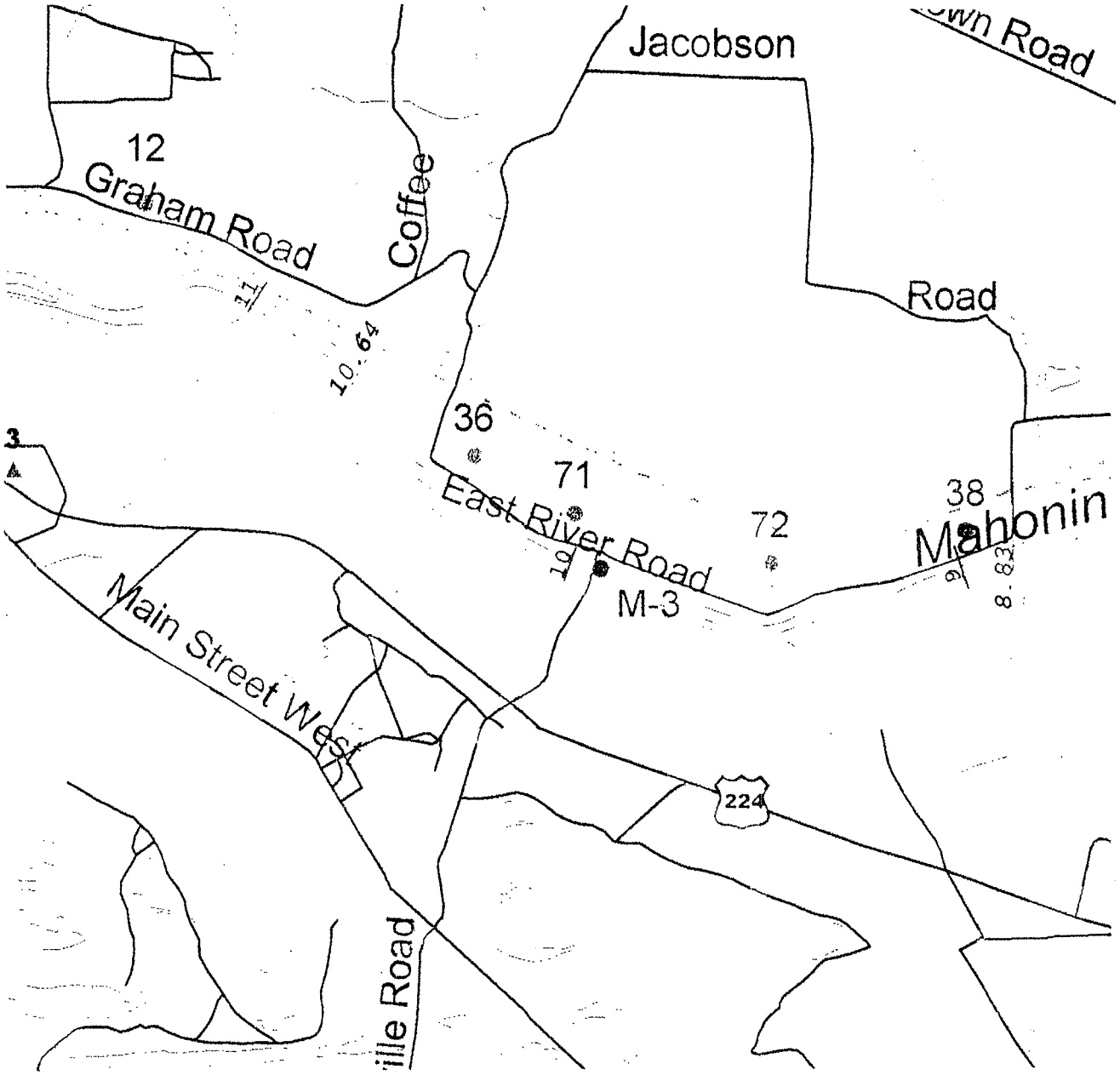
Approx 6" thick (average based on TRPH analytical)

Approx 1.9 miles (River Mile 8.8 to River Mile 6.9)

29,720 cubic yards

Estimated quantity of contaminated sediments in bank
Approx 5' width of banksx2 (both sides of bank)
(average of plateau and vertical bank lengths)
Approx 2' thick (average based on TRPH analytical and field screening readings)
Approx 1.9 miles (River Mile 8.8 to River Mile 6.9)

7,430 cubic yards



Estimated quantity of contaminated sediments in river
Approx 150' width of river (average)

Approx 6" thick (average based on TRPH analytical)

Approx 3.2 miles (Penn/Ohio border to River Mile 8.8)

46,930 cubic yards

Estimated quantity of contaminated sediments in bank
Approx 5' width of banksx2 (both sides of bank)
(average of plateau and vertical bank lengths)
Approx 3' thick (average based on TRPH analytical and field screening readings)
Approx 3.2 miles (Penn/Ohio border to River Mile 8.8)

18,770 cubic yards

APPENDIX H BORING LOGS

pH 7.4 Background PID 4

BORING LOG

WasteTron, Inc.

Red cap - bottom
Black - top

PAGE ___ OF ___

PROJECT NAME AND LOCATION: Lower Mahoning River Dredging Study		PROJECT NUMBER: 4568	BORING NO.: RT1-ST1
DRILLING COMPANY	DRILLER: Nosh/Kieth	DATE AND TIME STARTED: 11-15-99 10:30A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES: 3
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: Cloudy TEMP: 45°F	PROJECT MANAGER

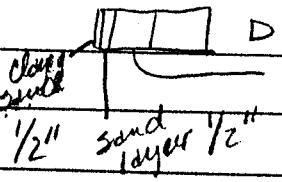
DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						Water Depth ~1'								
						2" Sampler								
0-1'		A		5"		Dk Brown w/ Black specs		20	70	10		Loose		51
1-2'		B		4"		Well-Graded (assorted sand sizes)								
2-3'		C		3"		~~Sand w/ Gravel~~ (no apparent layers just a jumble!)								
						Refusal @ 2.5'								
						Poor Recovery		15	55 ~~60~~	20				
				1-2'		Brown, Clayey Sand w/ Gravel, Wet (somewhat co-hesive)								7
				2-2.5'		Same somewhat drier than 1-2' sample								9
						Gravels are round/subround								
									TRPH					
						Staking sampling point in case we need more sample.								

WasteTron, Inc.

BORING LOG

PAGE ___ OF ___

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RT1-ST2
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 11:00A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		D/F		6"/5"		Dk Brown, Well Graded Sand		20	75	5				33/27
1-2'		E/G		4"/2"		w/ Gravel, bottom								
						 F liner has thinner sand layer @ bottom w/ clayey sand layer							
					1-2'	Brown, Clayey sand Trace Gravel, Wet - on top ~~Less wet - near bottom~~		5	70	15-25				6/9
						more cohesive near bottom - impermeable layer ?!?								
						Refusal @ 1.5'								
						Moving over 2' + resampling to see if we can go deeper.								
						About same recovery + depth! Hitting layer gravel or very dense clay! Sampler not moving! Staked point								

pH 7.2

WasteTron, Inc.

BORING LOG

PAGE ___ OF ___

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RT1-ST3
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 11.30A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water - 3'

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		H/K		4"/6"		Brown, multi-colored sand w sample also Well Graded Sand w/ Gravel (almost no fines!)		10	85	5				Compost 88
1-2'		I/L		4"/3"		Same / bottom 2" clayey sand I		0	70	30				Compost
2-3'		H		2"		looks like material swept back in hole!								
						Vertical Profile Sample 0-6"								
						Refusal @ 2' Moved over 1' + resampled Refusal @ 1.75'!								

WasteTron, Inc.

BORING LOG

Scour bank side (inside meander) PAGE ___ OF ___

PROJECT NAME AND LOCATION: bank eroded vertically @ tree line		PROJECT NUMBER	BORING NO. RT1-ST4
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 12:00P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water - 3.5'

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		M		4"		Brown w/Black flecs, Sand w/ Gravel, no layers! Few Fines		10	90					42
						~~Bottom 1" clayey sand~~		10	60	30				
1-2'		N		5"		Clayey Sand, Few-Little Gravel, Wet (top 2" fall out from top?)								10
2-3'		O		3"		less damp/little more cohesive!								7

TRPH

S ST4 ST3 ST2 ST1 N

No odor + discoloration noted in any of these samples!

Refusal @ 2.5'

North West
South - East

BORING LOG

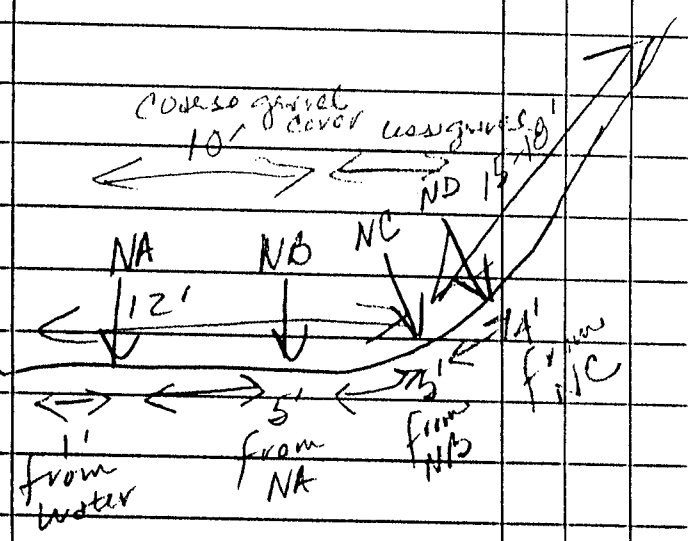
WasteTron, Inc.

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. GTI-NA
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 12:30P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

2" Sampler

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						Area covered w/ coarse gravel!								
0-1'		A/C		16"/6"		Dk Brown, Sand w/ Gravel Trace-Few Fines		20	70	10				91
1-2'		B/D		5"/3"		Lg gravel caught in sampler end!								10
						Same								
									TRPH					



Refusal @ 1.5'

Moved over 1' + resampled. Refused @ 1.5' Still!

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. GT1-N13
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 1:00P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		E		5'		Brown, Silty Gravel w/ Sand	/	40	40	15	20			22
						Silty Sand w/ Gravel.	/							
1-2'		F		4'		Same Gravel-round/sub-round.								9
						no distinct layers noted								
							TRPH							
						Refusal @ 1.5'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BTI - MC
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 1:30P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	G		8"		Dk Brown, Silty Sand w/ Gravel, Few Clay Trace organics		15	65	30				42
1	2'	H		7"		Lg gravel caught in end of sampler → Same								17
2	3'	I		0										
								TRPH						
						Refusal @ 2'								
						Material is too coarse!								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT1-HD
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 2:00P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

ESP Sampler

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'		J/L		2'		DK Brown, Clayey Silt w/			50	50			0-2	39
						Sand, organic (roots), Wet-Damp							6-12'	27
3-6'		K/M		0		1.5'							18-24"	13
						Silty Sand w/ Gravel Wet		15	60	25				

TRPH

Refusal @ 3'

Moved over 1' & resampled. Still refusal @ 3'

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT1-SA
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 2:30P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						[illegible] full-line @ bank								
0-3'		N/P		2.5'/2.5'		Brown, Sandy Silty Clay / Sandy Clayey Silt organics, Damp small gravel, vertical seams along small roots		5	30	65			0-6"	57
3-6'		O/Q		1"/2"		Hitting something hard, gravel or root? same							6-12"	34
													12-18"	22
													18-24"	24
													24-30"	13
						TRPH								
						Refusal @ 3'								
						Moved 3' over (no-[illegible] [illegible])								
						Advanced to 3.5' / poor recovery								

WasteTron, Inc.

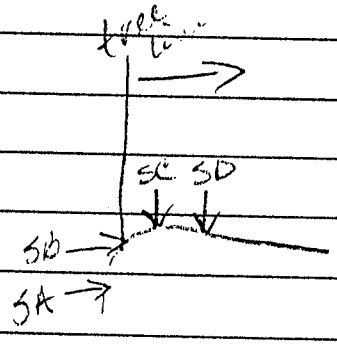
BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT1 - SB
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 3:00P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: Monday TEMP: 50°F	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						at tree line								
0-3'		R		20"		Brown, Sandy clayey silt			40	60			0-6	62
						organics (3 - 1/4" roots in sample)					Damp		6-12"	22
													12-20"	13

TRPH



Refusal @ 2.5'

Hitting roots!

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BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION	
DRILLING COMPANY / DRILLER	PROJECT NUMBER / BORING NO. BT1-S1
DRILLING EQUIPMENT AND METHOD	DATE AND TIME STARTED 3:30P / DATE AND TIME COMPLETED
SIZE AND TYPE OF BIT / DRILLING FLUID	COMPLETION DEPTH / TOTAL NUMBER OF SAMPLES
SAMPLING HAMMER	FIELD INSTRUMENTATION
TYPE: / DRIVING WT.	WEATHER: / TEMP: / PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'		S		2.5'		Brown Sandy Silty Clay, Organics, Trace Gravel		5	40	55			0-6"	36
3-6'		T		8"		Same, less organics							6-12"	17
						Bottom 1.5" Stiff clay							18-24"	12
													3-4'	13
							TRPH							
						Refusal @ 4'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BH1-SD
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 4:00P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER			
TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'	U		31			Brown Sandy Silty Clay		5	35	60			0-6"	47
													6-12"	14
3-6'	✓		10"										12-18"	7
													24-30"	11
													3-4'	15
						TRPH								
						Refusal @ 4'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RT2-ST1
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 11-17-99	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH 7:15A	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water 2'

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		A		8"		Blackish, Silty Sand, Trace-		5	75	20				94
1-2'		B		7"		Few Gravel (metallic, mica looking particles in sample) Same								57
2-3'		C		6"		2" Top 3" fallout from above								36
3-4'		D		4"		Bottom Clayey Sand, Trace Gravel		5	60	35				29
4-5'		E		0		Bottom of D is getting stiffer, more cohesive.								

TRPH

Refusal @ 4'

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION	
PROJECT NUMBER	BORING NO. RT2-ST2
DRILLING COMPANY	DRILLER
DATE AND TIME STARTED 7:35A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD	
COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID
FIELD INSTRUMENTATION	
SAMPLING HAMMER	
TYPE:	DRIVING WT.
WEATHER: Cloudy	TEMP:
PROJECT MANAGER	

Water 3'

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		F		5"		Blackish, Silty Sand			85	15				74
1-2'		G		4"		DK Brown, Clayey Sand, Trace Gravel, Wet-Damp		5	70	25				12
2-3'		H		4"		Cohesive Clay! Few Gravel		10	40	50				9
3-4'		I		2"		Same								12
						Refusal @ 3.5'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RTZ-ST3
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 7:55A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						Water 3.5' 2' from island								
0-1'		J		6"		Brownish Black, Silty Sand very fine sand			75 80	15-20				19
1-2'		K		6"		Bottom 2" Clayey sand w/ gravel		5	60	35				7
2-3'		L		0"										
						TRPH								
						Refusal @ 2'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. AT2-S14
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water 2'

DEPTH/FEET	SAMPLES: ELEVATION	SAMPLES: TYPE AND NUMBER	SAMPLES: INTERVAL	SAMPLES: RECOVERY	SAMPLES: BLOW COUNT	DESCRIPTION 1' from island	USCS SYMBOL	ESTIMATED PERCENT OF: GR	ESTIMATED PERCENT OF: SA	ESTIMATED PERCENT OF: FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	M		8"		Blackish, Silty Sand			80	20				142
1	2'	N		6"		bottom top 4" silty sand 2" Clayey sand (lighter [illegible])			65	35				[illegible] 32
2	3'	O		4"		bottom 1" stiffer, [illegible]								7
3	4'	P		0		3" of fallout - [illegible]								
						Vertical Profile								
						Refusal @ 3'								

WasteTron, Inc.

BORING LOG

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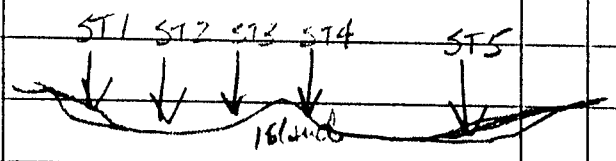
PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RT2-ST5
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 8:45A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water 2'

DEPTH/FEET	SAMPLES ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	Q		6"		Dk Brown/Black Silty Sand metallic flecks, fine sand						TRPH		42
1-2'		R		5"										12
2	3'	S		6"		Bottom 2" sandy clay/clayey sand								9
3	4'	T		2"		same								10



Refusal @ 3.5'

WasteTron, Inc.

BORING LOG

Red Cedar

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BTZ-SA
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 9:00A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		A		7"		Dk Brown, Silt w/ Sand, Organics-blackish, Wet (rotting leaves)			40	60				192
1-2'		B		8"		Top 2" silt w/ sand Dk Brown, Silty Sand, Few Gravel			70	30				99
2-3'		C		6"		Same								14
3-4'		D		2"		Lg gravel in sample		15	60	25				15
						Vertical Profile Sample								
						Refusal @ 3.5'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT2-SB
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 9:15	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		E		12"		Dk Brown, Silt w/ Sand organics, Wet			30	70			0-6	151
													6-12"	33
1-2'		F		8"		1.5' Sandy Silt, Little Gravel			40	60			1-2'	16
													2-3'	17
2-3'		G		7"		Silty Sand w/ Gravel, Wet Lg gravels in sample!		10	50	40				
3-4'		H		0										
						Refusal @ 3'								

TRPH

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT2-SC
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 9:30A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						Sparse grass cover								
0-3'		I		2.5'		1" Topsoil type material Brown, Sandy Silt w/ Clay organics							8-6	14
													12-18"	24
3-6'		J		6"		Material gradually getting more Sand + gravel (no defined layering though)							24-30"	12
													34	9
						TRPH								
						Refusal @ 4'								

WasteTron, Inc.

BORING LOG

5A 5B 5C 5D

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT2-5D
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 9:45A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						Grass cover 8' from river								
0-3'		K		2.5'		~~Dk Brown~~, Topsoil 1"								
						Dk Brown, Sandy Silt w/ Clay, Damp							0-6"	62
						~~iron staining present in sample~~		40	60				12-18"	12
3-6'		L		10"									24-30"	14
						bottom top								
						Sandy silt w/ clay								
						Brown								
				3"		2" fine sand, Damp-Wet								
						Well Graded Sand w/ Gravel, Wet								?
						TRPH								
						Recovery @ 4'								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BTZ-NA
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 10:00A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'		M		2'		Dk Brown, Silty Sand w/ Gravel, Wet							0-6"	22
						Gravels - rounded/subrounded							6-12"	10
3-6'		N		0									12-18"	9
													18-24"	11
						TPTH								
						Refusal @ 3'								

WasteTron, Inc.

BORING LOG

NA NB NC ND

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BTZ - NB
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 10:15A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	3'	O		2.5'		Dk Brown, Sandy Silt w/ Gravel		10	40	50			0-6	52
						1.5' [illegible] Wet								
						Dk Brown Silty Sand w/ Gravel, Wet							12-18	10
3	6'	P		3"		[illegible] Fine gravel		10	50	40			24-30	17
								5	60	35				
													3-4	9
						TFA								
						Refusal @ 3.5'								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO.
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	A		5'		[illegible]		15	[illegible]	[illegible]				[illegible]
1	[illegible]	B		[illegible]		[illegible]			[illegible]		[illegible]			[illegible]
2	[illegible]	C		[illegible]					[illegible]	[illegible]				
						TMH								
						[illegible]								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO.
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 9 15 A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION (in front of island)	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		D		9"		Brown, Silty Sand			80	20				(47)
1-2'		E		7"		less fines			90	10				9
2-3'		F		5"		w/ Gravel		10	80	10				11
3-4'		G		2"		Clay sand, globs			90	30				14
						Refusal @ 3.5'								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RT3 - ST3
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 9 30 A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water 3.5'

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	H		5"		Blackish/Brown Speckled Sand w/ Silt + Gravel		15	70	15				21
1	2'	I		4"		more coarse		20	70	10				17
2	3'	J		3"		Sandy Clay globs, cohesive clumps								19
						Refusal @ 2.5'								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT3-ST4
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 7 15A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						1' from island								
						Pudding-like ?								
0-1'		K		9"		Blackish, Silty Sand, Few Gravel (fine sand)			60	40				32 7
1-2'		L		8"		less fines, trace gravel		5	80	15				27
2-3'		M		6"		Silty Sand w/ Gravel		15	70	15				13
3-4'		N		0		3" outfall - discard								
						TRPH								
						Refusal @ 3'								

BORING LOG

WasteTron, Inc.

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. KTS-275
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 10:00 A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water 2.5'

DEPTH/FEET	SAMPLES ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		D		5"		Blackish Gray, Silty Sand W/ Gravel		15	70	15				31
1-2'		D		4"		Less fines (Gravel Sprinkled in Sand)		15	75	10				20
2-3'		D		1"		Clayey Sand (chunks)			70	30				—
						TRPH								
						Refusal @ 2.5'								

WasteTron, Inc.

BORING LOG

SA SB SC SD

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT3-SA
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 10 20 A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	SAMPLES: TYPE AND NUMBER	SAMPLES: INTERVAL	SAMPLES: RECOVERY	SAMPLES: BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	ESTIMATED PERCENT OF: SA	ESTIMATED PERCENT OF: FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						Kind of sheen near bank - river interface!								
0-1'		A		7"		Brown, Silty Sand w/ Gravel		15	70	15		TRPH		77
						Gravel - round/subround iron staining present								
1-2'		B		6"		Same small black horizontal seams in sample.								31
2-3'		C		6"		Same no black seams								20
3-4'		D		4"		Less fines/less gravel/lg gravel through		10	80	10				7
4-5'		E		0										
						TRPH								
						Refusal @ 4'								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT3-5B
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 10:40 A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

4' from river

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	F		8"		Brown w/ rust seams, Silty Sand w/ Gravel		15	65	20				35
1	2'	G		6"										15
2	3'	H		5"		Less gravel + fines		10	80	10				9
3	4'	I		5"		Bottom 2" very fine sand layer/[illegible]			90	10				
4	5'	J		0										
						TRPH								
						Refusal @ 4'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. UT3-SC
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 11:00A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		K		10"		Dk Brown, Sandy Silt organics, Damp/Wet			40	60				62
1-2'		L		10"		fine grained sand		[illegible]	[illegible]					14
2-3'		M		9"		less organics/fewer gravel		5	40	[illegible]				12
3-4'		N		7"		less clay/fines		5	15	80				11
4-5'		O		6"		more sandy/coarser		5	50	45				9
5-6'		P		4"		more gravel		10	40	45				11
6-7'		Q		2"		Outfall - Drained								
						No defined layers/gradually changing								
						Refusal @ 6'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT3-SD
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 11.20A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	SAMPLES: TYPE AND NUMBER	SAMPLES: INTERVAL	SAMPLES: RECOVERY	SAMPLES: BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'		S		2.5'		Brown, Sandy Silty Clay, Tr[illegible] Gravel, organics		5	40	55			0-6	133
													6-[illegible]	71
3-6'		T		2.5'		2' Less organics, few gravel							8-[illegible]	16
						3' Silty clay w/ sand							3-3.5'	9
						4' Silty clayey sand, Few gravel							4-4.5'	7
						5' w/ gravel							5-5.5'	11
						TRPH								
						Refusal @ 5.5'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. [illegible] - NA
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 11:35 A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	SAMPLES: TYPE AND NUMBER	SAMPLES: INTERVAL	SAMPLES: RECOVERY	SAMPLES: BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'		U		2'		Brown, Sandy Silt (Sheen near water/bank interface)			40	60		0-6		(274)
												6-12"		79
3-6'		V		12"		1' Silty Sand w/ Gravel						18-24"		32
								15	60	25				
												3-4'		12
						B.O.B @ 4'								
						TRH								
						Refusal @ 4'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. [illegible] - NB
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 11:45A	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'		W		2'		Brown, Sandy Silt, Fine Gravel, Damp/Wet			40	60		0-6"		31'
												6-12"		35
3-6'		X		2'		Silty Sand w/ Gravel		15	60	25		18-24"		98
												3-4'		12
						Lg gravel near bottom of B.O.B @ 5'	Sample 1					4	5'	17
						TRPH								
						Refusal @ 5'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. B13-NC
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 12 00P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'		Y		2.5'		Brown, Silty Sandy Clay Organics			35	65		0-6"		13
												6-12"		42
3-6'		Z		2'		1' Darker in color						18-24"		23
						2' Odor present						24-30"		147
												3-4'		33
						4' more sandy			45	55		4-5'		19
						4-5' lg gravels in sample								
						BOB @ 5'								
						TRPH								
						Refusal @ 5'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. B13-ND
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 12:30P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'		AA		3'		Brown, Silty Sandy Clay organics			40	60		0-6"		33
												6-12"		19
3-6'		BB		2.5'		1-4' Darker in color, musty odor						18-24"		64
												30-36		75
6-9'		CC		2"										
												3-4'		72
						4' More sandy/less gravel		5	45	50		4-5'		66
												5-6'		25
						TRPH								
						Refusal @ 6'								

WasteTron, Inc.

BORING LOG

11-12-90

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. MT-1-011
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 1:30 P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water 3.5'

DEPTH/FEET	SAMPLES ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	A		5"		Petroleum Black/Brown Well graded sand w/ Silt + Gravel		10	80	10				72
1	2'	B		4"		Bottom 1.5" sand layer/ [illegible]		[illegible]	20	10				12
2	3'	C		4"		1 g gravels in sampler		5	75	10				9

TRPH

Refusal at 2'

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RT-F-512
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 1 50 P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water 2.5'

DEPTH/FEET	SAMPLES: ELEVATION	SAMPLES: TYPE AND NUMBER	SAMPLES: INTERVAL	SAMPLES: RECOVERY	SAMPLES: BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	D		4"		Peppered Black/Brown Well-Graded Sand w/ Silt-Gravel		10	80	10				20
1	2'	E		3"		Same								13
2	3'	F		1"		Very fine sand			90	10				—

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RT4-593
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 2:10P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water 1'

DEPTH/FEET	SAMPLES ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	G		4"		Brown, Well Graded Sand Gravel		25	70	5				21
1	2'	H		4"		Same								19
2	3'	I		3"		Same 1g gravel in sample								12
						TRIP								
						Refusal @ 2.5'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RT4 – ST4
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 2:30 P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water — 1'

DEPTH/FEET	SAMPLES: ELEVATION	SAMPLES: TYPE AND NUMBER	SAMPLES: INTERVAL	SAMPLES: RECOVERY	SAMPLES: BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	ESTIMATED PERCENT OF: SA	ESTIMATED PERCENT OF: FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		J		6"		Black/Brown peppered Silty Sand w/ Gravel		15	70	15				173
1-2'		K		4"										40
2-3'		L		4"		Same								19
						no distinct layers found								
						Vertical Profile / Landfill / Eliminate / Dioxin ?								
						Refusal @ 2'								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. [illegible] ST5
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 3-10-[illegible]	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

Water 1.5'

DEPTH/FEET	SAMPLES: ELEVATION	SAMPLES: TYPE AND NUMBER	SAMPLES: INTERVAL	SAMPLES: RECOVERY	SAMPLES: BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		M		4"		Pepper Black/Brown, [illegible] w/ gravel [illegible]		10	75	15				17.[illegible]
1-2'		N		3"		Same [illegible]								6
2-3'		O		1"		Well graded sand ([illegible])		0	95	5				—

TRPH

Refusal @ 3'

WasteTron, Inc.

BORING LOG

↑6'

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT4 - SA
DRILLING COMPANY	DRILLER K	DATE AND TIME STARTED 3:25 P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: [illegible] TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1	P		10"		0.5" Brown, Silt			20	80				740
						Black, Silty Clay, Wet			20	80				
1	2'	Q		12"		Slight sheen, oily odor								272
						Same								
						3.0 > Black [illegible]								197
3	4'	R		12"		3.5 Brown, more stiff, [illegible]		Wet	30	70		3.5	4'	46
4	5'	S				Not taken [illegible]								
						11-16-99 BOB @ 4'								
						0-6" Vertical Profile								
						Resampling to get more sample								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT4 - SB
DRILLING COMPANY	DRILLER N	DATE AND TIME STARTED 4 00 P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	S		11"		2" Brown silt			30	70		0 -	2"	42
						Black, Silty Clay, wet			30	70		2 -	6"	429
1	2'	T		12"		oily, sheen						6 -	12'	204
												12 -	18'	219
2	3'	U		12"		Black fading to brown Dry/Wet						18 -	24"	193
												2	[illegible]	11
3	3.5'	V		6"		Getting very hard to advance - pulling [illegible]								
						to check		5	35	60		2'	3'	69
												3 -	3.5'	36
						stiff, clay								
						BO Bar 3.5' 11-12-49								
						Check PID before [illegible]								
						TRIP								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT4-[illegible]
DRILLING COMPANY	DRILLER K	DATE AND TIME STARTED 4:15P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						Grass cover								
0	3'	W		2.5'		1-2' Topsoil Brown, silty clay, Dry			30	70		0	2'	63
						2'							3'	181
3	6	X		36'		Black, oily, smells like oil, Wet			30	70		3	4'	279
						Fading to brown last 3"						4	5'	314
6	9	Y		5'		Only advanced 1/2 foot (unfavorable limit)								
												5	6'	65.2
												6	8.5'	69
						Waiting on PE								
						TRPH								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT4-SD
DRILLING COMPANY	DRILLER N	DATE AND TIME STARTED 4 25 P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						Grass								
0-3'		Z		2.5'		2-3" Topsoil								
						Brown, Silty Clay, Trace		5	35	60				
3-6		NA		3'		Gravel, Damp								
						2.5' small sand seam 0.5" thick, horizontal			85	15				
6-9'		BB		12"		Lg gravels + sample		10	35	50				

	PID
0-6"	56 TRPH
6-12"	21
18-24"	27
24-30"	15
3-4'	21
4-5'	11
Refusal @ 7'	
5-6'	13
6-7'	15

WasteTron, Inc.

BORING LOG

2'

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT4-NA
DRILLING COMPANY	DRILLER K	DATE AND TIME STARTED 4:35P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'		CC		11"		0.5" Brown, Silt			20	80		0-6		47.3
						Black, Silty Clay, Wet			30	70		6-12"		46
1-2'		DD		12"		Oily, sheen, odor						12-18"		212
						1.5-2.5 Not as much sheen						18-24"		114
2-3'		EE		12"		2.5 Fading to Brown						2-2.5		92
						Bottom 3" Brown, Less Wet			40	60		2.5-2.8'		62
												2.8-3'		25
						Stopping!								
						TRPH								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT4-NB
DRILLING COMPANY	DRILLER N	DATE AND TIME STARTED 4:45	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	FF		11"		1" Brown, Silt			20	80		0	6"	372
						Black, Silty Clay, Wet			25	75		6	12"	262
1	2'	GG		12"		Black						1	2'	104
												2	3'	19
2	3'	HH		12"		Changing to Brown						3	3.5'	22
3	4'	II		7"		Stopped @ 3.5' / inferred limit								

TRPH

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. [illegible]
DRILLING COMPANY	DRILLER K	DATE AND TIME STARTED 5:00 P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						Sparse grass cover								
0	5'	JJ		[illegible]	5'	1" Topsoil Brown, Silty Clay			20	70		0	6"	[illegible]
						1'						[illegible]	[illegible]	31
3	6'	KK		3'		Black, Wet						17 18	18 [illegible]	[illegible]
												30	[illegible]	16[illegible]
						5.5' Turning Brown, Tan [illegible]		5	[illegible]	[illegible]		3	4'	[illegible]
						5.9' Brown (2")						4	[illegible]	18[illegible]
												5	[illegible]	[illegible]
						B.C.R. @ 6'						[illegible]	[illegible]	61
												5.[illegible]	6'	[illegible]
						TRPH								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO.
DRILLING COMPANY	DRILLER N	DATE AND TIME STARTED	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'		LL				[illegible]								
						[illegible]								
						[illegible]								
3-6'		MM												
						5' gravel, [illegible]								
						[illegible] 6'								
						PID								
						0-6" 76								
						6-12" 22								
						15-24" 17								
						2.5-3' 31								
						3-3.5' 26								
						4-5' 12								
						5-6' 17								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RTS-ST1
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED [illegible]	DATE AND TIME COMPLETED [illegible]
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP: [illegible]	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						[illegible] Water [illegible]								
0-1'		A/C		4"		Black [illegible] Gravel		[illegible]	15	[illegible]				17
1-2'		B/D		3"		[illegible] 1" of sample [illegible]								
									90	10				[illegible]
						Gravel [illegible]	[illegible]							
						Vertical [illegible]								
						Refusal [illegible]								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO.
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	E		4"		[illegible]								110
						[illegible]								
1	2'	F		3"		Sand								26
2	3	G		2"		[illegible]			35					14
						TPH								
						Refusal @ 2.0'								

WasteTron, Inc.

BORING LOG

11-17 [illegible]

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. [illegible]
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED [illegible]	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	SAMPLES: TYPE AND NUMBER	SAMPLES: INTERVAL	SAMPLES: RECOVERY	SAMPLES: BLOW COUNT	DESCRIPTION (Water at near island)	USCS SYMBOL	ESTIMATED PERCENT OF: GR	ESTIMATED PERCENT OF: SA	ESTIMATED PERCENT OF: FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	H/K		5"		Black, Silty sand			[illegible]	[illegible]				15
1	2'	I/L		3"		Bottom [illegible]			90	10				21
2	3'	J/M		0/2"		[illegible]								
						[illegible]								
						TRPH								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. [illegible]
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 1:30P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	N/S		5"		[illegible]								[illegible]
						1'								
1	2'	O/P		[illegible]		[illegible] fines								[illegible]
				[illegible]		[illegible]								
2	3'	P/S		0/12		[illegible]								—
						TRPH								
						[illegible]								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO.
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED 2:00P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	T		4"		Red Silty Sand			[illegible]	[illegible]				5
1-2'		U		3"		Bottom 1" dense sand [illegible]	[illegible]	[illegible]	[illegible]	[illegible]				4
2-3'		V		3"		Top 2" dense sand [illegible] clay [illegible]			[illegible]	[illegible]				17
						Refusal 2.5'								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. NA
DRILLING COMPANY	DRILLER N	DATE AND TIME STARTED 2:15P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	W		8"		[illegible]		15	60	25				41
						Gravel, [illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
1	2'	X		9"		[illegible]	[illegible]	[illegible]	70	15				39
						[illegible]								
2	3'	Y		6"		[illegible]	[illegible]							39
						[illegible]		20	[illegible]	[illegible]				
3	4'	Z		4"		Same								19
						Refusal @ 3.0'								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. [illegible]
DRILLING COMPANY	DRILLER K	DATE AND TIME STARTED [illegible]	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1"	AA		7"		Black, silty sand w/		15	55	30				57
						Green rolling leaves								
1	2'	BB		7"		less fine		[illegible]	[illegible]	[illegible]				21
						/								
2	3'	CC		5"		less fine		15	75	10				12
						/								
3	4'	DD		4"		same								4
						TRPH								
						Refusal @ 3.75'								

WasteTron, Inc.

BORING LOG

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PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. [illegible]
DRILLING COMPANY	DRILLER N	DATE AND TIME STARTED 2:45 P	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	3'	EE		[illegible]		0.5" [illegible]			20	80			[illegible]	14
						Black, [illegible]			10	60			[illegible]	13
3-6'		FF		12"		oily, odor						18	[illegible]	19
						2.5 [illegible]						50	[illegible]	11
						2.9 [illegible]						3-	3.5	11
						Same								
						B.O.B @ 4'								
						TPP								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO.
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
	3'													
3	6'	HP												

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO.
DRILLING COMPANY	DRILLER N	DATE AND TIME STARTED	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	[illegible]	[illegible]		10"		Light [illegible] 1"			[illegible]	[illegible]		0	[illegible]	[illegible]
						Dk Brown Silty [illegible]			30	70		6-	[illegible]	[illegible]
1	[illegible]	[illegible]		12"		[illegible]		10	30	60		1-	[illegible]	[illegible]
						/						[illegible]	[illegible]	[illegible]
	[illegible]			12"		Same								
						/								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO.
DRILLING COMPANY	DRILLER N	DATE AND TIME STARTED [illegible]	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	SAMPLES: TYPE AND NUMBER	SAMPLES: INTERVAL	SAMPLES: RECOVERY	SAMPLES: BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	ESTIMATED PERCENT OF: SA	ESTIMATED PERCENT OF: FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0	1'	LL				Light Brown, Silt (5")						0	6	15
						Dk Brown, Silty [illegible], Damp			10	6		6	[illegible]	[illegible]
1	2'	MM				Musty odor, organics						1	2'	19
						[illegible]		[illegible]	[illegible]	32		[illegible]	[illegible]	[illegible]
2	3'	NN				Same						3	[illegible]	24
3	4'	OO				Same								
						TRPH								

WasteTron, Inc.

BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO.
DRILLING COMPANY	DRILLER N	DATE AND TIME STARTED	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	SAMPLES: TYPE AND NUMBER	SAMPLES: INTERVAL	SAMPLES: RECOVERY	SAMPLES: BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	ESTIMATED PERCENT OF: SA	ESTIMATED PERCENT OF: FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
						Sparse grass cover								
0	B'	PP		3'		Brown, Silty [illegible]			40	60		0-6		32
						[illegible]						6-12"		14
3	C'	60		12"		Stone						1-2'		9
												2-3'		11
												3-4'		19
						Trip								
						[illegible]								

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BORING LOG

PAGE ____ OF ____

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO.
DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL NUMBER OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER			
TYPE:	DRIVING WT.	WEATHER: TEMP:	PROJECT MANAGER

DEPTH/FEET	SAMPLES: ELEVATION	TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF: GR	SA	FI	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'		KR				[illegible]						0-6	[illegible]	[illegible]
						[illegible]								15
3-6'		SS										1-2'		15
												2-3'		[illegible]
												3-4		11
												[illegible]		[illegible]
						TOPH								

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BORING LOG

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PAGE OF

PROJECT NAME AND LOCATION	PROJECT NUMBER
DRILLING COMPANY / DRILLER K	BORING NO. RT6-ST1
DRILLING EQUIPMENT AND METHOD	DATE/TIME STARTED 3:15 PM / DATE/TIME COMPLETED
SIZE AND TYPE OF BIT / DRILLING FLUID	COMPLETION DEPTH / TOTAL # OF SAMPLES
SAMPLING HAMMER TYPE: / DRIVING WT.	FIELD INSTRUMENTATION
	WEATHER: Cloudy / TEMP. 40° / PROJECT MANAGER JMG

ESP

Water 1.5'

DEPTH IN FEET	SAMPLES: TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED %: GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-6"					Black, Sandy Silt, Little Gravel	ML	15	20	55		0-6"		675
6-1'					6" Odor, sheen-like								
					Less black, not as bad as top						6-12"		37
					14" in odor + sheen						14-18"		19
1-3'					Well [illegible] Sand w/ gravel Brown, black + gray flecked	SM	20	65	15				
					more gravel + sand less fines								
					Refusal @ 2.5'								
					Sampled 2 more times in 2' radius + had refusal on all!								
					Maybe hitting large gravel, rock shelve or very tight clay!								
					Vertical Profile								

WasteTron, Inc.

BORING LOG

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PAGE OF

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RTb-STZ
DRILLING COMPANY	DRILLER K	DATE/TIME STARTED 3:35 PM	DATE/TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL # OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: TEMP.	PROJECT MANAGER

DEPTH IN FEET	SAMPLES: TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED % GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
					Log Sampler Water 2'								
0-1'	D/F		5"		Black, Silty Sand, Few Gravel	SM	10	60	30				16
1-2'	F/G		4"		Less Gravel		8						102
					Less Fines, Brown plastic speckled in color				15				22
					Refusal @ 1.5'								
					Took 1 more sample w/in 2' range (recovery low on these 2 samples 30-40%!)								
					TKPH								

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BORING LOG

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PAGE OF

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RT6-ST3
DRILLING COMPANY	DRILLER K	DATE/TIME STARTED 3:50P	DATE/TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL # OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: Cloudy TEMP. 40	PROJECT MANAGER JLC

DEPTH IN FEET	SAMPLES: TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED % GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
					ESP								
					Water 3.5'								
0	1' H/K		4"		Black, Silty Sand	SM	20	60	20				170
1-2'	1' L/K		4"		Same								83
2-3'	1' J/M		2"		Brown, Black, Gray speckled less fines				10-15				27
					Refusal @ 2'								
					Sampled 1x more - same refusal depth (less recovery also)								
					(TRPH)								

WasteTron, Inc.

BORING LOG

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PAGE OF

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. RT6-ST4
DRILLING COMPANY	DRILLER K	DATE/TIME STARTED 4:20 PM	DATE/TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL # OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: Cloudy TEMP. 40	PROJECT MANAGER JMG

Water 2'

DEPTH IN FEET	SAMPLES: TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED %: GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-1'	N/P/R		5"		Black, Silty Sand w/ Gravel	SM	20	60	20				453
1-2'	O/Q/S		1"		Black, Brown, Gray flecked less fines, less gravel		10	85	5				17
					Refusal @ 1'								
					Punched around appx 5' circle for deeper samples! NO DEEPER! 2 more samples taken								
					TRPH								

WasteTron, Inc.

BORING LOG

PAGE OF

PROJECT NAME AND LOCATION	PROJECT NUMBER
DRILLING COMPANY	DRILLER N
DRILLING EQUIPMENT AND METHOD	DATE/TIME STARTED 4:45 PM
SIZE AND TYPE OF BIT	DRILLING FLUID
SAMPLING HAMMER TYPE:	DRIVING WT.
BORING NO. B16 - NA	DATE/TIME COMPLETED
COMPLETION DEPTH	TOTAL # OF SAMPLES
FIELD INSTRUMENTATION	
WEATHER: Cloudy TEMP. 40	PROJECT MANAGER Riley

ESP

DEPTH IN FEET	SAMPLES TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED % GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
					1-2" organic cover on bank								
0-1'	T		6"		Black, Sandy Silt, Few	ML	10	30	60				127
					Gravel, Mucky-Sheeny looking								
1-2'	U		7"		Same								
					Less fines, less blackish								463
2-3'	V		0		Gravel		15	35	50				
					Refusal @ 2'								
					Vertical Profile								

WasteTron, Inc.

BORING LOG

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PAGE OF

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT6-NB
DRILLING COMPANY	DRILLER K	DATE/TIME STARTED 4:55P	DATE/TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL # OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: Windy TEMP. 40	PROJECT MANAGER RHB

DEPTH IN FEET	SAMPLES TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED % GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
					Appx 1" organic cover (rotting leaves)								
0-1'	W		10"		Black, organic silt, Wet		10	30	60		0-6"		164
1-2'	X		10"								6-12"		190
					moll sandy		10	40	50		1-2'		271
2-3'	Y		1"		Blackish Brown, Silty Sand, less gravel lg gravel		5	45	50				
					Refusal @ 2'								
					TRPH								

WasteTron, Inc.

BORING LOG

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PAGE OF

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT6-NC
DRILLING COMPANY	DRILLER	DATE/TIME STARTED 5:00 PM	DATE/TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL # OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: Cloudy TEMP. 40F	PROJECT MANAGER JHG

DEPTH IN FEET	SAMPLES: TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED % GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'	7		2.8'		Brown Silt 1"			20	80		0-6"		97
					Black, Silty Clay Green	Wet		30	70		6-12"		122
3-4'	AA		14"		Glossy odor						1-2'		140
					3' Changing to Brown						2-3'		173
					Brown, Sandy Clay, Damp-Wet			40	60		3-4'		62
					Terminated @ 4'								
					TRPH								

WasteTron, Inc.

BORING LOG

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PAGE OF

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT6-ND
DRILLING COMPANY	DRILLER	DATE/TIME STARTED 5:15PM	DATE/TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL # OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: Cloudy TEMP. 40	PROJECT MANAGER JMG

DEPTH IN FEET	SAMPLES: TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED % GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3' (B)			2.5'		Black, silt 2"			20	80		0-6"		74
					Black, silty clay organics			30	70		6-12"		83
											1-2'		117
3-4' (C)			12"		@ 2.9' Dk Brown, Sandy Clay organics			40	60		2-3'		228
											3-4'		16
													11
													13
					Terminated @ 4'								
					TPH								

WasteTron, Inc.

BORING LOG

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PAGE OF

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT6-SA
DRILLING COMPANY	DRILLER N	DATE/TIME STARTED 5:25P	DATE/TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL # OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: Cloudy TEMP. 40	PROJECT MANAGER JMG

Starting to get dark!

DEPTH IN FEET	SAMPLES TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED % GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'	DD		3'		Brown silt 1"			20	80		0-6"		199
					Black, Sandy Silty Clay			30	70		6-12"		212
					2' Sheen, odor						1-2'		386
					D4' Brown, less wet, more sandy			40	60		2-3'		21
					Terminated @ 3'								
					TRIH								

WasteTron, Inc.

BORING LOG

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PAGE OF

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT6-SB
DRILLING COMPANY	DRILLER K	DATE/TIME STARTED 5:35 PM	DATE/TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL # OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: Cloudy TEMP. 37F	PROJECT MANAGER LHG

DEPTH IN FEET	SAMPLES: TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED % GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'	EE		2.75'		Black, silt 1"			20	80		0-6"		171
					Black, Sandy silty Clay			30	70		6-12"		132
					Sheen, Odor						1-2'		250
					@ 2.5' Dk Brown, Damp-Wet						2-3'		51
					More stiff								
					Terminated @ 3'								
					TRPH								

WasteTron, Inc.

BORING LOG

1' 4'

PAGE OF

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. BT6-SC
DRILLING COMPANY	DRILLER N	DATE/TIME STARTED 5:50 PM	DATE/TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL # OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: Cloudy TEMP. 37	PROJECT MANAGER JMG

DEPTH IN FEET	SAMPLES TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED % GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'	FF		2.9'		Brown Sandy Silty Clay organics		5	30	65		0-6"		33
					1'						6-12"		114
3-6'	GG		3'								1-1.5'		24
					Dk Brown/Black						1.5-2'		125
					1.5 Black, Silty Clay, oily, odor Wet						2-3'		236
											3-4'		340
											4-4.5'		290
											4.5-5'		79
					4.5 changing to Dk Brown, less wet, no sheen						5-6'		86
					5' Brown								
					BOB @ 6'								
					TRPH								

WasteTron, Inc.

BORING LOG

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2'

PAGE OF

PROJECT NAME AND LOCATION		PROJECT NUMBER	BORING NO. B76-SD
DRILLING COMPANY	DRILLER K	DATE/TIME STARTED 6:10 PM	DATE/TIME COMPLETED
DRILLING EQUIPMENT AND METHOD		COMPLETION DEPTH	TOTAL # OF SAMPLES
SIZE AND TYPE OF BIT	DRILLING FLUID	FIELD INSTRUMENTATION	
SAMPLING HAMMER TYPE:	DRIVING WT.	WEATHER: Cloudy TEMP. 35F	PROJECT MANAGER JMG

Almost dark! Using Flashlights!

DEPTH IN FEET	SAMPLES: TYPE AND NUMBER	INTERVAL	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED %: GRAVEL	SAND	FINES	MOISTURE	CONSISTENCY	COLOR	FIELD READINGS
0-3'	HH				Brown, Silty, Clay, organics			40	60		0-6"		36
					1'						6-12"		44
					Dk Brown, musty organic odor		5	40	55		1-2'		97
3-6'	II				organics present, Damp						2-3'		123
											3-4'		11
											4-5'		9
											5-6'		3
					B.O.B @ 6'								
					TRPH								

Additional
Sampling and Analysis Report

Lower Mahoning River
(Pennsylvania)
Environmental Dredging Reconnaissance Study

Contract No. DACW59-98-D-0009

Prepared for:

Greenhorne & O'Mara, Inc.
Greenbelt, MD
And
Department of the Army
Pittsburgh District, Corps of Engineers
Pittsburgh, PA

June 2000

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1.0 Field Activities

WasteTron, Inc. and USACE-Pittsburgh personnel immobilized to New Castle, PA on May 17, 2000 to obtain additional sediment samples of the Mahoning River, PA portion. The focus of the additional sampling efforts were near Transect #4 (approximately River Mile 6.9) and Transect #2 (approximately River Mile 4.2). Samples were obtained from three locations near Transect #4 (two locations on the south/right side of the river and one location on the north/left side of the river) and from two locations near Transect #2 (one location on each side of the river). Samples were also collected at one location downstream of Transect #4, near Transect #3 (approximate River Mile 6.6). All sampling locations included a bank/river interface sampling point and a bank sampling point, with the exception of BT4, which included a bank/river interface sample only.

Resampling Locations ID	Location	Bank Locations	
		Distance Above Water	Distance From River
Transect 3 (SC1)(right bank/river interface)	~150' downstream of breached dam (near River Mile 6.6)	0	0
Transect 3 (SC2)(right bank)	~150' downstream of breached dam (near River Mile 6.6)	3.5'	3.4'
Transect 4 (SC1)(right bank/river Interface)	~200' upstream of breached dam (near River Mile 6.8)	0	0
Transect 4.5 (SC1)(right bank/river interface)	~500' upstream of breached dam (near River Mile 6.9)	0	0
Transect 4.5 (SC2)(right bank)	~500' upstream of breached dam (near River Mile 6.9)	6.85'	10.5'
Transect 4.5 (NC1)(left bank/river Interface)	~60' downstream of US Rt. 224 bridge (near River Mile 7)	0	0
Transect 4.5 (NC2)(left bank)	Under US Rt. 224 bridge (near River Mile 7)	3.4'	3.0'
Transect 2.5 (SC1)(right bank/river interface)	~400' upstream of Covert Rd. bridge (near River Mile 4.7)	0	0
Transect 2.5 (SC2)(right bank)	~400' upstream of Covert Rd. bridge (near River Mile 4.7)	2.0'	2.0'
Transect 2.5 (NC1)(left bank/river interface)	~250' upstream of Covert Rd. bridge (near River Mile 4.6)	0	0
Transect 2.5 (NC2)(left bank)	~250' upstream of Covert Rd. bridge (near River Mile 4.6)	1.3'	1.8'

Stainless steel pipe was utilized to collect samples of the sediment from the bank/river interface and in the bank areas. Sampling in these transects was advanced until refusal was obtained, with the exception of BT4.5-NC2, where the depth of silts exceeded the sampling gear depth. The samples were removed from the pipe and placed on aluminum foil for field classification. Field sampling logs and sampling location maps is included in Appendix C. After classification was complete, samples were composited by material type and depth. Samples were then placed into appropriate containers for laboratory analysis and then stored in coolers packed with ice.

2.0 Sediment Characterization

Sediments encountered that were the darkest, most oily smelling, and muckiest were generally sandy silts/silty sands and they were encountered in the bank/river interface area. There was a sheen noted on the water in

several locations were sampling was performed. There also were organics encountered in several of these sampling locations and they are noted on the boring logs in Appendix C.

3.0 Analytical Discussion

Compilations of all analytical data generated from this sampling event are included in Appendix A. Elutriate results indicate that the water quality will not be adversely impacted by removal activities of the sediments, if there are to be removed or disturbed. TCLP results indicate that the sediments are not hazardous waste but will need to be taken to a facility for proper disposal due to other constituents found in the material (i.e. PAHs, PCBs, and priority pollutant metals).

APPENDIX A ANALYTICAL DATA COMPILATIONS

BANK DATA: PRIORITY POLLUTANT METAL RESULTS (Results in mg/kg or ppm)
Lower Mahoning River (Pennsylvania) Environmental Dredging Study
May 17, 2000 Sampling Event

	SAMPLE DESCRIPTION		
PRIORITY POLLUTANT METALS	BT2.5-NC1-1-1.5'	BT4.5-SC1-0.5-5.5'	BT4.5-NC1-1-4.3'
MATRIX	SEDIMENT	SEDIMENT	SEDIMENT
LAB ID #	0005802-08A	0005774-01A	0005774-04A
Beryllium	2.55	3.00	2.85
Chromium	79.5	74.4	156
Copper	74.6	115	126
Lead	230	397	558
Nickel	53.0	71.4	85.3
Silver	<1.25	<1.25	1.33
Zinc	514	1810	2010
Antimony, Total	<0.500	<0.500	<0.050
Arsenic, Total	5.10	12.8	8.50
Cadmium, Total	0.545	3.88	2.06
Mercury, Total	0.65	1.29	0.63
Selenium, Total	<2.50	<2.50	<2.50
Thallium, Total	<1.00	<1.00	<1.00

< indicates non-detected at this laboratory reporting limit

PCBs	SAMPLE DESCRIPTION		
MATRIX	BT2.5-NC1-1-1.5' SEDIMENT	BT4.5-SC1-0.5-5.5' SEDIMENT	BT4.5-NC1-1-4.3' SEDIMENT
Lab ID #	**0005802-08A**	**0005774-01A**	**0005774-04A**
Aroclor 1016	<0.20	<0.30	0.73
Aroclor 1221	<0.20	<0.30	<0.29
Aroclor 1232	<0.20	<0.30	<0.29
Aroclor 1242	0.46	<0.30	<0.29
Aroclor 1248	<0.20	<0.30	<0.29
Aroclor 1254	0.79	<0.30	1.63
Aroclor 1260	<0.20	<0.30	<0.29

< indicates non-detected at this laboratory reporting limit

BANK DATA: SEMI-VOLATILE ORGANIC COMPOUNDS RESULTS (Results in mg/kg or ppm)
Lower Mahoning River (Pennsylvania) Environmental Dredging Study
May 17, 2000 Sampling Event

SEMI-VOLATILE ORGANIC COMPOUNDS	SAMPLE DESCRIPTION		
	BT2.5-NC1-1-1.5'	BT4.5-SC1-0.5-5.5'	BT4.5-NC1-1-4.3'
Matrix	SEDIMENT	SEDIMENT	SEDIMENT
LAB ID #	0005802-08A	0005774-01A	0005774-04A
Acenaphthene	<2.91	1.43	0.602
Acenaphthylene	<2.91	<0.566	<0.588
Anthracene	<2.91	2.49	0.909
Benzo(a)anthracene	4.05	2.82	1.98
Benzo(a)pyrene	3.58	2.22	1.44
Benzo(b)fluoranthene	3.66	2.71	1.77
Benzo(g,h,i)perylene	<2.91	1.24	<0.588
Benzo(k)fluoranthene	<2.91	0.813	0.668
Chrysene	3.44	2.72	1.86
Dibenzo(a,h)anthracene	<2.91	<0.566	<0.588
Flouranthene	8.95	8.46	5.19
Flourene	<2.91	3.66	0.943
Indeno(1,2,3-cd)pyrene	<2.91	1.42	0.787
Naphthalene	<2.91	7.52	<0.588
Phenanthrene	3.48	7.67	2.32
Pyrene	5.50	6.31	3.95

< indicates non-detected at this laboratory reporting limit

BANK SEDIMENT DATA:TRPH RESULTS (Results in mg/kg or ppm)
Lower Mahoning River (Pennsylvania) Environmental Dredging Study
May 17, 2000 Sampling Event

SAMPLING STATION		TRPH		SAMPLING STATION		TRPH
RESAMPLING BT2.5				**RESAMPLING BT4**		
BT2.5-SC1-0-0.5'		200		BT4-SC1-0-0.75'		724
BT2.5-SC1-0.5-1'		340		BT4-SC1-0.75-1.5'		2760
BT2.5-SC2-0-0.5'		286		BT4-SC1-1.5-2'		1790
BT2.5-SC2-0.5-1.5'		538		BT4-SC1-2-2.5'		2000
BT2.5-SC2-1.5-2'		412		**RESAMPLING BT4.5**		
BT2.5-NC1-0-0.5'		163		BT4.5-SC1-0-0.5'		946
BT2.5-NC1-0.5-1'		250		BT4.5-SC1-0.5-5.5'		1130
BT2.5-NC1-1-1.5'		197		BT4.5-SC1-5.5-8.2'		976
BT2.5-NC1-1.5-2.2'		69.8		BT4.5-SC2-0-5.5'		113
BT2.5-NC2-0-1'		111		BT4.5-SC2-5.5-7'		<20
BT2.5-NC2-1-3'		183		BT4.5-SC2-7-8'		69.4
BT2.5-NC2-3-3.5'		197		BT4.5-SC2-8-9.2'		<20
RESAMPLING BT3				BT4.5-NC1-0-0.5'		31.6
BT3-SC1-0-0.5'		125		BT4.5-NC1-0.5-1'		264
BT3-SC1-0.5-1'		74.8		BT4.5-NC1-1-4.3'		976
BT3-SC1-1-2'		282		BT4.5-NC1-4.3-4.5'		308
BT3-SC1-2-2.2'		138		BT4.5-NC2-0-2'		38.8
BT3-SC2-0-2'		67.6		BT4.5-NC2-2-3'		143
BT3-SC2-2-2.5'		165		BT4.5-NC2-3-6'		958
BT3-SC2-2.5-3.8'		143				
BT3-SC2-3.8-4'		185				

LANDFILL PROFILES
LOWER MAHONING RIVER (PENNSYLVANIA) ENVIRONMENTAL DREDGING STUDY
.May 2000

LANDFILL PROFILING PARAMETERS	REGULATORY LEVELS (ppm)	SAMPLE DESCRIPTION(MATRIX-SEDIMENT) BT2.5-NC1-1-1.5' (ppm)	BT4.5-SC1-0.5-5.5' (ppm)	BT4.5-NC1-1-4.3' (ppm)
LAB ID #		0005802-08A	0005774-01A	0005774-04A
TCLP METALS				
Arsenic	**5.0**	<0.100	<0.100	<0.100
Barium	**100.0**	<1.00	2.01	1.18
Cadmium	**1.0**	<0.050	<0.050	<0.050
Chromium	**5.0**	<0.500	<0.500	<0.500
Lead	**5.0**	<0.50	<0.50	<0.50
Silver	**5.0**	<0.100	<0.100	<0.100
Mercury	**0.2**	<0.002	<0.002	<0.002
Selenium	**1.0**	<0.100	<0.100	<0.100
TCLP PESTICIDES				
Chlordane	**0.03**	<0.002	<0.002	<0.002
Endrin	**0.02**	<0.020	<0.020	<0.020
gamma-BHC	**0.400**	<0.020	<0.020	<0.020
Heptachlor	**0.008**	<0.002	<0.002	<0.002
Heptachlor epoxide	**0.008**	<0.002	<0.002	<0.002
Methoxychlor	**10.0**	<0.020	<0.020	<0.020
Toxaphene	**0.5**	<0.002	<0.002	<0.002
TCLP HERBICIDES				
2,4,5-TP (Silvex)	**1.0**	<0.01	<0.01	<0.01
2,4-D	**10.0**	<0.05	<0.05	<0.05
TCLP VOLATILES				
Benzene	**0.5**	<0.050	<0.050	<0.050
Carbon tetrachloride	**0.5**	<0.050	<0.050	<0.050
Chlorobenzene	**100.0**	<0.050	<0.050	<0.050
Chloroform	**6.0**	<0.050	<0.050	<0.050
1,1-Dichloroethene	**0.7**	<0.050	<0.050	<0.050
1,2-Dichloroethane	**0.5**	<0.050	<0.050	<0.050
Methyl ethyl ketone	**200.0**	<1.00	<1.00	<1.00
Tetrachloroethene	**0.7**	<0.050	<0.050	<0.050
Trichloroethene	**0.5**	<0.050	<0.050	<0.050
Vinyl chloride	**0.2**	<0.050	<0.050	<0.050
TCLP SEMI-VOLATILES				
o-cresol	**200.0**	**<0.03**	<0.03	<0.04
m,p-cresol	**200.0**	**<0.07**	<0.06	<0.08
1,4-Dichlorobenzene	**7.5**	<0.02	<0.02	<0.02
2,4-Dinitrotoluene	**0.13**	<0.02	<0.02	<0.02
Hexachlorobenzene	**0.13**	<0.02	<0.02	<0.02
Hexachlorobutadiene	**0.5**	<0.02	<0.02	<0.02
Hexachloroethane	**3.0**	<0.02	<0.02	<0.02
Nitrobenzene	**2.0**	<0.02	<0.02	<0.02
Pentachlorophenol	**100.0**	<0.03	<0.03	<0.04
Pyridine	**5.0**	<0.02	<0.02	<0.02
2,4,5-Trichlorophenol	**400.0**	<0.03	<0.03	<0.04
2,4,6-Trichlorophenol	**2.0**	<0.03	<0.03	<0.04

< - Not detected at this reporting limit.

LOWER MAHONING RIVER (PENNSYLVANIA) ENVIRONMENTAL DREDGING STUDY, ELUTRIATE SUITE RESULTS

May 17, 2000 Sampling Event

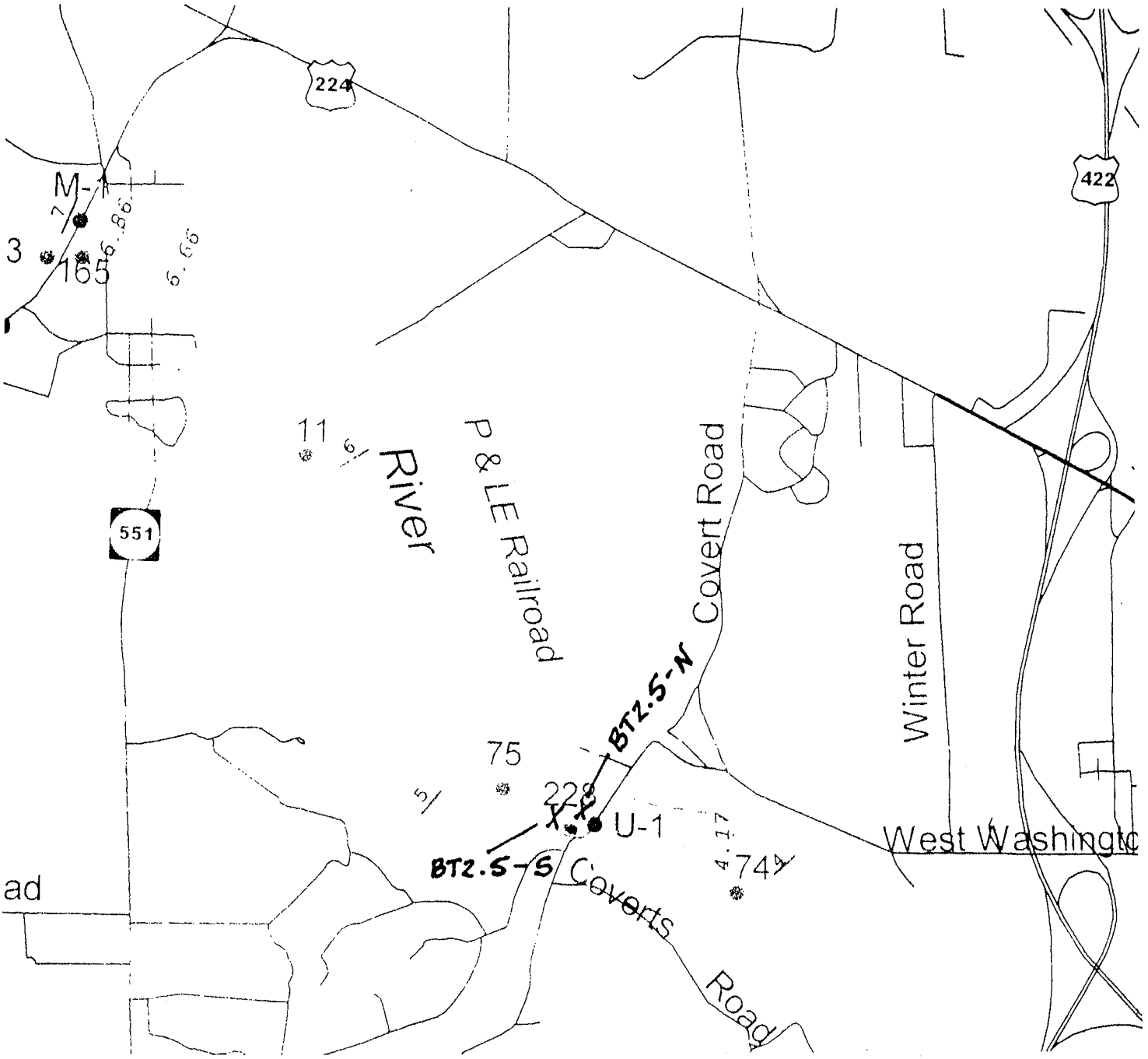
Elutriate Suite	Elutriate Water	Elutriate	Elutriate Water	Elutriate
Metals, Cyanide	(Pre-mix)	(Post-mix)	(Pre-mix)	(Post-mix)
	RT2.5	RT2.5-NC1	RT4.5	RT4.5-SC1
		1-1.5'		0.5-5.5'
LAB ID #	0005802-10A	0005802-09A	0005774-03A	0005774-02A
TOTAL METALS (mg/L)				
Antimony	<0.010	<0.010	<0.010	<0.010
Arsenic	0.0061 J	0.0114	0.0072 J	0.0137
Beryllium	<0.004	<0.004	<0.004	<0.004
Cadmium	<0.001	<0.001	<0.001	<0.001
Chromium	<0.010	<0.010	0.0028 J	<0.010
Copper	0.007 J	<0.100	0.006 J	<0.100
Lead	<0.010	0.0042 J	<0.010	<0.010
Nickel	<0.100	<0.100	<0.100	<0.100
Selenium	<0.010	<0.010	<0.010	0.0038 J
Silver	<0.050	<0.050	<0.050	<0.050
Thallium	<0.005	<0.005	<0.005	<0.005
Zinc	0.01 J	0.004 J	0.017 J	<0.050
Mercury, Total	<0.001	<0.001	<0.001	<0.001
SEMI-VOLATILES (mg/L)				
Acenaphthene	<0.011	<0.012	<0.010	<0.012
Acenaphthylene	<0.011	<0.012	<0.010	<0.012
Anthracene	<0.011	<0.012	<0.010	<0.012
Benzo(a)anthracene	<0.011	<0.012	<0.010	<0.012
Benzo(a)pyrene	<0.011	<0.012	<0.010	<0.012
Benzo(b)fluoranthene	<0.011	<0.012	<0.010	<0.012
Benzo(g,h,i)perylene	<0.011	<0.012	<0.010	<0.012
Benzo(k)fluoranthene	<0.011	<0.012	<0.010	<0.012
Chrysene	<0.011	<0.012	<0.010	<0.012
Dibenzo(a,h)anthracene	<0.011	<0.012	<0.010	<0.012
Flouranthene	<0.011	<0.012	<0.010	<0.012
Flourene	<0.011	<0.012	<0.010	<0.012
Indeno(1,2,3-cd)pyrene	<0.011	<0.012	<0.010	<0.012
Naphthalene	<0.011	<0.012	<0.010	<0.012
Phenanthrene	<0.011	<0.012	<0.010	<0.012
Pyrene	<0.011	<0.012	<0.010	<0.012
PCBs (ug/L)				
Aroclor 1016	<0.513	<0.926	<0.065	<0.913
Aroclor 1221	<0.513	<0.926	<0.065	<0.913
Aroclor 1232	<0.513	<0.926	<0.065	<0.913
Aroclor 1242	<0.513	<0.926	<0.065	<0.913
Aroclor 1248	<0.513	<0.926	<0.065	<0.913
Aroclor 1254	<0.513	<0.926	<0.065	<0.913
Aroclor 1260	<0.513	<0.926	<0.065	<0.193

J - Analyte detected below quantitation limits

< - Not detected at this reporting limit

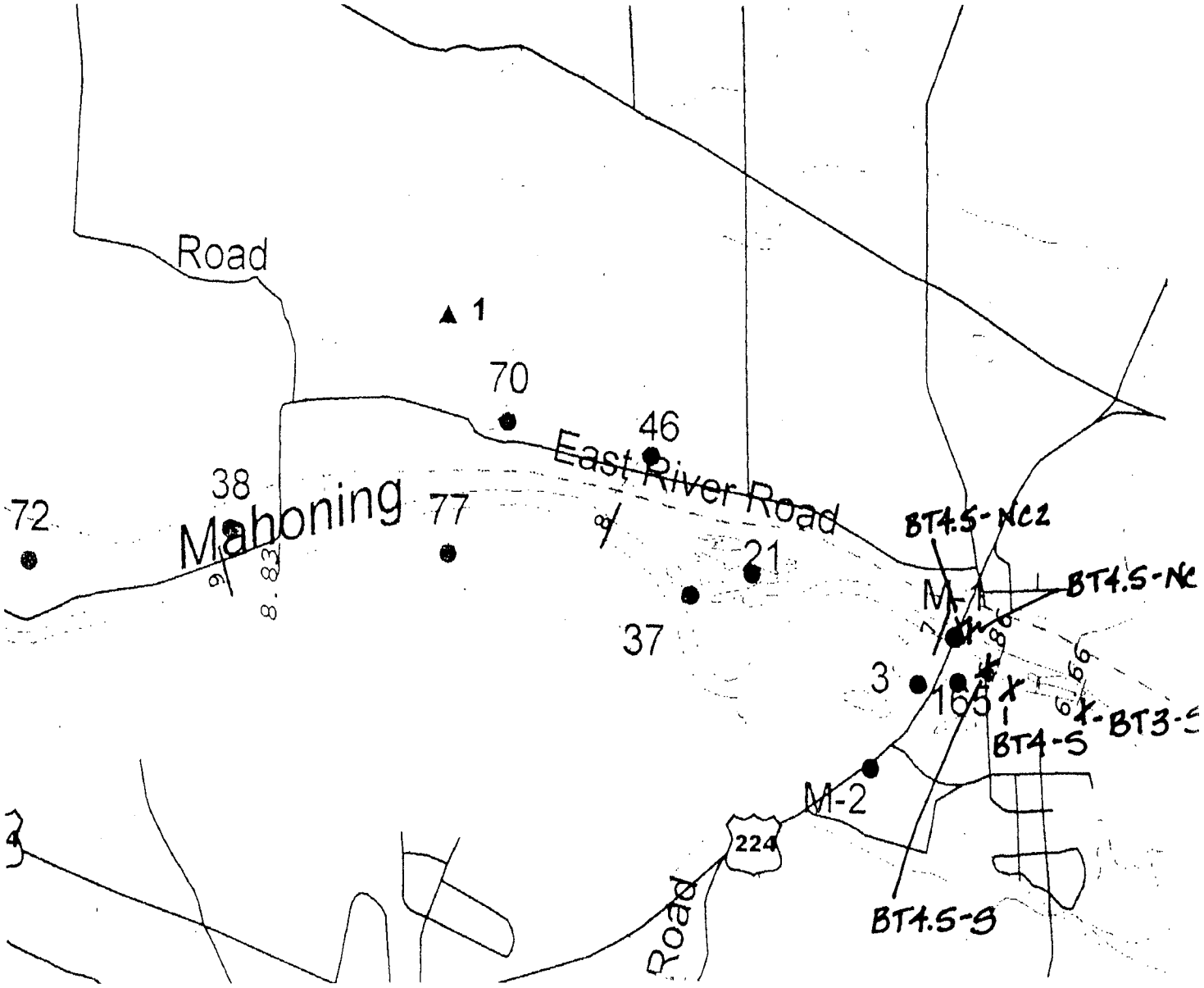
APPENDIX B CONTRACTOR LABORATORY DATA

APPENDIX C SAMPLING LOCATIONS MAPS AND BORING LOGS



SAMPLING LOCATIONS 5-17-00

BT2.2-S (Right Side)
BT2.5-N (Left Side)



SAMPLING LOCATIONS 5-17-00

BT3-S (Right Side)
BT4-S (Right Side)
BT4.5-S (Right Side)
BT4.5-NC1 (Left Side)
BT4.5-NC2 (Left Side)

Several cores taken @ this location:

WasteTron, Inc.
8520 Ohio River Road, Suite E
Wheelersburg, OH 45694
Phone: (740) 574-6144
Fax: (740) 547-4852

GEOLOGIC DRILLING LOG

PROJECT: Mahoning, PA JOB NO. 4568
CLIENT: OWNER:
DRILLER: DRILLING EQUIPMENT: SS pipe
GEOLOGIST: SAMPLING EQUIPMENT:
WEATHER: Sunny TEMPERATURE: 60 °F

DEPTH TO GROUNDWATER OBSERVATIONS
DEPTH UPON ENCOUNTER: FEET
DEPTH UPON COMPLETION: FEET
DEPTH UPON ENCOUNTER:
DEPTH UPON COMPLETION:
DEPTH UPON COMPLETION:

BORING NO. BT4.5-SC
~~SURFACE ELEVATION:~~
STATION LOCATION: 500' upstream of breeches dam
~~DRILLING DATE START:~~
~~DRILLING DATE END:~~
BORING LOG SHEET: 1 OF 1

12:30P 5-17-00

DEPTH	SAMPLE NUMBER	% SAMPLE RECOVERY	SOIL DESCRIPTION	USCS SYMBOL	CLASSIFICATION	GRADATION ESTIMATION % GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY (<2μ)	DRY UNIT WEIGHT (pcf) ESTIMATE	WATER CONTENT	~~PID READINGS~~ TRPH RESULTS
			BANK/RIVER INTERFACE										
0.5'			Dk grayish-brown Silty Sand				80		20			Wet	946
5.5'			Dk gray to black Clayey silt w/ thin sand lenses (muck)				10-20		80			Wet	1130
8.2'			Mottled Dk grayish brown/black Sandy silt w/ organics (muck)				40		60			Wet	976
			BOB @ 8.2'										

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Fax: (740) 547-4852

GEOLOGIC DRILLING LOG

PROJECT: Mahoning, PA JOB NO. 4568
CLIENT: OWNER:
DRILLER: DRILLING EQUIPMENT: SS pipe
GEOLOGIST: SAMPLING EQUIPMENT:
WEATHER: Sunny TEMPERATURE: 60 °F

DEPTH TO GROUNDWATER OBSERVATIONS
DEPTH UPON ENCOUNTER: FEET
DEPTH UPON COMPLETION: FEET
DEPTH UPON ENCOUNTER:
DEPTH UPON COMPLETION:
DEPTH UPON COMPLETION:

BORING NO. B14.5-S
~~SURFACE ELEVATION:~~
STATION LOCATION: 500' upst of trench du
~~DRILLING DATE START:~~
~~DRILLING DATE END:~~
BORING LOG SHEET: 1 OF 1

12:00P 5.17.00

DEPTH	SAMPLE NUMBER	% SAMPLE RECOVERY	SOIL DESCRIPTION	USCS SYMBOL	CLASSIFICATION	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY (<2μ)	DRY UNIT WEIGHT (pcf) ESTIMATE	WATER CONTENT	~~PID READINGS~~ TRPH RESULTS
			6.85' Above Water 10.5' from River										
			Grayish brown										
5.5'			Sandy silt w/ organics (roots)									Moist	113
7'			Mottled grayish brown/brown Sandy silt w/ wood fragments					35	65			Moist	<20
8'			Mottled grayish brown/black Silty sand w/ clay 70% sand					70	30			Wet	69.4
9.2'			Mottled brown/grayish brown Silty sand w/ wood fragments 80% sand					80	20			Wet	<20
			Tan, very fine sand + Lg gravel/rock in bottom of sample (Bottom 1.5" of sample) B.O.B @ 9.2'										

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GEOLOGIC DRILLING LOG

PROJECT: Mahoning, PA JOB NO. 4568
CLIENT: OWNER:
DRILLER: DRILLING EQUIPMENT: SS pipe
GEOLOGIST: SAMPLING EQUIPMENT:
WEATHER: Sunny TEMPERATURE: 60 °F

DEPTH TO GROUNDWATER OBSERVATIONS
DEPTH UPON ENCOUNTER: FEET
DEPTH UPON COMPLETION: FEET
DEPTH UPON ENCOUNTER:
DEPTH UPON COMPLETION:
DEPTH UPON COMPLETION:

BORING NO. BT4.5-M
~~SURFACE ELEVATION:~~
STATION LOCATION: 50-70' downstream of b
~~DRILLING DATE START:~~
~~DRILLING DATE END:~~
BORING LOG SHEET: 1 OF 1

2:00P 5-17-00

DEPTH	SAMPLE NUMBER	% SAMPLE RECOVERY	SOIL DESCRIPTION	USCS SYMBOL	CLASSIFICATION	GRADATION ESTIMATION % GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY (<2μ)	DRY UNIT WEIGHT (pcf) ESTIMATE	WATER CONTENT	~~PID READINGS~~ TRPH RESULTS
			BANK/RIVER INTERFACE										
0.5'			Dk Brownish gray to black Silty sand				70		30			Wet	31.6
1'			Black Sandy silt (muck) <20% sand				20		80			Wet	264
4.3			Black Sandy silt (muck) <10% sand				10		90			Wet	976
4.5'			Black Sandy silt w/ gravel			25	30		45			Wet	308
			Several cores taken to collect samples for analytical										

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GEOLOGIC DRILLING LOG

PROJECT: Mahoning, PA JOB NO. 4568
CLIENT: OWNER:
DRILLER: DRILLING EQUIPMENT: SS pipe
GEOLOGIST: SAMPLING EQUIPMENT:
WEATHER: Sunny TEMPERATURE: 60 °F

DEPTH TO GROUNDWATER OBSERVATIONS
DEPTH UPON ENCOUNTER: FEET
DEPTH UPON COMPLETION: FEET
DEPTH UPON ENCOUNTER:
DEPTH UPON COMPLETION:
DEPTH UPON COMPLETION:

BORING NO. B-4.5-N
~~SURFACE ELEVATION:~~
STATION LOCATION: Under bridge
~~DRILLING DATE START:~~
~~DRILLING DATE END:~~
BORING LOG SHEET: 1 OF 1

2:30 P 5-17-00

DEPTH	SAMPLE NUMBER	% SAMPLE RECOVERY	SOIL DESCRIPTION 3.4' Above Water 3.0' From River	USCS SYMBOL	CLASSIFICATION	GRADATION ESTIMATION % GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY (<2μ)	DRY UNIT WEIGHT (pcf) ESTIMATE	WATER CONTENT	~~PID READINGS~~ TRPH RESULTS
2'			Brown Sandy silt				30		70			Moist	38.8
3'			Dk Brown Sandy silt w/ thin black lenses				30		70				143
6'			Black Silt (muck)				40		60			Wet	958
			BOB @ 6' Ran out of sampler - depth of deposits unknown										

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GEOLOGIC DRILLING LOG

PROJECT: Mahoning, PA JOB NO. 4568
CLIENT: OWNER:
DRILLER: DRILLING EQUIPMENT: SS pipe
GEOLOGIST: SAMPLING EQUIPMENT:
WEATHER: Sunny TEMPERATURE: 60 °F

DEPTH TO GROUNDWATER OBSERVATIONS
DEPTH UPON ENCOUNTER: FEET
DEPTH UPON COMPLETION: FEET
DEPTH UPON ENCOUNTER:
DEPTH UPON COMPLETION:
DEPTH UPON COMPLETION:

BORING NO. BTZ-5-S
SURFACE ELEVATION:
STATION LOCATION: 400' upstre of bridge
~~DRILLING DATE START~~:
DRILLING DATE END:
BORING LOG SHEET: 1 OF 1

4:15P 5-17-00

DEPTH	SAMPLE NUMBER	% SAMPLE RECOVERY	SOIL DESCRIPTION BANK/RIVER INTERFACE	USCS SYMBOL	CLASSIFICATION	GRADATION ESTIMATION % GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY (<#)	DRY UNIT WEIGHT (pcf) ESTIMATE	WATER CONTENT	~~PID~~ ~~READINGS~~ TRPH RESULTS
0.5'			Brownish gray Silty Sand w/ minor organics				15		25			Wet	200
1'			Dk Brownish gray Silty Sand				70		30			Wet	340
			BOB @ 1'										

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GEOLOGIC DRILLING LOG

PROJECT: Mahoning, PA JOB NO. 4568
CLIENT: OWNER:
DRILLER: DRILLING EQUIPMENT:
GEOLOGIST: SAMPLING EQUIPMENT:
WEATHER: Sunny TEMPERATURE: 60 °F

DEPTH TO GROUNDWATER OBSERVATIONS
DEPTH UPON ENCOUNTER: FEET
DEPTH UPON COMPLETION: FEET
DEPTH UPON ENCOUNTER:
DEPTH UPON COMPLETION:
DEPTH UPON COMPLETION:

BORING NO. [illegible]
~~SURFACE ELEVATION:~~
STATION LOCATION: 400' upstr of bridge
~~DRILLING DATE START:~~
~~DRILLING DATE END:~~
BORING LOG SHEET: OF

4:20P 5.17.00

DEPTH	SAMPLE NUMBER	% SAMPLE RECOVERY	SOIL DESCRIPTION	USCS SYMBOL	CLASSIFICATION	GRADATION ESTIMATION % GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY (<#)	DRY UNIT WEIGHT (pcf) ESTIMATE	WATER CONTENT	~~PID READINGS~~ TRPH RESULTS
			2.0' Above Water 2.0' From River										
0.5'			Mottled Dk Brownish gray/grayish brown organics present Silty sand 50% sand				50		50			Moist	286
1.5'			Mottled Brown/Dk brownish gray/black Silty sand				70		30				538
2'			Dk gray to black Silty sand w/ organics	very fine sand 50% sand			50		50			Wet	412
			BOB @ 2'										

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GEOLOGIC DRILLING LOG

PROJECT: Mahoning, PA JOB NO. 4568
CLIENT: OWNER:
DRILLER: DRILLING EQUIPMENT: SS pipe
GEOLOGIST: SAMPLING EQUIPMENT:
WEATHER: Sunny TEMPERATURE: 60 °F

DEPTH TO GROUNDWATER OBSERVATIONS	
DEPTH UPON ENCOUNTER:	FEET
DEPTH UPON COMPLETION:	FEET
DEPTH UPON ENCOUNTER:	
DEPTH UPON COMPLETION:	
DEPTH UPON COMPLETION:	

BORING NO. BT2.5-NC
~~SURFACE ELEVATION:~~
STATION LOCATION: 250' upstr of bridge
~~DRILLING DATE START:~~
~~DRILLING DATE END:~~
BORING LOG SHEET: 1 OF 1

5:00 P 5-17-00

DEPTH	SAMPLE NUMBER	% SAMPLE RECOVERY	SOIL DESCRIPTION BANK/RIVER INTERFACE	USCS SYMBOL	CLASSIFICATION	GRADATION ESTIMATION % GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY (<2μ)	DRY UNIT WEIGHT (pcf) ESTIMATE	WATER CONTENT	~~PID READINGS~~ TRPH RESULTS
0.5'			Brownish gray Silty sand w/ organics				90		10			Wet	163
1'			Brownish gray Clayey sand (slight odor)				80		20			Wet	250
1.5'			Dk brownish gray - sample becoming darker w/ depth Silty sand w/ organics (much)				90		10			Wet	197
2.2'			Mottled brown/orange Sand + gravel 40% sand			50	40		10			Wet	69.8
			B.O.B @ 2.2'										

WasteTron, Inc.
8520 Ohio River Road, Suite E
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Phone: (740) 574-6144
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GEOLOGIC DRILLING LOG

PROJECT: Mahoning, PA JOB NO. 4568
CLIENT: OWNER:
DRILLER: DRILLING EQUIPMENT: SS pipe
GEOLOGIST: SAMPLING EQUIPMENT:
WEATHER: Sunny TEMPERATURE: 60 °F

DEPTH TO GROUNDWATER OBSERVATIONS
DEPTH UPON ENCOUNTER: FEET
DEPTH UPON COMPLETION: FEET
DEPTH UPON ENCOUNTER:
DEPTH UPON COMPLETION:
DEPTH UPON COMPLETION:

BORING NO. [illegible]
~~SURFACE ELEVATION:~~
STATION LOCATION: 250' upst of bridg
~~DRILLING DATE START:~~
~~DRILLING DATE END:~~
BORING LOG SHEET: 1 OF 1

5:15 P 5·17·00

DEPTH	SAMPLE NUMBER	% SAMPLE RECOVERY	SOIL DESCRIPTION 1.3' Above Water 1.8' From River	USCS SYMBOL	CLASSIFICATION	GRADATION ESTIMATION % GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY (<2μ)	DRY UNIT WEIGHT (pcf) ESTIMATE	WATER CONTENT	~~PID READINGS~~ TRPH RESULTS
1'			Grayish brown Silty sand				60		40			Moist	111
3'			Dk grayish brown Silty sand				70		30			Wet	183
3.5'			Dk brownish gray Silty sand w/ organics	Very fine sand			70		20-30				197
			BOB @ 3.5'										

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GEOLOGIC DRILLING LOG

PROJECT: Mahoning, PA JOB NO. 4568
CLIENT: OWNER:
DRILLER: DRILLING EQUIPMENT: SS pipe
GEOLOGIST: SAMPLING EQUIPMENT:
WEATHER: Sunny TEMPERATURE: 60 °F

DEPTH TO GROUNDWATER OBSERVATIONS
DEPTH UPON ENCOUNTER: FEET
DEPTH UPON COMPLETION: FEET
DEPTH UPON ENCOUNTER:
DEPTH UPON COMPLETION:
DEPTH UPON COMPLETION:

BORING NO. B13-SC1
~~SURFACE ELEVATION:~~
STATION LOCATION: 150' down stream of breached dam
~~DRILLING DATE START:~~
~~DRILLING DATE END:~~
BORING LOG SHEET: 1 OF 1

10:00 A 5.17.00

DEPTH	SAMPLE NUMBER	% SAMPLE RECOVERY	SOIL DESCRIPTION BANK/RIVER INTERFACE	USCS SYMBOL	CLASSIFICATION	GRADATION ESTIMATION % GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY (<0.#)	DRY UNIT WEIGHT (pcf) ESTIMATE	WATER CONTENT	~~PID READINGS~~ TRPH RESULTS
0.5'			Dk grayish/black Sandy Silt w/ organics <20% v.f. sand				20		80			Wet	125
1'			Dk grayish black Silty Sand				50		50			Wet	74.8
2'			organics increasing w/ depth Dk grayish brown Sandy silt w/ organics 20% sand				20		80			Wet	282
2.2'			Brown Silty Sand 70% sand				70		30			Wet	138
			BOB @ 2.2'										

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GEOLOGIC DRILLING LOG

PROJECT: Mahoning, PA JOB NO. 4568
CLIENT: OWNER:
DRILLER: DRILLING EQUIPMENT: SS pipe
GEOLOGIST: SAMPLING EQUIPMENT:
WEATHER: Sunny TEMPERATURE: 60 °F

DEPTH TO GROUNDWATER OBSERVATIONS
DEPTH UPON ENCOUNTER: FEET
DEPTH UPON COMPLETION: FEET
DEPTH UPON ENCOUNTER:
DEPTH UPON COMPLETION:
DEPTH UPON COMPLETION:

BORING NO. B-3
~~SURFACE ELEVATION:~~
STATION LOCATION: 150' downstream of bleachery
~~DRILLING DATE START:~~
~~DRILLING DATE END:~~
BORING LOG SHEET: 1 OF 1

10:30A 5-17-00

DEPTH	SAMPLE NUMBER	% SAMPLE RECOVERY	SOIL DESCRIPTION 3.5' Above Water 3.4' from River	USCS SYMBOL	CLASSIFICATION	GRADATION ESTIMATION % GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY (<2μ)	DRY UNIT WEIGHT (pcf) ESTIMATE	WATER CONTENT	~~PID READINGS~~ TRPH RESULTS
2'			Grayish Brown Roots found in sample Clayey Sand 50% sand				50		50			Moist	67.6
2.5'			Dk grayish brown to black Sandy silt <20% sand	sand content decreasing w/ depth			20		80			Moist	165
3.8'			Black (muck) odor noted / sheen noted Clayey-silt <5% sand				5		95			Wet	143
4'			Mottled grayish brown/brown slight odor Sandy clay				20		80			Moist	185
			BOB @ 4'										

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GEOLOGIC DRILLING LOG

PROJECT: Mahoning, PA JOB NO. 4568
CLIENT: OWNER:
DRILLER: DRILLING EQUIPMENT: SS Pipe
GEOLOGIST: SAMPLING EQUIPMENT:
WEATHER: Sunny, 60°F TEMPERATURE: °F

DEPTH TO GROUNDWATER OBSERVATIONS
DEPTH UPON ENCOUNTER: FEET
DEPTH UPON COMPLETION: FEET
DEPTH UPON ENCOUNTER:
DEPTH UPON COMPLETION:
DEPTH UPON COMPLETION:

BORING NO. BT4-SC1
~~SURFACE ELEVATION:~~
STATION LOCATION: 200' upstream of bleached clay
~~DRILLING DATE START:~~
~~DRILLING DATE END:~~
BORING LOG SHEET: 1 OF 1

9:30 A 5.17.00

DEPTH	SAMPLE NUMBER	% SAMPLE RECOVERY	SOIL DESCRIPTION BANK/RIVER INTERFACE	USCS SYMBOL	CLASSIFICATION	GRADATION ESTIMATION % GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY (<2μ)	DRY UNIT WEIGHT (pcf) ESTIMATE	WATER CONTENT	~~PID READINGS~~ TRPH RESULTS
0.75'			D. Gray to Black Organic silt (muck) w/ sand				15		85			moist	724
1.5'			Dk. Gray to Black Organic silt/clay (muck)				10		90			Wet	2760
2.0'			Dk Gray to Black (muck) very fine silty sand (organics)				50		50			Wet	1790
2.5'			Dk Grayish Brown Very fine sandy silt w/ organics				35		65			Wet	2000
			BOB @ 2.5'										