SWMU ASSESSMENT REPORT
ZONE 2 SWMUs
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20 and S-27)

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1.0 INTRODUCTION

This report documents the results of an environmental assessment of SWMU Group SFA-1, the Zone 2 SWMUs, at Bethlehem Steel Corporation's (BSC's) Lackawanna, New York facility. Zone 2 primarily consists of Solid Waste Management Units (SWMUs) S-1, S-2, S-4, S-5, S-6, S-7/S-20, and S-27, as designated by the United States Environmental Protection Agency (USEPA). These SWMUs were identified in the Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) (USEPA 1988) because of the nature of the material stored in the units. The USEPA has required that a RCRA Facility Investigation (RFI) of these and other SWMUs at the BSC facility be completed in accordance with the Administrative Order on Consent (AOC) signed by BSC and USEPA in 1990 (USEPA 1990b). The RFI has been conducted in phases, and included field work consisting of the collection and analysis of environmental samples from SWMUs and other areas throughout the property.

Preliminary SWMU assessments were completed on SWMUs S-2 (BSC 1992a), S-4 (BSC 1992b), S-6 (BSC 1992c), and S-7/S-20 (BSC 1992d, BSC 1992e), which were submitted to the USEPA between August 15, 1992 and October 29, 1992. Attachment A provides USEPA New York Department of Environmental Conservation (NYSDEC) comments regarding the Preliminary SWMU Assessments. This assessment report provides additional information to adequately address the USEPA's comments on these SWMUs. This report evaluates SWMU data available to BSC as of March 2002.

1.1 Description

SWMU Group SFA-1 is located in the western end of Zone 2 within the Slag Fill Area (SFA) at BSC's Lackawanna plant in an area known as "the impoundments" (Figure 1). The impoundments are comprised of ten SWMUs: S-1, S-2, S-3, S-4, S-5, S-6, S-7/S-20, S-8, and S-27. Two of the SWMUs, S-3 and S-8 are not assessed in this report. SWMU S-3 is a delisted Hazardous Waste Management Unit and S-8 is an empty impoundment, which was never put into service. Both SWMUs are assessed in separate reports. The remaining eight impoundment SWMUs (S-1, S-2, S-4, S-5, S-6, S-7/S-20 and S-27) are grouped together as SWMU Group SFA-1 and are assessed in this report.

SWMU Group SFA-1 is approximately 300 feet south of Smokes Creek and 300 feet east of Lake Erie. Lake Erie's elevation during April 2000 was 570.5 feet above mean sea level (msl). Groundwater beneath SMWU Group SFA-1 is approximately 573-575 feet above msl and is anticipated to flow east to west toward Lake Erie.

Dames & Moore conducted site inspections of SWMU Group SFA-1 in February 1995 and August 1995. The August 1995 inspection included representatives of USEPA Region II. Additional inspections were completed in September 1996 by Dames & Moore and in August 2000 and April 2001 by URS Corporation (URS). Documentation of the 1996, 2000 and 2001 site visits are provided in Appendix A. The following is a description of the SWMUs based on site observations and information obtained from both RFI and non-RFI subsurface investigations. These investigations are discussed in more detail in Section 2.0.

SWMU S-1 is a bermed surface impoundment approximately 2 acre in area. The unit is approximately 365 feet long by 250 feet wide with an average distance of 7 feet from top of berm to the surface of the unit. The maximum depth of the unit is approximately 24 feet from surface to base. Beneath the base of the unit is slag, with groundwater located approximately 26 feet beneath the base of the SWMU. The SWMU material is mainly black oil sludge. Ponded water has been observed along the north end of the impoundment and has had a surface sheen. During the May 2001 site visit, water covered 40 to 50% of the SWMU material. There was a petroleum odor, with scattered debris on the surface of the SWMU material. No vegetation was observed on the SWMU surface. The berms surrounding the SWMU are composed mainly of coarse slag with a sparse vegetative cover.

SWMU S-2 is a bermed impoundment approximately 2 acre in area. The unit is approximately 370 feet long by 260 feet wide with an average distance of 4 feet from top of berm to the surface of the unit. The maximum depth of the unit is approximately 27 feet from surface to base. Beneath the base of the unit is slag, with groundwater located approximately 20 feet beneath the base of the SWMU. The central area has no vegetation and the SWMU material is reddish-brown in color. Approximately 70% of the surface is covered in grass, shrubs, and several trees intermixed with debris. No standing water was observed. Based upon the slope of the SWMU, all surface water would drain toward the center of the SWMU. The berms are composed of slag and construction debris.

SWMU S-4 is a bermed impoundment approximately 2.5 acre in area. The unit is approximately 365 feet long by 290 feet wide with an average distance of 23 feet from top of berm to the surface of the unit. The maximum depth of the unit is approximately 38 feet from surface to base. Beneath the base of the unit is slag with groundwater located approximately 15 feet beneath the base of the SWMU. The SWMU material is covered with vegetation, mostly tall trees and is bounded by gravel access roads. The berms are composed of slag and construction debris.

SWMU S-5 is a bermed impoundment approximately 1.5 acre in area. The unit is approximately 350 feet long by 195 feet wide with an average distance of 10 feet from top of berm to the surface of the unit. The maximum depth of the unit is approximately 21 feet from surface to base. Beneath the base of the unit is slag with groundwater located approximately 24 feet beneath the base of the SWMU. The south half of the SWMU contains oily, brown to black iron rich, sludge piles. The north end contains ponded water, reeds and phragmites (common reeds). The berms are composed mainly of slag.

SWMU S-6 is a bermed impoundment approximately 1.5 acre in area. The unit is approximately 250 feet long by 210 feet wide with an average distance of 7 feet from top of berm to the surface of the unit. The maximum depth of the unit is approximately 34 feet from surface to base. Beneath the base of the unit is slag with groundwater located approximately 25 feet beneath the base of the SWMU. The pit is surrounded by debris piles in a berm-like configuration. These berm-like piles consist of soil, slag gravel, and bricks ranging 2-5 feet above grade. The floor of the unit is flat, composed of iron-rich material with cohesive silty appearance.

S-7/S-20 is a bermed impoundment approximately 4 acre in area. The unit is approximately 471 feet long by 395 feet wide with an average distance of 14 feet from top of berm to the surface of the unit. The maximum depth of the unit is approximately 41 feet from surface to base. Beneath the base of the unit is slag with groundwater located approximately 27 feet beneath the base of the SWMU. The surface of the impoundment is covered with a cap of portland cement and slag and slopes approximately 8 feet from the southwest to the northeast and is non-vegetated and covered in red, granular material. Concrete-like pads from former stabilization pilot tests are present on the south end of the unit. The unit is bounded on the west and south sides by gravel access roads with one access road located on the east side that provides access and surface water drainage for the SWMU. The eastern side of the unit's berm slopes steeply to S-21 and the acid tar pit area.

SWMU S-27 is approximately a 1-acre. The SWMU is about 380 feet long by 115 feet wide, irregularly shaped with an average distance of 7 feet from top of berm to the surface of the unit and slopes approximately 30 feet from the north to the south. The maximum depth of the unit is not known due to the lack of boring and well construction logs for the SWMU. The slope is uniform to undulating and mostly covered by trees, shrubs, grasses, and moss. The SWMU material is medium to dark brown where exposed with scattered debris (e.g., tires, metal). Incised drainage was not noted, nor was any containment observed to the south end. Piles of concrete were noted at the base of the slope.

1.2 History

Zone 2 SWMUs were built in the early 1970's as a means of managing materials produced by BSC's water quality control stations (WQCSs), namely; solids that settled out of treated waters. The WQCSs were built around 1970, in response to the Clean Water Act, to treat process waters produced by plant operations.

1.2.1 Water Quality Control Stations Histories

WQCS Nos. 1, 2, and 4 treated process waters from the Slabbing Mill, Bar Mills, and South Mills Complex, respectively. The process waters came from scale settling pits and similar facilities following the removal of iron oxide scale from steel rolling and shaping operations. The settled scale was recovered and recycled. The water was then pumped to the WQCS for further settling and sand filtration before being discharged either directly or indirectly to Smokes Creek. The sand filter backwash sludges were deposited in SWMU S-1 and S-5. WQCS No.2 was also used to treat wastewaters from SWMU P-33 (10-inch mill and 12-inch mill scale pit), SWMU P-34 (13-inch mill scale pit), SWMU P-35 (pouring reel process water pit), SWMU P-36 (sand filter), and SWMU P-37 (treated water storage tank).

WQCS No. 3 produced BOF (basic oxygen furnace) final thickener sludge, consisting principally of iron oxides and lime, by gravimetric separation of wastewaters from the BOF Gas Scrubber System and the Sinter Plant Dedusting System. EP Toxicity testing of the final thickener sludge for metals indicated that it did not exhibit hazardous characteristics (USEPA NEIC 1988).

WQCS No. 5, the North Mills process water complex, received water from scale (i.e., settling) pits and similar facilities, following removal of iron oxide scale from steel during rolling and shaping operations. The settled scale was recovered and recycled and the water pumped to WQCS No. 5 for further settling and sand filtration before being discharged to the North Return Water Trench. The filter backwash sludges from the WQCSs were deposited in SWMUs S-1 and S-5. Testing of materials in SWMUs associated with WQCS No. 5, prior to its demolition, demonstrated that they did not exhibit hazardous characteristics (USEPA NEIC 1988).

WQCS No. 6 was used to treat hot strip mill process waters, which contained iron oxide sludge, scale and oil. The scale and sludge were determined to be non-hazardous; however, the oil may have contained cyanide and other hazardous constituents (USEPA NEIC 1988).

WQCS No. 7 primarily produced iron hydroxide sludge from alkaline neutralization and air sparging of acid rinse waters from the Cold Strip Mill pickling operation. Alkaline neutralization entails neutralizing acidic process waters with lime. This process, along with air sparging, causes the precipitation of metals that are soluble in an acidic environment, but which form relatively insoluble metal hydroxides in an alkaline environment. The sludge from WQCS No. 7 may also have contained iron oxides and oil and grease. Indications are that, for a time, WQCS No. 7 also received waste oil from the 54-inch and 75-inch tandem mills. EP Toxicity testing of sludge samples from WQCS No. 7 revealed that the sludge did not exhibit hazardous waste characteristics (USEPA 1988).

WQCS No. 9 produced blast furnace final thickener sludge by gravimetric separation of blast furnace slurry. EP Toxicity testing in 1990 and additional testing in 1992 of WQCS No. 9 sludges for metals revealed that the sludge did not exhibit hazardous characteristics (BSC 1991, 1992f, 1992g, USEPA 1990).

The following table summaries the WQCS waste disposal areas in the SWMU Group SFA-1:

Water Quality Control Station Waste								
SWMU	WQCS #1	WQCS #2	WQCS #3	WQCS #4	WQCS #5	WQCS #6	WQCS #7	WQCS #9
S-1	X	X	X	X	X	X	X	
S-2			X				X	X
S-4		X	X			X	X	X
S-5	X	X	X	X	X		X	
S-6			X				X	
S-7/20			X				X	
S-27	X	X	X	X	X	X	X	

"X"- Denotes waste from WQCS may have been placed in the SWMU.

1.2.2 Solid Waste Management Units Histories

SWMU S-1

Based on early operations records and sampling and analysis, it was determined that SWMU S-1 received mainly sand filter backwash sludges from WQCS Nos. 1, 2, 4, 5, and primarily No. 6, plus waste oil from other plant operations. These sludges were black in color and contained iron oxides, rolling oils, lubricants, and water. Additional samples collected in the late 1980s and early 1990s also revealed some red sludges in S-1 that were believed to be from WQCS No. 3 (BOF sludge) and WQCS No. 7 (lime neutralized pickling and galvanizing lime waste waters). Two adjacent SWMUs, S-5 and S-27, are also used to store similar wastes from these WQCSs.

S-1 operated until about 1983, when the Lackawanna plant ceased its primary operations. In October 1985, Ecology and Environment, Inc., an engineering consultant, submitted a closure plan for S-1, in accordance with the New York State regulations 6 NYCRR Part 360.8, and NYSDEC guidelines (Ecology and Environment, 1985). At the time of the closure plan, oil within the impoundment was being removed and sent to a refiner, Diamond Energy Corp., located in Mt. Vernon, Ohio. The closure plan proposed the stabilization of the sludge with lime. Sludge sampling and analysis was recommended to fully characterize the sludge materials in the impoundments as hazardous or non-hazardous wastes.

Since 1988, BSC has conducted a series of studies toward identifying a cost effective means of recovering, for beneficial reuse, the materials managed in S-1, S-5 and S-27. Earlier studies focused on biological, incineration and extraction technologies to reduce the oil content in the materials. In 1992, as a result of one of these studies, BSC sponsored several pilot scale tests of a proprietary extraction process, which had the promise of cost effectively removing the oil and waste from the materials to facilitate recycling the solids in sintering and to be reused as fuel. In addition, a further objective of the test was to determine if the solids could be recycled for use in the sintering process. The pilot scale tests demonstrated the viability of the process and as a result, in 1995, BSC commissioned the design and economic analysis of a full-scale system.

In 1997, field tests were conducted to evaluate options for removing ponded water from the SWMUs, and for extraction and sizing the sludge for subsequent de-oiling. Because of the favorable results of all of the tests, BSC planned to construct and operate a pilot plant in 1998 for the de-oiling of the iron-rich waste stored in SWMUs S-1, S-5 and S-27. The goal of this program was the recovery and recycling of the oils and iron oxides stored in these SWMUs. The results of these field tests will continue to be evaluated in the CMS.

During the second quarter of 2000, water accumulated on S-1 was filtered and discharged to Lake Erie under a consent order with NYSDEC. Following removal of the water, representative drill core sampling of the sludge and subsequent analysis indicated that the material possessed no hazardous characteristics.

During the third quarter of 2000, approximately 1400 tons of the S-1 sludge was placed in a lined area and a rapid biological de-oiling process field demonstration was conducted by BFI/Fiton. A final report of the field demonstration project has not been issued. The results of these field tests will continue to be evaluated in the CMS.

SWMU S-2

Based on physical and chemical characterizations, it was determined that the materials in SWMU S-2 came from WQCSs No. 3, No. 7 (zinc chloride, etc.), and No. 9 (blast furnace final thickener). This determination was in agreement with the RFA listing of materials managed in this SWMU.

S-2 remained in service for roughly a 10-year period, from the early 1970s until the early 1980s, when most plant operations were discontinued. The RFA indicated that wastes normally placed in other impoundments might also have been inadvertently placed in this impoundment as well.

SWMU S-4

Surface Impoundment S-4 was built in the early 1970s as a disposal area for dredged materials from Smokes Creek (USEPA NEIC, 1988). It was used for this purpose for approximately ten years. According to the RFA, Smokes Creek received waste pickle liquor, oil, cleaning and coating solutions from the galvanizing mill; settling pit overflows from the cold strip mill, hot strip mill, and bar mill; and effluent from the south return water trench, the slabbing mill return water trench, and WQCSs Nos. 2, 3, 6, 7, and 9. According to available records, no materials have been placed in S-4 since 1980 [Preliminary SWMU Assessment Report (BSC 1992b)].

SWMU S-5

Based on early operation records and sampling and analysis, it was determined that this impoundment received mainly sand filter backwash sludges primarily from WQCS No. 6 and also from WQCS Nos. 1, 2, 4, and 5, plus waste oil from other plant operations. These sludges were black in color and contained iron oxides, rolling oils, lubricants, and water. Additional samples collected in the late 1980s and early 1990s revealed some red sludges in S-5 that were believed to be from WQCS No. 3 [basic oxygen furnace (BOF) sludge] and WQCS No. 7 (lime neutralized pickling and galvanizing lime waste waters). Two adjacent SWMUs, S-1 and S-27, were also used to store similar waste from these WQCSs.

In addition, according to the RFA, materials normally placed in other impoundments may have also been inadvertently placed into this impoundment as well. S-5 operated until about 1983, when the Lackawanna plant ceased its primary operations.

SWMU S-6

According to the RFA, materials received in this impoundment consisted of BOF final thickener from WQCS No. 3 and wastewater treatment sludge from WQCS No. 7.

In addition, according to the RFA, materials normally placed in other impoundments may have also been inadvertently placed into this impoundment as well. S-6 was used up to the early 1980s, when the major operations at the plant were shut down.

SWMU S-7/S-20

According to the RFA, wastes received in SWMU S-7/S-20 consisted of BOF final thickener (WQCS No. 3) and waters from WQCS No. 7.

Additionally, the impoundment was also used as a drying area for sludge from SWMU S-6, which contained similar materials (i.e., sludge from WQCSs Nos. 3 and 7). Drying was accomplished by piling up the materials, promoting draining, and hence drying. The purpose of the drying was to facilitate recycling of the material to the sinter plant.

According to BSC information, S-7/S-20 was used from 1978 to 1983 for management of WQCS No. 3 sludge, and subsequently, until July 1988, for management of WQCS No. 7 sludge. Furthermore, according to the RFA, wastes normally put in other impoundments may have been inadvertently put in this impoundment.

Based on the 1988 sampling and analyses, the materials in S-7/S-20 were believed to have come mainly from WQCS No. 7, however traces of blast furnace (WQCS No. 9) solids were also found to be present.

In 1989, BSC developed and implemented an interim closure plan for the unit. Closure included covering the unit with an impermeable cap and the installation of drainage controls in 1990 and 1991. The disposed material was first graded and then covered with a 6-mil synthetic sheet prior to installation of a 6-inch thick cap of a blend of Portland cement, sludge, and slag. The cap was tested and controlled to achieve a permeability of less than 1 x 10^{-7} cm/sec and an unconfined compressive strength of greater than 120 psi. Expansion/contraction joints were placed every 25 feet. The cap was constructed to provide surface drainage to an access road at the northeast end of the cap. Surface water would flow out of the bermed area via the road where it would eventually evaporate or infiltrate to adjoining surfaces. Weathering has altered the cap consistency to that of a fine to medium gravel.

SWMU S-27

BSC plant personnel indicate that dried mill sludge was, at one time, transferred from SWMU S-1, and piled in the area now designated SWMU S-27. This action was taken in order to provide additional capacity in S-1 for receiving materials from the WQCSs, which were composed mainly of mill sludge. S-5, which is adjacent to S-1, was also used to store similar waste from the WQCSs.

Based on early operations records and, sampling and analysis, it was determined that the material in this SWMU consisted primarily of iron-rich sand filtered backwash sludges primarily from WQCS No. 6 and also from WQCS Nos. 1, 2, 4, and 5, plus waste oil from other plant operations. These sludges were black in color and contained iron oxides, rolling oils, lubricants, and water. Additional samples collected in the late 1980s and early 1990s also revealed some red sludges in SWMU S-1 that were believed to be from WQCS No. 3 (BOF sludge) and WQCS No. 7 (lime neutralized pickling and galvanizing lime waste waters).

1.2.3 Deed Restriction

On February 20, 1996, BSC filed a declaration in the Erie County Clerk's office limiting future use of the property around and including SWMU Group SFA-1. Under the deed restriction, future use of the property shall be limited to industrial use only. Industrial use includes manufacturing, assembling, warehousing, and related railroad, port, and shipping activities. The deed restriction also prevents the installation and operation of extraction or water wells for purposes other than environmental remediation use. A copy of the Declaration of Conditions, Covenants and Restrictions is attached as Attachment B.

1.2.4 United States Army Corps of Engineers Dredge Spoils

Historical documents obtained from regulatory agencies, including the United States Army Corps of Engineers (USACE) show that the dredge spoils were deposited off the BSC Lackawanna facility shoreline from at least 1937 to 1948. These spoils underlie a significant portion of the SFA, including the area immediately adjacent and potentially under several SWMUs in the SWMU Group SFA-1. The potential impact to groundwater beneath the site, especially in the sand unit in the groundwater Zone 3, 4, and 5 is further assessed in the RFI.

2.0 SAMPLING AND ANALYSIS

Sampling has been conducted in Zone 2 since 1988. The sampling programs were conducted for non-RFI sampling programs (starting in 1988), as well as the RFI program (starting in 1994). The non-RFI investigations have been conducted in order to establish the potential beneficial use or waste disposal options available for the stored SWMU materials. The RFI investigations have been conducted in accordance with the Order on Consent to assess the nature and potential impact of the stored materials. This section summarizes the non-RFI investigations and in addition, details the results of the RFI investigation for the Zone 2 SWMUs listed in SWMU Group SFA-1.

2.1 Non-RFI Investigations

Numerous non-RFI investigations have been conducted on the SWMUs in order to determine both the potential waste disposal requirements and possible beneficial re-use of the materials. The investigations have included both material sampling, as well as bench scale and field scale pilot testing of treatment methods. The following list summarizes the investigations. Copies of the investigations, including analytical results, are provided in Appendix B.

List of Non RFI Investigations for SWMU Group SFA-1

Date	Investigation	SWMUs	Summary
May 17, 1988	Preliminary Report to Characterize Materials in Lackawanna Impoundments and Landfill Areas - Status Report #1 (Irons, S. D. 1988a)	S-1, S-2, S-4, S-6	Sampling on March 28-31, 1988 to determine the physical and chemical characteristics of SWMU material to develop a plan of action for recycling or disposing. Samples were analyzed for moisture content, grain size, and selected VOC, SVOC and metals. TCLP and EP Toxicity analysis on some composite samples.
June 22, 1988	Status Report #2 (Irons, S. D. 1988b)	S-1, S-2, S-4, S-6	Follow up on TCLP and EP Toxicity sampling results from May 17, 1988 investigation report.

Date	Investigation	SWMUs	Summary
February 6, 1989	Status Report #3 (Irons, S. D. 1989)	S-1, S-2, S-3, S-4, S-5, S-6, S-7/S-20	Summary of TCLP and Toxicity sampling results from August and September 1988 sampling investigation. Also discussion of bench scale test of proposed SWMU material treatment techniques including hydrocyclone testing, Davis Tube theoretical magnetic separation tests, and feasibility of microbiological treatment of hydrocarbons.
August 8, 1997	Evaluation of Screening Tests on Lackawanna S-5 Impoundment Sludge (Weidner, T. H. 1997)	S-5	Summary of pilot scale study of screening properties of SWMU S-5 materials. Test involved evaluating effectiveness of two separate screening devices. Samples collected for percent moisture and oil & grease.
February 5, 1999	Drill Core Sampling of Lackawanna Waste Management Units S-2, S-3, and S-6 (Weidner, T. H. 1999)	S-2, S-3, S-6	Report provided an estimate of volumes/tonnage of sludge in each of the three SWMUs and evaluated the materials for a Beneficial Use determination. Samples were also analyzed for total and SPLP constituent analysis, percent (%) water, % oil & grease, % iron, % zinc, % lead, % Na_2O, % K_2O, and % carbon.
June 13, 2000	Sampling of SWMU S-1 (BSC 2000)	S-1	Report of 13 samples collected for evaluation of de-oiling of sludge in SWMU S-1. Samples collected for de-oiling potential analysis, PCBs, TCLP parameters. No PCBs detected, TCLP results do not meet toxicity characteristic criteria for a RCRA hazardous waste.
June 27, 2000	SWMU S-1 Drilling and Sampling (Maxim Technologies 2000)	S-1	Maxim Technologies, Inc.'s report detailing the above referenced Investigation.

The March and August 1988 investigations indicated that none of the materials within SWMUs S-1, S-2, S-4, and S-6 meet TCLP criteria. However, analyses did indicate the presence of hazardous constituents [volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and metals] in the SWMU material.

The 1989 investigation found SWMUs S-1 and S-5 to contain materials did meet TCLP criteria. None of the materials for SWMUs S-2, S-4, S-6, or S-7/S-20 meet TCLP criteria. It should be noted that subsequent sampling conducted in 1994 and 1995 for the RFI confirmed that the materials in S-1 and S-5 were non-hazardous; the materials within this unit did not meet TCLP criteria.

The 1989 investigations also confirmed the presence of VOCs, SVOCs, and metals in SWMU S-7/S-20. In addition, the investigation indicated that proposed treatment techniques for the materials, such as magnetic separation of the metals and microbiological treatment of the petroleum based wastes may be feasible and warranted further evaluation.

Based on the 1988/89 sampling and analyses along with other BSC information, the origins of the materials in SWMU S-6 was linked to WQCSs Nos. 3 and 7. Although it was previously believed that other materials might have been inadvertently managed in SWMU S-6, the subsequent sampling and analytical results did not support this possibility.

The subsequent investigations from 1997 to 2000 further evaluated potential remedial and beneficial re-use options of the stored materials. To date, only pilot studies have been completed. Additional de-watering programs for SWMUs S-1, S-5 and S-6 are under evaluation. Potential treatment options on beneficial use determinations will be evaluated in the Corrective Measures Study (CMS).

2.2 RFI Investigations

Materials stored in SWMU Group SFA-1 in Zone 2 were assessed in three different RFI field investigations, Phase IIB, Phase IIC and Supplemental Ecological Investigation. The work was completed in accordance with the Phase IIB (BSC 1993b), Phase IIC (BSC 1994) and Supplemental Ecological Sampling (Ogden 2000) work plans. The investigation results for each SWMU are summarized below. A complete list of site-specific compounds targeted for analysis in the site investigations is provided in Table 1, followed by a listing of laboratory data qualifiers. Laboratory analytical reports are provided in Section II of the RFI. The analytical data is summarized in Tables 2 through Table 3F. Field sample records and boring logs are attached in Appendix C. Please note that the data summary tables contain compounds reported by the laboratory that are not on the site-specific hazard constituent list.

2.2.1 SWMU S-1 Sampling Phases

PHASE IIB: SWMU S-1

In June 1994, two core samples were collected from the waste in SWMU S-1. The locations of the borings are shown in Figure 2 as S-1-1 and S-1-2. One core (S-1-1) was taken to a depth of 24 feet (where slag was encountered), and the other core (S-1-2) to a depth of 8 feet (where again slag was encountered). Composite samples were collected from the full length of the cores for the analysis of SVOCs, metals, and cyanide. Grab samples were collected from the depth intervals exhibiting the highest field screening values [S-1-1 (6-8 feet) and S-1-2 (4-6 feet)] for VOC analysis. Analyses included: total constituent analysis, sample processing by the Toxicity Characteristic Leaching Procedure (TCLP) and Synthetic Precipitation Leaching Procedure (SPLP), and analysis of the resulting extracts for VOCs, SVOCs, metals and cyanide (SPLP only).

Based on observations made during Phase IIB sampling, the upper 14 feet of the impoundment materials can be described as dark gray fine, silty sand with yellow/red fine grained silty sand, changing gradually to fine to medium, silty sand to 20 feet below ground surface (bgs). The material encountered in the bottom four feet (up to 24 feet bgs) of the sample boring was gray fine to medium gravel. Strong organic/petroleum-like odors were observed throughout the boring.

PHASE IIC: SWMU S-1

In March 1995, two waste surface samples [S01-1 (0-0.5 feet) and S01-2 (0-0.5 feet)] were collected for the analysis of VOCs, SVOCs, metals, and cyanide. Sample locations are shown in Figure 2 as S01-1 and S01-2, respectively. Analyses included: Total constituent analysis, sample processing by TCLP and SPLP, and analysis of the resultant extracts for VOCs, SVOCs, metals, and cyanide (SPLP only).

2.2.1.1 SWMU S-1 Total Constituent Results

Of the site-specific hazard constituents, the results show the presence of six VOCs, eighteen SVOCs, nine metals, and cyanide in the samples. Detected VOCs ranged from 3.6 micrograms per kilogram (ug/kg) of benzene [S01-2 (0-0.5 feet)] to 12,000 ug/kg of total xylenes [S01-1 (0-0.5 feet)]. Detected SVOC ranged from 5,300 ug/kg of 3-methylphenol & 4-methylphenol [S-1-2 (0-8 feet)] to 1,900,000 ug/kg of phenanthrene [S01-2 (0-0.5 feet)]. Detected metals ranged from 0.17 milligrams per kilograms (mg/kg) of mercury [S-1-1 (0-24 feet)] to 278 mg/kg of lead [S-1-2 (0-8 feet)]. Cyanide was also detected ranging from 19.5 mg/kg [S01-2 (0-8 feet)] to 32.2 mg/kg [S01-1 (0-0.5 feet)]. Total constituent results are summarized in Table 2.

2.2.1.2 SWMU S-1 SPLP Results

SPLP analyses were conducted to mimic the effect of compounds leaching from the soil due to rainwater infiltration. The SPLP results help evaluate what compounds can potentially leach from the soils. The leaching was performed in accordance with USEPA SW846 Method 1312 protocol.

Five VOCs, twelve SVOCs, one metal, and cyanide were detected in the SWMU S-1 SPLP extracts. Detected VOC ranged from 0.011 milligrams per liter (mg/L) of ethylbenzene [S01-1 (0-0.5 feet)] to 0.048 mg/L total xylenes [S01-1 (0-0.5 feet)]. Detected SVOC ranged from 0.008 mg/L of naphthalene [S01-1 (0-0.5 feet)] to 0.87 mg/L of phenol [S-1-1 (0-24 feet)]. Antimony was the only metal detected at 0.17 mg/L [S-1-2 (0-8 feet)]. Cyanide was also detected at 0.055 mg/L [S-1-2 (0-8 feet)]. The SPLP analytical results are summarized in Table 2. It should be noted that SPLP metals (except mercury) for S01-1 and SPLP SVOCs for S01-2 (Phase IIC samples) were not analyzed.

2.2.1.3 SWMU S-1 TCLP Results

TCLP results were compared to regulatory concentration levels as listed in 40 CFR Part 261. The TCLP extract concentrations indicate that the materials in SWMU S-1 do not meet TCLP criteria. Results of the TCLP analysis are summarized in Table 3.

2.2.2 SWMU S-2 Sampling Phases

PHASE IIB: SWMU S-2

In June 1994 waste samples were collected as part of the Phase IIB investigation. This involved the collection of a full-length core (boring S02) near the approximate center of the SWMU S-2 unit as shown in Figure 3, to a depth of 26 feet where slag was encountered. A composite sample was collected from the full length of the core run and analyzed for SVOCs, metals, and cyanide analysis. A grab sample was collected from the depth interval (12-14 feet) exhibiting the highest field screening value for VOCs analysis.

Based on observations made during Phase IIB sampling, the upper 13 feet of the impoundment materials can be described as thin (less than 2 feet in thickness) zones of fine-grained material, similar in structure and consistency to a silty sand, and varying in color (brown, yellowish red, and dark gray). The material encountered in the bottom half of a sample boring (overlying slag) was dark gray in color and similar to a fine-grained silty sand and silt, with strong petroleum-like odors.

PHASE IIC: SWMU S-2

In February 1995, waste samples were collected as part of the Phase IIC investigation. Two surface grab samples [S02-1 (0-0.5 feet) and S02-2 (0-0.5 feet)] and one core sample [S02-3 (0-27.3 feet)] were collected to aid in assessing potential health risk and exposure pathways. The sample locations are shown as S02-1, S02-2, and S02-3 in Figure 3. The surface grab samples were analyzed for VOCs, SVOCs, metals, and cyanide. The core was advanced to a depth of 27.3 feet where slag was encountered. A composite sample was taken from the full length of the core for SVOCs, metals, and cyanide analysis. A grab sample was collected from the depth interval having the highest field screening values (16-18 feet) for VOCs analysis.

Laboratory analysis of the core and grab samples from both Phase IIB and IIC consisted of total constituent analysis, sample processing by TCLP and SPLP, and analysis of the extracts for VOCs, SVOCs, metals and cyanide (SPLP only). It should be noted that the SPLP SVOCs, SPLP metals (except mercury), and SPLP cyanide for S02-1 and S02-2 were not analyzed. Total cyanide for S02 and SPLP cyanide for S02-3 also were not analyzed.

Surface materials collected during the Phase IIC investigation were described as black, fine-grained, and similar in structure and consistency to a mixture of clay, sand, and silt. The material exhibited a petroleum-like odor, and a sheen was observed in saturated samples. The subsurface materials were similar in nature but were red to brown in color and exhibited no sheen.

2.2.2.1 SWMU S-2 Total Constituent Results

Seven VOCs, eight SVOCs, twelve metals, and cyanide were detected in the samples. Detected VOCs ranged from 5.0 ug/kg of 1,2-dichlorothane [S02-3 (16-18 feet)] to 340 ug/kg of total xylenes in [S02-3 (16-18 feet)]. Detected SVOCs ranged from 92 ug/kg ideno(1,2,3-cd) pyrene [S02-1 (0-0.5 feet)] to 2,600 ug/kg of naphthalene [S02-3 (0-27.3 feet)]. With the exception of salts (i.e., calcium, magnesium, potassium and sodium) and iron, detected metals ranged from 0.16 mg/kg of mercury [S02-3 (0-27.3 feet)] to 1,630 mg/kg of lead [S02 (0-26 feet)]. Cyanide was only detected in S02-3 (0-27.3 feet) at a concentration of 24.2 mg/kg. Analytical results for total constituents in the solid phase samples are summarized in Table 2A.

2.2.2.2 SWMU S-2 SPLP Results

Analysis of the SPLP extract from the samples indicates the presence of three VOCs, one SVOC, and one metal. Detected VOCs ranged from 0.0026 mg/L of toluene [S02-1 (0-0.5 feet)] to 0.04 mg/L of methylene chloride [S02 (12-14 feet)]. One SVOC, naphthalene, was detected at a concentration of 0.21 mg/L [S02-3 (0-27.3)]. Calcium, the only metal detected was at 20.9 mg/L [S02-3 (0-27.3 feet)]. SPLP results are summarized in Table 2A.

2.2.2.3 SWMU S-2 TCLP Results

TCLP results were compared to regulatory concentration levels as listed in 40 CFR Part 261. The TCLP extract concentrations indicate that the materials in SWMU S-2 do not meet TCLP criteria. Results of the TCLP analysis are summarized in Table 3A.

2.2.3 SWMU S-4 Sampling Phases

PHASE IIB: SWMU S-4

In June 1994, as part of the Phase IIB RFI, a core was collected from the approximate center of the unit to a depth of 36 feet, where slag was encountered. The boring is identified as S04 as shown in Figure 4. A composite sample was collected from the full length of the core for SVOCs, metals, and cyanide analysis. A grab sample was taken from the area having the highest field screening value (22-24 feet) for VOCs analysis. Laboratory analyses included: total constituent analysis and sample processing by the SPLP and analysis of the resulting extract. Although the samples are of the waste material, TCLP extraction and analysis was not performed on the samples collected during the June 1994 event.

Subsurface materials collected from the Phase IIB boring in June 1994, were described as dark gray sandy silt to silty sand overlying approximately three feet of silty clay and slag.

PHASE IIC: SWMU S-4

During the Phase IIC investigation, five waste samples were collected: three surface samples and two core samples (Figure 4). The three surface grab samples S04-1, S04-2 and S04-3 were collected for VOCs, SVOCs, metals, and cyanide analysis. Core sample S04-4 was collected to a depth of 36 feet and core sample S04-5 was collected to a depth of 38 feet. Slag was encountered at the bottom of each borehole. Composite samples were collected from the full length of each core for SVOCs, metals, and cyanide analysis. A field duplicate of sample S04-5 [S04-6 (0-38 feet)] was also collected. Grab samples were collected from the depth intervals having the highest field PID screening values at S04-4 (20-22 feet), and S04-5 (26-30 feet) for

VOCs analysis. A field duplicate of sample S04-5 [S04-6 (26-30 feet)] was collected for VOCs analysis. Analyses included: total constituent analysis and sample processing by the TCLP and SPLP methods and analysis of the extracts for VOCs, SVOCs, metals, and cyanide (SPLP only).

From observations made during Phase IIC sampling, the surface material was described as brown silt with traces of clay, fine sand, and roots (similar to topsoil). No unusual odors were noted; however, at depth, core samples exhibited petroleum-like and tar-like odors. The subsurface materials encountered in the cores were described as dark brown, dark gray-brown, or reddish-brown in color having a consistency similar to silty clay to clayey silt.

2.2.3.1 SWMU S-4 Total Constituent Results

Analysis of samples indicates six VOCs, eighteen SVOCs, twelve metals and cyanide were detected. Detected VOCs ranged from 8 ug/kg of toluene [S04-4 (20-22 feet)] to 5,300 ug/kg of total xylenes [S04 (22-24 feet)]. Detected SVOCs ranged from 120 ug/kg of 2,4-dimethylphenol [S04-6 (0-38 feet)] to 36,000 ug/kg of naphthalene [S04 (0-36 feet)]. With the exception of salts and iron, detected metals ranged from 0.15 mg/kg of mercury [S04-6 (0-38 feet)] to 203 mg/kg of chromium [S04-5 (0-38 feet)]. Cyanide was also detected in the samples ranging from 5 mg/kg [S04 (0-36 feet)] to 23.4 mg/kg [S04-6 (0-38 feet)]. No VOCs were detected in the surficial samples (S04-1 and S04-2). Analytical results for total constituents in the solid phase samples are summarized in Table 2B.

2.2.3.2 SWMU S-4 SPLP Results

Analyses of the samples indicate the presence of six VOCs, two SVOCs, four metals, and cyanide. The SPLP extracts from the surficial grab samples (S04-1, S04-2, and S04-3) were not analyzed for SVOCs. S04 was the only sample analyzed for SPLP cyanide. Detected VOCs ranged from 0.002 mg/L of trichloroethane [S04-6 (26-30 feet)] to 0.54 mg/L of benzene [S04-4 (20-22 feet)]. Detected SVOCs ranged from 0.002 mg/L of 3-methylphenol & 4-methylphenol [S04-6 (0-38 feet)] to 0.005 mg/L of 2,4-dimethylphenol [S04-5 (0-38 feet)]. With the exception of salts, the only metal detected was lead, ranging from 0.004 mg/L [S04-6 (0-38 feet)] to 0.005 mg/L [S04-3 (0-0.5 feet)]. Cyanide, only analyzed in S04 (0-36 feet) was detected at 0.028

mg/L. Two VOCs, 1,1,1-trichloroethane and trichloroethene, were detected in the SPLP analysis but were not detected in the total constituent analysis. Analytical results are summarized in Table 2B.

2.2.3.3 SWMU S-4 TCLP Results

TCLP results were compared to regulatory concentration levels as listed in 40 CFR Part 261. It should be noted that one VOC, 1,1,1-trichloroethane, and several SVOCs were detected in the TCLP analysis but were not detected in the total constituent analysis. The TCLP extract concentrations indicate that the materials in SWMU S-4 do not meet TCLP criteria. Results of the TCLP analysis are summarized in Table 3B.

2.2.4 SWMU S-5 Sampling Phases

PHASE IIB: SWMU S-5

In order to further determine whether the materials in SWMU S-5 contained hazardous constituents, additional sampling of this impoundment was included in a Phase IIB investigation conducted in June 1994. Two full-length cores, shown in Figure 5, were collected to depths of 21.5 feet (S05-1) and 21 feet (S05-2), where slag was encountered. Composite samples were collected from the full length of core obtained at each boring for the analysis of SVOCs, metals, and cyanide. Grab samples were collected from sample intervals having the highest field screening values [S05-1 (10-12 feet) and S05-2 (18-20 feet)] for the analysis of VOCs. Laboratory testing included: total constituent analysis, sample processing by TCLP and SPLP methods, and analysis of the extracts for VOCs, SVOCs, metals, and cyanide (SPLP only).

Materials encountered at both of the Phase IIB boring locations were found to consist of: dark gray silty sand-like and clayey silt-like material, overlying greenish gray fine gravel and fine sand-like material containing slag. At the south end, the impoundment was approximately 21 feet deep and was assumed to be relatively level from east to west.

PHASE IIC: SWMU S-5

In February 1995, during the Phase IIC investigation, two grab samples of surface material (0-0.5 feet) were collected for the analysis of VOCs, SVOCs, metals, and cyanide. Based on observations made during the Phase IIC sampling, the surface material was described as a moist, black sludge. Grab sample locations S05-1 (IIC) and S05-2 (IIC) are shown in Figure 5.

2.2.4.1 SWMU S-5 Total Constituent Results

Analysis of the samples indicated the presence of seven VOCs, eight SVOCs, and eight metals. Cyanide was not detected. Detected VOCs ranged from 2.2 ug/kg of carbon disulfide [S05-1 (IIC) (0-0.5 feet)] to 12,000 ug/kg of toluene [S05-2 (18-20 feet)]. Detected SVOCs ranged from 12,000 ug/kg of phenol [S05-1 (0-21.5 feet)] to 1,600,000 ug/kg of naphthalene [S05-2 (0-21 feet)]. With the exception of salts and iron, detected metals ranged from 0.27 mg/kg of mercury [S05-2 (0-21 feet)] to 264 mg/kg of lead [S05-2 (0-21 feet)]. Total Constituent analytical results are summarized in Table 2C.

2.2.4.2 SWMU S-5 SPLP Results

Analyses of the samples indicate the presence of five VOCs, six SVOCs, and cyanide. No metals were detected. Detected VOCs ranged from 0.003 mg/L of toluene [S05-1 (IIC) (0-0.5 feet)] to 0.77 mg/L of total xylenes [S05-2 (18-20 feet)]. Detected SVOCs ranged from 0.16 mg/L of 2,4 dimethylphenol [S05-1 (0-21.5 feet)] to 0.89 mg/L of phenol [S05-2 (0-21 feet)]. Cyanide was detected in two samples: 0.017 mg/L in S05-1 (0-21.5 feet) and 0.24 mg/L in S05-2 (0-21 feet). It should be noted that cyanide was not detected in the total constituent analysis. SPLP results are summarized in Table 2C.

2.2.4.3 SWMU S-5 TCLP Results

TCLP results were compared to regulatory concentration levels as listed in 40 CFR Part 261. The TCLP extract concentrations indicate that the material in SWMU S-5 do not meet TCLP criteria. TCLP results are summarized in Table 3C.

2.2.5 SWMU S-6 Sampling Phases

PHASE IIB: SWMU S-6

In June 1994, one core was collected from boring location S06 (see Figure 6), to a depth of 33.7 feet, where slag was encountered. A composite sample was collected from the entire length of the core for analysis of SVOCs, metals and cyanide. A grab sample was additionally collected from the interval having the highest field PID screening value (14-16 feet) for the analysis of VOCs. Analyses included total constituent analysis, sample processing by TCLP and SPLP, and analysis of the resulting extracts for VOCs, SVOC, metals and cyanide (SPLP only).

During the Phase IIB RFI, subsurface materials in SWMU S-6 were described as a yellowish to red silty sand and clayey silt-like material grading to dark brown with depth. Slag was encountered at approximately 34 feet below grade.

PHASE IIC: SWMU S-6

In February 1995, two grab samples of surface material (0-0.5 feet) were collected at boring locations S06-1 and S06-2, and one core was collected at boring location S06-3, as shown on Figure 6. The core was collected to a depth of 24.8 feet, where slag was encountered. The surface samples were analyzed for VOCs, SVOCs, metals, and cyanide. A composite sample from the full length of the core (0-24.8feet) was collected for the analysis of SVOCs, metals, and cyanide. A grab sample was collected from the depth interval having the highest field screening value (12-14 feet) for the analysis of VOCs. Analyses included total constituent analysis, sample processing by TCLP and SPLP methods, and analysis of the extracts for VOCs, SVOC, metals and cyanide (SPLP only). It should be noted that the SPLP extracts of surface samples S06-1 and S06-2 for SVOCs, metals, and cyanide were not analyzed.

2.2.5.1 SWMU S-6 Total Constituent Results

Analysis of the samples detected seven VOCs, eight SVOCs, eight metals, and cyanide. Detected VOCs ranged from 25 ug/kg of trichloroethene to 680 ug/kg of benzene, both in S06-3 (12-14 feet). Detected SVOCs ranged from 120 ug/kg of benzo(ghi)perylene [S06-2 (0-0.5 feet)] to 350,000 ug/kg of naphthalene [S06-3 (0-24.8 feet)]. With the exception of salts and iron, detected metals ranged from 5.9 mg/kg of thallium [S06 (0-33.7 feet)] to 3,670 mg/kg of lead [S06-2 (0-0.5 feet)]. Cyanide was only detected in S06-3 (0-24.8 feet) at 3 mg/kg. Total constituent analytical results are summarized in Table 2D.

2.2.5.2 SWMU S-6 SPLP Results

Analyses of the samples detected seven VOCs, two SVOCs, three metals, and cyanide. Detected VOCs ranged from 0.001 mg/L of ethylbenzene to 0.42 mg/L of benzene, both in S06-3 (12-14 feet). Detected SVOCs ranged from 0.005 mg/L of naphthalene [S06 (0-33.7 feet)] to 5.6 mg/L of naphthalene [S06-3 (0-24.8 feet)]. With the exception of salts and iron, detected metals ranged from 0.011 mg/L of arsenic to 0.019 mg/L of lead, both in S06-3 (0-24.8 feet). Cyanide was detected only in S06 (0-33.7 feet) at 0.012 mg/L. Analytical results are summarized in Table 2D.

2.2.5.3 SWMU S-6 TCLP Results

TCLP results were compared to regulatory concentration levels as listed in 40 CFR Part 261. The TCLP extract concentrations indicate that the materials in SWMU S-6 do not meet TCLP criteria. TLCP analytical results are summarized in Table 3D.

2.2.6 SWMU S-7/S-20 Sampling Phases

PHASE IIB: SWMU S-7/S-20

Analytical data was collected during a Phase IIB RFI in June 1994 to evaluate requirements for future investigations and to assess potential impacts of the material to human health and the environment. Coring was performed at location S07 (Figure 7) from ground surface to a depth of 41.8 feet. During drilling, a distinct change in the nature of subsurface materials was noticed at about 30 feet (as anticipated, based upon the reported operating history of the unit) where slag was encountered. Therefore, it was decided to consider the material as two cores, one from 0 to 30 feet [S07 (0-30 feet)], and the other from 30-41.5 feet [S07 (30-41.5 feet)]. Composite samples from the full length of each core were analyzed for SVOCs, metals, and total cyanide. Grab samples were collected from depth interval having the highest volatile field PID screening value in each core [S07 (22-24 feet) and S07 (32-34 feet)] and analyzed for VOCs. Analyses included total constituent analysis, sample processing by TCLP and SPLP, and analysis of the resulting extracts for VOCs, SVOC, metals and cyanide (SPLP only).

From observations made during the Phase IIB boring, the upper layer (0-30 feet) was described as a yellowish to red fine-grained, silty sand and clayey silt-like material with thin (less than 0.5-foot) veins of dark brown to gray, fine-grained, silty sand-like material. In addition, a petroleum-based product was observed in the upper layer at approximately 19 feet to 23 feet below ground surface. The deeper layer (30-41.5 feet) was described as a dark gray, fine- to coarse-grained silty sand-like slag with some clayey silt-like material. No petroleum-based product was observed in this deeper layer.

PHASE IIC: SWMU S-7/S-20

In February 1995, one core [sample S07-1 (0-30 feet)] was collected at the location shown as S07-1 in Figure 7. The boring was drilled to a total depth of 28 feet below grade, slag fill was encountered at approximately 23 feet below grade. A composite sample from the full length of the core was collected for SVOCs, metals, and cyanide analysis. A grab sample was collected from the depth interval showing the highest field PID screening value [S07-1 (6-10 feet)] for VOCs analysis. Analyses included total constituent analysis, sample processing by TCLP and SPLP, and analysis of the resultant extracts for SVOCs, metals and cyanide (SPLP only). It should be noted that TCLP VOC and SPLP VOC analyses were not performed in Phase IIC.

Materials encountered during the boring drilled during Phase IIC consisted predominantly of reddish-brown silty clay with dark brown or gray seams of fine sand or silt. An unidentified chemical odor was observed at 2 feet and also from 17 through 21 feet below grade.

SUPPLEMENTAL ECOLOGICAL SAMPLING

As part of the Supplemental Ecological Investigation conducted for the RFI, four surface (0-6 inches) soil samples (AMEC S7A, AMEC S7B, AMEC S20A, and AMEC S20B) were collected from SWMU S-7/S-20 in 2001. The samples were collected by AMEC Earth & Environmental (AMEC) and analyzed for Total Constituent analysis of VOCs, SVOCs, metals, and cyanide. Samples collected from SWMU S-20 (AMEC S20A and AMEC S20B) consisted of reddish brown material. Samples collected from SWMU S-7 (AMEC S7A and AMEC S7B) also consisted of reddish-brown material.

2.2.6.1 SWMU S-7/S-20 Total Constituent Results

Analysis of the samples detected six VOCs, sixteen SVOCs, eight metals, and cyanide. Detected VOCs ranged from 6.6 ug/kg of methylene chloride [S07-1 (6-10 feet)] to 190 ug/kg of total xylenes [S07 (22-24 feet)]. Detected SVOCs ranged from 87 ug/kg of acenaphthene [S07 (30-41.5 feet)] to 21,000 ug/kg of naphthalene [S07 (0-30 feet)]. With the exception of salts and iron, detected metals ranged from 0.16 mg/kg of mercury [S07 (30-41.4 feet)] to 859 mg/kg of lead [S07 (0-30 feet)]. Cyanide was detected in S07 ranging from 0.65 mg/kg (30-41.5 feet) to 1.2 mg/kg (0-30 feet). Total constituent analytical results are summarized in Table 2E.

Analysis of the AMEC samples (S7A, S7B, S20A, and S20B) detected one VOC, six SVOCs, twelve metals, and cyanide. The VOC, trichloroethene was detected at a concentrations ranging from 4.6 ug/kg (AMEC S20A) to 15 ug/kg (AMEC S20B). The six SVOCs ranged from 43 ug/kg of chrysene (AMEC S7A) to 83 ug/kg of fluoranthene (AMEC S7B). With the exception of salts and iron, metals ranged from 0.03 mg/kg of mercury (AMEC S7B) to 968 mg/kg of lead (AMEC S20A). Cyanide was detected in all four samples ranging from 0.78 mg/kg in (AMEC S20A) to 1.5 mg/kg (AMEC S7B). Analytical Results are provided in Table 2E.

2.2.6.2 SWMU S-7/S-20 SPLP Results

Analysis of the samples detected four VOCs, two SVOC, one metal, and cyanide. Detected VOCs ranged from 0.02 mg/L of trichloroethene [S07 (22-24 feet) and S07 (32 to 34 feet)] to 0.05 mg/L of total xylenes [S07 (22-24 feet)]. Detected SVOCs ranged from 0.014 mg/L of 3-methylphenol & 4-methylphenol [S07-1 (0-30 feet)] to 0.65 mg/L of naphthalene [S07 (0-30 feet)]. Calcium was the only metal detected. Cyanide was detected in only one sample at a concentration of 0.11 mg/L [S07 (30-41.5 feet)]. It should be noted that trichloroethene, a VOC and 3-methylphenol & 4-methylphenol, a SVOC, detected in the SPLP analyses were not detected in the total constituent analyses. SPLP analytical results are summarized in Table 2E.

2.2.6.3 SWMU S-7/S-20 TCLP Results

TCLP results were compared to regulatory concentration levels as listed in 40 CFR Part 261. The TCLP extract concentrations indicate that the materials in SWMU S-7/S-20 do not meet TCLP criteria. It should be noted that 1,1,2,2-tetrachloroethane, a VOC, and 2,4-dimethylphenol and 3-methylphenol & 4-methylphenol, three SVOCs, detected in the TCLP analyses were not detected in the total constituent analyses. The TCLP analytical results are summarized in Table 3E.

2.2.7 SWMU S-27 Sampling Phases

PHASE IIB: SWMU S-27

In June of 1994, sampling was conducted to characterize the materials in SWMU S-27. One surface (i.e., grab) sample was collected at the location shown in Figure 8. The sample was collected from the ground surface to an approximate depth of six inches for the total constituent analysis of VOCs, SVOCs, metals, and cyanide. The sample was also processed by TCLP and SPLP and the resultant extracts analyzed for VOCs SVOCs, metals, and cyanide (SPLP only).

Observations recorded during the Phase IIB sampling indicated that the surface material was a dark gray, fine- to medium-grained, silty sand. Trace amounts of fine gravel, slag fragments, and oil-based material were also present.

PHASE IIC: SWMU S-27

No samples were collected in SWMU S-27 during Phase IIC of the RFI.

SUPPLEMENTAL ECOLOGICAL SAMPLING

As part of the Supplemental Ecological Investigation conducted for the RFI, two surface (0-6 inches) soil samples (AMEC S27A and AMEC S27B) were collected from SWMU S-27 in 2001. The samples were collected by AMEC and analyzed for Total Constituent analysis of VOCs, SVOCs, metals, and cyanide. The samples consisted of silty fine sand and were black (AMEC S27A) and brown (AMEC S27B) in color.

2.2.7.1 SWMU S-27 Total Constituent Results

Analysis of the sample (S27) indicated the presence of two SVOCs, benzo(b)fluoranthene at 2,000 ug/kg, and benzo(a)anthracene at 3,200 ug/kg, seven metals, and cyanide at 7.4 mg/kg. No VOCs were detected. Detected metals ranged from mercury (0.77 mg/kg) to lead (169 mg/kg). Analytical results are presented in Table 2F.

Analysis of the AMEC S27A and AMEC S27B detected one VOC, seven SVOCs, twelve metals, and cyanide. The VOC, trichloroethene was detected at a concentration of 7 ug/kg (AMEC S27A). The seven SVOCs ranged from 250 ug/kg of acenaphthylene (AMEC S27B) to 14,000 ug/kg of benzo(a)pyrene (AMEC S27A). The highest concentrations of SVOCs were detected in AMEC S27A. With the exception of salts and iron, metals ranged from 0.31 mg/kg of mercury to 189 mg/kg of lead, both detected in AMEC S27B. Cyanide was detected in both samples at a concentration of 5.4 mg/kg. Analytical Results are provided in Table 2F.

2.2.7.2 SWMU S-27 SPLP Results

No analytes were detected in the SPLP extracts.

2.2.7.3 SWMU S-27 TCLP Results

TCLP results were compared to regulatory concentration levels as listed in 40 CFR Part 261. The TCLP extract concentrations indicate that the materials in SWMU S-27 do not meet TCLP criteria. It should be noted that benzene was detected in the TCLP analysis of VOCs, but was not detected in the total constituent VOC analysis. The analytical results are summarized in Table 3F.

2.3 Groundwater Sampling

All groundwater sampling was conducted in accordance with: HWM-1 and HWM-2 Groundwater Quality Assessment Plan (for SWMU S-3) (BSC 1987), Phase I Work Plan, (BSC 1990a) Data Collection Quality Assurance Plan (BSC 1990b), Phase IIB Work Plan (BSC 1993b), the Natural Attenuation Phase 2 Groundwater Study Work Plan (BSC 1997), and Comprehensive Well Sampling (BSC 1999c).

Thirteen groundwater monitoring wells MWS-09, MWS-26A, MW-2U1, MW-2U1B, MWS-01, MWS-01B, MWS-15, MWS-13, MWS-12A, MWS-12B, MWS-29A, MWS-14 and MWS-14B are located within the SWMU Group SFA-1 area. Figure 9 shows the location of all monitoring wells. With the exception of MW-2U1B, MWS-01B, and MWS-14B, which are screened in the deeper sand unit, the monitoring wells are screened in the fill unit. Monitoring wells MW-2D4, MW-2D3, MW-2D2, MW-2D2B were not used because they are directly downgradient of SWMU S-3. MWS-28A and MWS-28B were never sampled. Monitoring well MWS-11A is crossgradient of SWMUs S-7/S-20, S-8, and S-4. Because of its crossgradient location, the data was not used to evaluate the SWMU.

Monitoring well locations along with a groundwater contour map of the fill unit are shown in Figure 10. A groundwater contour map of the sand unit that underlies the fill unit is shown in Figure 11. The direction of groundwater flow in the fill unit and sand unit is west, toward Lake Erie.

Due to the proximity of other SWMUs within SWMU Group SFA-1 and the adjacent SWMUs in Zone 2 (SWMU S-3 and S-8), for the purpose this discussion the SWMUs have been divided into three study areas, Area 1, Area 2, and Area 3.

Area 1 evaluates groundwater conditions in and around SWMUs S-1, S-2, S-5, S-6, and S-27. These SWMUs are surrounded by downgradient groundwater monitoring wells MWS-09 and MWS-26A; and upgradient wells MWS-13, MWS-12A, and MWS-12B. In addition, well MWS-15 is downgradient to SWMU S-6 and crossgradient to SWMU S-5.

Area 2 evaluates groundwater conditions in and around SWMU S-7/S-20. Downgradient wells, MW-2U1, MW-2U1B, and upgradient well MWS-29A were used in the evaluation. Please note that monitoring well MWS-29A was installed in 2000.

Area 3 evaluates groundwater conditions in and around SWMUs S-4 and S-8. Downgradient groundwater monitoring wells, MWS-01 and MWS-01B and upgradient wells MWS-14 and MWS-14B were used in the evaluation.

The wells in Zone 2 have been sampled sporadically since the 1980's. The November 1999 sampling event is the only event in which all wells were sampled concurrently (except MW-2U1 and MWS-29A). MW-2U1 was dry in November 1999 and MWN-29A was installed in 2000. Therefore, the November 1999, December 2000 and MW-2U1's April 1999 sampling events were used to evaluate potential groundwater impact from the materials stored in the SWMUs. A summary of the results of all sampling events is summarized in Table 4. Table 4A presents the data for only the 1999-2000 sampling event.

2.3.1 Groundwater Results

AREA 1

In Area 1, VOCs, SVOCs, metals, and cyanide were detected. Six VOCs were detected ranging from 1.3 micrograms per liter (ug/L) of toluene and 1,1-dichloroethane in upgradient well MWS-12B to 55 ug/L of benzene in upgradient well MWS-12A. The third upgradient well, MWS-13, located immediately east of SWMU S-6, had only one detectable VOC (1,1-dichloroethane at 1.5 ug/L). MWS-15, downgradient to SWMU S-6 (and well MWS-13) had four of the six detected VOCs, ranging from 2.2 ug/L of toluene to 6.7 ug/L of ethylbenzene. No VOCs were detected in downgradient well MWS-09 (immediately adjacent to SWMU S-1), although four VOCs were detected in the other downgradient well MWS-26A, ranging from 1.7 ug/L of toluene to 37 ug/L of total xylenes.

Ten SVOCs were detected ranging from 1.2 ug/L of pyrene in upgradient well MWS-12A and 1.2 ug/L of fluoranthene in cross/downgradient well MWS-15, to 200 ug/L of naphthalene in upgradient well MWS-12B. The highest concentration and largest number of SVOCs were detected MWS-12A. The third upgradient well, MWS-13 had only one detected SVOC (naphthalene at 3.2 ug/L). MWS-15, downgradient to SWMU S-6 had five detected SVOCs ranging from 1.2 ug/L of fluoranthene to 44 ug/L of naphthalene. No SVOCs were detected in downgradient well MWS-09, although five SVOCs were detected in downgradient well MWS-26A, ranging from 1.6 ug/L of fluoranthene to 43 ug/L of naphthalene.

Fifteen metals were detected in Area 1, with concentrations ranging from 0.083 ug/L of mercury in MWS-12A to 1,500,000 ug/L of calcium in MWS-12B. The highest concentrations of metals were detected in upgradient well MWS-12B. The upgradient wells had fourteen metals detected. With the exception of the salts (i.e., calcium, magnesium, potassium, sodium) and iron, concentrations ranged from 0.083 ug/L of mercury to 776 ug/L of barium. Eight metals were detected in cross/downgradient well MWS-15. With the exception of salts and iron, concentrations ranged from 1.5 ug/L of chromium to 57.1 ug/L of barium. Eleven metals were detected in downgradient wells MWS-09 and MWS-26A. With the exception of the salts and iron, concentrations ranged from 3.6 ug/L of arsenic to 40.4 ug/L of barium.

Eleven dissolved metals were detected in upgradient wells MWS-12A and MWS-12B. With the exception of the salts and iron, concentrations ranged from 0.089 ug/L of mercury in MWS-12A to 680 ug/L of barium in MWS-12B. The highest concentrations of dissolved metals were detected in upgradient well MWS-12B. Eleven dissolved metals were detected in downgradient well MWS-09. With the exception of the salts and iron, concentrations ranged from 0.29 ug/L of cadmium to 34.3 ug/L of barium. Dissolved metals were not analyzed for in the upgradient well, MWS-13 or cross/downgradient well MWS-15.

Cyanide was detected in upgradient wells MWS-12A, MWS-12B, and MWS-13 ranging from 0.62 mg/L to 0.15 mg/L. Cyanide was detected in downgradient well MWS-26A at 0.011 mg/L. Cyanide was not detected in downgradient well MWS-09 or cross/downgradient well MWS-15.

AREA 2

In Area 2, VOCs, SVOCs, metals and cyanide were detected. Seven VOCs were detected in downgradient wells MW-2U1 and MW-2U1B. VOCs ranged from 1.1 ug/L of methylene chloride to 73 ug/L of total xylenes, both detected in MW-2U1. The majority of the VOCs were detected in the fill zone well MW-2U1. One VOC was detected in the upgradient well MWS-29A (benzene at 2.4 ug/L).

Eleven SVOCs were detected in the downgradient wells, ranging from 2.1 ug/L of pyrene in MW-2U1 to 2,600 ug/L of phenol in MW-2U1B. No SVOCs were detected in upgradient well MWS-29A.

Nine metals were detected in downgradient wells MW-2U1 and MW-2U1B. With the exception of the salts and iron, concentrations ranged from 0.075 mg/L of mercury to 9,860 mg/L of barium, both detected in MW-2U1B. Eleven metals were detected in upgradient well MWS-29A. With the exception of the salts and iron, concentrations ranged from 2.4 ug/L of silver to 47.9 ug/L of barium. Although more metals were detected in the upgradient well, metals were detected at higher concentrations in the downgradient wells.

Eleven dissolved metals were detected in downgradient wells MW-2U1 and MW-2U1B. With the exception of the salts and iron, concentrations ranged from 0.13 ug/L of mercury to 9,850 ug/L of barium, both detected in MW-2U1B. Ten dissolved metals were detected in upgradient well MWS-29A. With the exception of the salts and iron, concentrations ranged from 7.3 ug/L of selenium to 45.9 ug/L of barium. The majority and higher concentrations of dissolved metals were detected in downgradient well MW-2U1B. Cyanide was not detected in the downgradient wells. Cyanide was detected at 0.024 mg/L in upgradient well MWS-29A.

AREA 3

In Area 3, VOCs, SVOCs, metals, and cyanide were detected. Five VOCs were detected in the downgradient wells MWS-01 and MWS-01B. VOCs ranged from 2.7 ug/L of 1,1-dichloroethane to 350 ug/L of total xylenes, both in MWS-01. Six VOCs were detected in upgradient wells MWS-14 and MWS-14B. Concentrations ranged from 1.2 ug/L of methylene chloride in MWS-14 to 42 ug/L of benzene in sand zone well MWS-14B. The majority of the VOCs and the highest concentration of VOCs were in the downgradient fill zone well MWS-01.

Twelve SVOCs were detected in downgradient wells MWS-01 and MWS-01B. SVOCs ranged from 1.1 ug/L of benzo(a)anthracene in MWS-01B to 1,000 ug/L of naphthalene in MWS-01. Twelve SVOCs were detected in upgradient wells MWS-14 and MWS-14B. SVOCs ranged from 1.4 ug/L of benzo(a)anthracene in MWS-14 to 670 ug/L of naphthalene in MWS-14B. The majority of the SVOCs were detected in downgradient well MWS-01B; however, the highest concentrations of SVOCs were detected in downgradient well MWS-01.

Fourteen metals were detected in downgradient wells MWS-01 and MWS-01B. With the exception of the salts and iron, concentrations ranged from 0.077 ug/L of mercury to 1,620 ug/L of barium, both in MWS-01B. Thirteen metals were detected in upgradient wells MWS-14 and MWS-14B. With the exception of the salts and iron, concentrations ranged from 0.083 ug/L of mercury to 423 ug/L of barium, both in MWS-14B. The majority and highest concentrations of metals were detected in downgradient well MWS-01B.

Ten dissolved metals were detected in downgradient well MWS-01 and MWS-01B. With the exception of the salts and iron, concentrations ranged from 0.73 ug/L of chromium to 1,520 ug/L of barium, both in MWS-01B. Eleven dissolved metals were detected in upgradient wells MWS-14 and MWS-14B. With the exception of the salts and iron, concentrations ranged from 0.26 ug/L of cadmium to 782 ug/L of barum, both in MWS-14. The majority of the dissolved metals were detected in the upgradient wells, with higher concentrations in the downgradient wells.

Cyanide was detected in both downgradient wells at 0.12 mg/L (MWS-01) and 0.10 mg/L (MWS-01B). Cyanide was only detected in upgradient well MWS-14B at 0.010 mg/L.

2.4 Summary of Analytical Results

TCLP extract concentrations indicate that the materials in the Zone 2 SWMUs do not meet TCLP criteria. Several VOCs, SVOCs, metals, and cyanide were detected in the samples collected from the Zone 2 SWMUs. In general, the highest concentrations of analytes in each of the SWMUs were SVOCs.

In Area 1, up to seven VOCs, eighteen SVOCs, and eighteen metals were detected in the SWMUs in the Total Constituent analysis. The SPLP soil analytical data suggests that these materials contained in one or more of the SWMUs have a potential to leach.

The compounds detected in the SPLP analysis from Area 1 represent the compounds of most concern. These analytes were compared to the 1999 and 2000 groundwater sampling results for both upgradient and downgradient wells. Many of the VOCs were detected at higher concentrations in the SPLP (compounds of concern) analysis than in either the upgradient or downgradient wells. The majority of the VOCs detected in the downgradient wells were higher in concentration than in the upgradient wells. Many of the SVOCs were also detected at higher concentrations in the SPLP analysis than in the upgradient or downgradient wells. The concentrations of the SVOCs in the upgradient and downgradient wells are varied with no definitive trend in downgradient concentration. Metals concentrations in the vicinity of Area 1 were varied in concentration and could not be sourced to Area 1.

Historical documentation shows that from at least 1937 to 1948, US Army Corps of Engineers (USACE) dredge spoils obtained from the Buffalo River and Outer harbor were placed in Lake Erie in the area subsequently occupied by and adjacent to the SFA. The extent of dredge spoils beneath the Area 1 SWMUs has not been fully determined although records from the USACE indicate that the spoils are under the western edge of Area 1, beneath the fill unit and adjacent to SWMUs S-1, S-2, and S-27. There are no wells surrounding these SWMUs that are screened within the dredge spoil unit. Review of groundwater data for Area 1 (SWMUs S-1, S-2, S-5, S-6 and S-27) indicates some groundwater impacts are present downgradient of these SWMUs. Because of the presence of the VOCs in the upgradient wells, the contribution of these specific SWMUs to groundwater contamination cannot be fully determined.

In Area 2, six VOCs, sixteen SVOCs, and eighteen metals were detected. The soil analytical data suggests that the material in S-7/S-20 have a potential to leach.

The compounds detected in the SPLP analysis from Area 2 represent the compounds of most concern. These analytes were compared to the 1999/2000 groundwater sampling results for both upgradient and downgradient wells. In the upgradient well, only one VOC, benzene, was detected. Benzene was not detected in the SPLP analysis but was detected in the downgradient wells at a higher concentration. Four VOCs were detected in the SPLP analysis, three of which were detected at higher concentrations in the SPLP analysis than in the downgradient wells. No SVOCs were detected in the upgradient wells. The majority of the SVOCs were detected at higher concentrations in the downgradient wells than in the SPLP analysis. As mentioned previously, metals concentrations in the SPLP analysis and groundwater are inconclusive due to the presence of the slag. Additionally, the extent of dredge spoils beneath the Area 2 SWMU has not been fully determined although USACE records indicate that the spoils are under the western edge of Area 2, beneath the fill unit and adjacent to SWMU S-3.

In Area 3, six VOCs, eighteen SVOCs and twelve metals were detected. The SPLP soil analytical data suggests that the material in S-4 have a potential to leach.

The compounds detected in the SPLP analysis from Area 3 represent the compounds of most concern. These analytes were compared to the 1999/2000 groundwater sampling results for both upgradient and downgradient wells. Of the VOCs detected in the SPLP analysis, upgradient wells and downgradient wells, three out of four VOCs were detected at higher concentrations in the SPLP analysis than in either the upgradient or downgradient wells. One VOC was detected in the downgradient well that was not detected in either the SPLP or upgradient well analysis. Additionally, one VOC was detected in the upgradient well that was not detected in either the SPLP or downgradient well. Of the SVOCs detected, only two SVOCs were detected in the SPLP analysis at lower concentrations than either the upgradient or downgradient wells. As mentioned previously metals concentrations are varied and likely the result of the slag fill.

The 1999 groundwater sampling in Area 3 has shown that in general, the number of detected analytes in the upgradient and downgradient were similar, although the concentrations were slightly higher in the downgradient wells, with the most notable increases in ethylbenzene, toluene, and xylenes. The extent of dredge spoils beneath the Area 3 SWMUs has not been fully determined although USACE records indicate that the spoils are under the western edge of Area 3, beneath the fill unit and adjacent to SWMU S-4. Downgradient well MWS-01B is screened within the sand unit that may correspond with the dredge spoil unit. Upgradient wells MWS-14 and MWS-14B are east of SWMU S-8, which is upgradient of SWMU S-4. SWMU S-8 is not included in the Zone 2 SFA. Although this review of groundwater data indicates groundwater impacts are present downgradient of SWMU S-4, because of the potential impacts to groundwater due to the US Army Corps dredge spoils disposal, and upgradient sources of contamination, the contribution of SWMU S-4 to groundwater contamination cannot be fully determined.

3.0 RISK ASSESSMENT

A human health risk assessment, as described in the *Human Health Risk Assessment Work Plan* (BSC 1997a), was conducted for SWMU Group SFA-1, the Zone 2 Slag Fill Area. The results of the Tier 1 Human Health Risk Assessment (HHRA) are presented here and are organized into the following sections: Data Evaluation, Exposure Assessment, Toxicity Assessment, Risk Characterization, and Uncertainty Analysis. The major components of this HHRA have previously been presented in the Human Health Risk Assessment Report, Part IV of this RFI Report. Therefore, the following sections provide summary overviews of previously presented information. This section, therefore, serves as a summary report, bringing together all associated and related work from previous risk assessment deliverables, and providing the conclusions of the SWMU-specific risk assessment.

3.1 Data Evaluation

SWMUs S-1, S-2, S-4, S-5, S-6, S-7, S-20 and S-27 are included in SWMU Group SFA-1. Placing SWMUs into groups at the BSC Lackawanna site was done in accordance with ID No. 1, with the main purpose being to increase the size of analytical data sets for SWMUs with similar operations, types of constituents, and proximity of the SWMUs to neighboring units. Therefore, this risk assessment uses SWMU material data collected from the seven SWMUs listed above; herein, these seven SWMUs will be discussed in terms of their placement into SWMU Group SFA-1. The associated uncertainties of grouping these seven SWMUs are presented in the Uncertainty Analysis section of this report.

A list of 96 constituents of potential interest (COPIs) was developed for the BSC Lackawanna, New York site based on USEPA and industry studies (BSC 1998). The list contains hazardous constituents that could be present in the waste streams as a result of integrated iron and steel plant operations, such as those historically conducted at the Lackawanna site. Human Health Risk Assessment ID No. 1 (BSC 1998) established the chemicals of potential concern (COPCs) for each SWMU at the Lackawanna Site. The COPCs were determined by sequentially applying the following criteria, as applicable, to each COPI on a medium-by-medium basis for each SWMU and watercourse: 1) the chemical was detected in at least 5% of the samples, 2) the chemical was detected in at least one sample at levels above background (*i.e.*, the maximum concentration was above background; for chemicals in surficial SWMU material only), and 3) the chemical was positively detected in at least one sample at levels above applicable screening criteria [*i.e.*, USEPA Region III Risk Based Concentrations (RBCs), USEPA Soil Screening Levels (SSLs), or NYSDEC Ambient Water Quality Standards and Guidance values]. In accordance with ID No. 1, a background comparison was not made for the subsurface SWMU material.

The sampling data for SWMU Group SFA-1 (as presented in Section 2.0 of this report) were evaluated in order to identify the site-related COPCs for the SWMU. The COPCs were originally determined in ID No. 1, however, as some screening criteria were revised since ID No. 1 was submitted, this screening process has been updated (Tables 5 through 7). Table 5 presents the screening of the surficial SWMU material, Table 6 presents the screening of the subsurface SWMU material, and Table 7 presents the screening of groundwater.

Seven semivolatile organic and five inorganic COPCs were identified in surface SWMU material; no volatile COPCs were identified. One volatile organic COPC, three volatile semivolatile organic COPCs, four semivolatile organic COPCs and three inorganic COPCs were identified in subsurface SWMU material. Nine volatile organic COPCs and four volatile semivolatile COPCs were identified in groundwater.

Representative concentrations were determined for each COPC. If the sample size for a dataset was greater than ten, the 95% upper confidence limit of the mean was used. For those datasets with sample sizes of less than ten, the maximum concentration was used. Between three and eleven samples were collected of the surficial material in SWMU Group SFA-1, therefore both the 95% UCL and maximum concentrations were used accordingly. Between ten and sixteen samples were collected in subsurface SWMU material, therefore, the 95% UCL was calculated. The SWMU Group SFA-1 is located in the Zone 2 groundwater area (BSC 1998). There are at least 10 samples for all of the COPCs in Zone 2 groundwater, therefore, the 95% UCL was used as the representative concentration. The COPCs and their representative concentrations are presented in Table 8.

If a chemical's representative concentration exceeds its saturation limit in soil, or its solubility limit in groundwater, this is noted in Table 8. Exceedances of either of these levels could indicate the presence of free product.

3.2 Exposure Assessment

The exposure assessment conducted for SWMU Group SFA-1 included a review of current and future human receptor scenarios and potential exposure pathways, as related to the COPCs. In general, exposure pathways by which a human receptor could come into contact with SWMU material are defined by four components (USEPA 1989):

- A source and mechanism of constituent release to the environment;
- An environmental transport mechanism;
- A point of potential human contact with the affected medium, and
- A route of entry into humans.

If any one of these components is missing, the pathway is considered incomplete and does not contribute to receptor exposure.

Human Health Risk Assessment ID No. 2 (BSC 1999a) presented the current and future human receptor scenarios and potentially complete exposure pathways for each of the SWMUs identified at the Lackawanna Site. Interim deliverable No. 1 (BSC 1998) identifies the COPCs; these COPCs were also integral in determining complete exposure pathways, based on their presence in each medium (i.e., surface SWMU material, subsurface SWMU material or groundwater) and their volatility (e.g., inorganics in groundwater do not present a complete exposure pathway as they are not volatile and groundwater is not used as a drinking water source).

Potential exposure pathways for SWMU Group SFA-1 are presented in Table 9. For SWMU Group SFA-1, the potential receptor scenarios include a current non-BSC commercial/industrial worker scenario, a future commercial/industrial worker scenario, a future construction worker scenario, a future utility/maintenance worker scenario, a trespasser scenario, a future marina worker scenario, a future greenway user scenario, a future fenceline resident scenario, and a present fenceline resident scenario. For the future commercial/industrial workers scenario, the future utility/maintenance worker scenario, the future construction worker scenario and the trespasser scenarios, the following pathways were determined to be complete: direct contact (*i.e.*, ingestion and dermal contact) with surface SWMU material, inhalation of airborne particulates from surface SWMU material, inhalation of vapors from subsurface SWMU material and inhalation of vapors from Zone 2 groundwater. The future commercial/industrial worker scenario may also be potentially exposed to indoor vapors from groundwater or subsurface SWMU material, should a building be placed on the site. The future construction worker and future utility/maintenance worker scenarios may additionally be exposed via direct contact with subsurface SWMU material during potential future digging activities. For the current non-BSC commercial/industrial worker scenario, future marina worker scenario, future greenway user scenario, and present and future residents scenarios, inhalation of particulates in surficial SWMU material and inhalation of vapors in subsurface SWMU material are the only potentially complete exposure pathways evaluated in this SWMU-specific risk assessment. It is relevant to note that the current and future residential scenario, and the future marina worker scenario represent potential exposure scenarios, which are located off site.

A detailed description of the potentially exposed receptor scenarios and pathways for SWMU Group SFA-1 can be found in ID No. 2 (BSC 1999a).

3.3 Toxicity Assessment

A toxicity assessment characterizes the relationship between the exposure to a COPC and the frequency of adverse health effects that may result from such an exposure (dose-response). The end result of the dose-response assessment is the determination of human uptake levels that provide an adequate measure of protection to exposed persons for carcinogenic and noncarcinogenic endpoints. The derivation of acceptable levels of exposure (*e.g.*, risk-based screening levels (RBSLs) and the manner in which these levels are used in this HHRA are discussed below.

A number of items are noted in reference to the RBSL calculations. First, the future commercial/industrial worker scenario RBSL for direct contact with arsenic (0.94 mg/kg) is below the arsenic background level established the site (12 mg/kg). As the background level was deemed an appropriate screening value in a previous step of the HHRA, it was used as the default RBSL for screening in lieu of the future commercial/industrial worker scenario RBSL.

It should also be noted that, in groundwater, many of the RBSLs calculated were greater than the chemical's solubility in water. This indicates that, based on the predicted amount of chemical volatilization, pure product in the groundwater would not pose an inhalation health threat from these chemicals. The solubility limits of these chemicals are indicated in Table 11.

Some of the RBSLs calculated for the COPCs in subsurface SWMU material may have been determined to be health protective at concentrations, which are greater than the chemical's saturation limit in soils. It is important to consider that chemical emissions from soil to air reach a plateau at the chemical's saturation limit, and volatile emissions will not increase above this level, regardless of how much more chemical is added to the soil. In other words, the exposure concentration for an inhalation-only scenario cannot exceed a chemical's saturation limit. Furthermore, RBSLs that are above the saturation limit are not likely to pose increased risks or hazards via an inhalation exposure route (USEPA 1996). Therefore, RBSLs that are based only upon the inhalation pathway are capped at the saturation limit for that chemical, and "> saturation limit" is indicated in such situations (Table 11). RBSLs that are not based solely on inhalation were not capped at the saturation limit, as the potential exposure concentrations are greater than the saturation limit for direct contact scenarios (e.g., dermal contact, ingestion).

Some of the RBSLs for COPCs in SWMU material were determined to be health protective at levels which are greater than 1,000,000 parts per million (mg/kg); such cases are noted by the following indicator ">1,000,000" in Table 11. For those RBSLs that were based on inhalation, if a calculated RBSL is greater than both the saturation limit in soil and 1,000,000 mg/kg, ">1,000,000" is shown in Table 11 as it is more indicative of the level of health-protectiveness.

Tier 1 RBSLs were calculated and compared to the representative SWMU Group SFA-1 COPC concentrations. RBSLs are defined as concentrations of COPCs in media that are not expected to produce any adverse health effects under assumed exposure conditions. Tier 1 RBSLs were developed using information previously defined and described in detail in Part IV of the RFI Report and ID No. 2. The equations used to calculate the RBSLs follow basic USEPA risk assessment principles (USEPA 1989; 1996). Conservative exposure parameters, as defined by the ASTM Standard (ASTM 1995) and USEPA guidance (USEPA 1989, 1991a, and 1991b), and USEPA toxicity criteria (USEPA 2000a); were inputs into these equations to develop the RBSLs. As some of the toxicity criteria were revised by the USEPA since originally presented in ID No. 1, they are presented in Table 10 of this HHRA. The above information was used to calculate Tier 1 RBSLs for COPCs in SWMU material and groundwater, for each of the nine receptor exposure scenarios.

For this risk assessment, vapor dispersion modeling was performed to enable estimation of potential exposure to airborne COPCs emanating from subsurface SWMU material. The equations and parameters used were previously discussed and presented in ID. No 2. Modeling was performed with the USEPA Industrial Source Complex Short-Term Model (ISCST3, version 99155) and with meteorological data collected at a monitoring station at the Lackawanna Site in 1991. For current non-BSC workers scenarios, Tier 1 RBSLs were calculated based on the maximum estimated impacts in the northern, middle, and southern regions of the Site. For this Tier 1 assessment, the most conservative RBSL (*i.e.*, lowest) of the regions was used to represent the current non-BSC worker scenario. Particle dispersion modeling was not performed for Tier 1 RBSLs; instead, it was conservatively assumed that the receptor is actually present on the SWMU.

A comparison of the representative COPC concentrations to RBSLs for each of the exposure scenarios is presented in Table 11. This comparison provides a preliminary screening of potential risk to the specific receptor populations and exposure pathways identified for this SWMU.

For the future commercial/industrial worker scenario, concentrations of antimony, arsenic, lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene and indeno(1,2,3-c,d)pyrene in surface SWMU material exceed direct contact RBSLs. As discussed, the arsenic RBSL (0.94 mg/kg) defaults to the background concentration (12 mg/kg). The representative concentrations of benzene and naphthalene exceed the respective RBSLs for subsurface SWMU material for both ambient and indoor inhalation scenarios.

For the future construction worker scenario, concentrations of antimony, lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-c,d)pyrene in surface SWMU material exceed direct contact RBSLs. The representative concentrations of arsenic and naphthalene exceed direct contact for subsurface SWMU material.

For the future utility maintenance worker scenario, concentrations of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-c,d)pyrene in surface SWMU material exceed direct contact RBSLs. The representative concentration of naphthalene exceeds the RBSL for direct contact with subsurface SWMU material.

The trespasser scenario RBSLs are exceeded for direct contact with lead, benzo(a)anthracene, benzo(a)pyrene and benzo(b)fluoranthene in surficial SWMU material. For all other scenarios, chemicals and pathways, the representative concentrations are below RBSLs.

In accordance with Part IV of the RFI Report, those COPCs that do not exceed the Tier 1 RBSLs are not evaluated further. For those COPCs that exceed Tier 1 RBSLs, the risk to human health is evaluated further using a Tier 1 HHRA.

3.4 Risk Characterization

Risk characterization involves estimating the magnitude of potential adverse health effects of the COPCs, and summarizing the nature of the health impact to the defined receptor populations. It combines the results of the toxicity and exposure assessments to provide numerical estimates of health risk.

In accordance with Part IV of the RFI Report, those COPCs that exceed an RBSL were further evaluated in a Tier 1 HHRA. A Tier 1 HHRA provides an estimate of risk and hazard based on a comparison of the RBSL (*i.e.*, health-protective levels) to the COPC concentrations (*i.e.*, site-specific levels). Specifically, for those COPCs, that exceeded an RBSL, a screening-level hazard index (SLHI) was calculated to evaluate noncarcinogenic health effects, and a total screening-level cancer risk ($SLCR_{total}$) was calculated to evaluate carcinogenic effects. The SLHI and $SLCR_{total}$ methodologies are presented in the Work Plan (BSC 1997a). The Tier 1 HHRA results are summarized in Table 12.

3.4.1 Noncarcinogenic Hazards

The noncancer hazards were assessed in this HHRA using a hazard quotient approach (USEPA 1989). For each COPC, the noncarcinogenic RBSL was compared to the COPC's representative concentration to determine the screening level hazard quotient (SLHQ) for that chemical. The equation is as follows:

$$\text{SLHQ} = \frac{\text{Representative concentration}_{\text{COPC/medium}}}{\text{RBSL}_{\text{COPC/medium/receptor/pathway}}}$$

The SLHQs for each chemical are summed to create a total Screening Level Hazard Index ($SLHI_{total}$) for each pathway. The smaller the SLHQ/SLHI, the greater the degree of protection for that pathway. In accordance with USEPA methodology (USEPA 1989) and as discussed in the Work Plan, if the SLHI is less than 1, the hazards are considered to be negligible. Those $SLHI_{total}$s that exceed 1 were further evaluated by developing target organ-specific SLHIs. This process is appropriate as only certain chemicals affect similar biological target endpoints, and thus, it is only relevant to quantify the additive effects of these chemicals.

The calculated SLHQs and SLHIs are summarized in Table 12. Total SLHI values are greater than 1 for each receptor population evaluated (i.e., future commercial/industrial worker, future construction worker, future utility/maintenance worker, and trespasser).

The future commercial/industrial worker scenario was evaluated for exposure to both indoor and ambient air. As a worker will not be exposed to both ambient and indoor air simultaneously during the day, the ambient and indoor air SLCRs were evaluated separately. The $SLHI_{total}$ for future commercial/industrial worker scenario exposed to ambient air is 8, and the $SLHI_{total}$ for the indoor future commercial/industrial worker scenario is 22. These SLHIs were also evaluated for exposure pathway-specific scenarios for the future commercial/industrial worker scenario. The SLHI for inhalation of ambient vapors from subsurface SWMU material is 2.9 (attributable to benzene and naphthalene); for inhalation of indoor vapors, the SLHI is 17 (due to benzene and naphthalene). The SLHI for direct contact with surficial SWMU material is 4.9 (antimony is the sole contributor).

For the future commercial/industrial worker scenario exposed to ambient air, the blood/immune system SLHI is 6.7 (benzene in subsurface SWMU material and antimony in surficial SWMU material) and the upper respiratory system SLHI is 1.2 (naphthalene in subsurface SWMU material). For the indoor worker scenario, the blood/immune system SLHI is 19 (benzene in subsurface SWMU material and antimony in surficial SWMU material) and the upper respiratory system SLHI is 4 (naphthalene in subsurface SWMU material).

The $SLHI_{total}$ for the future construction worker scenario is 15. These SLHIs were also evaluated for exposure pathway-specific scenarios. The SLHI for direct contact with surficial SWMU material is 1.9 (antimony is the sole contributor). The SLHI for direct contact with subsurface SWMU material is 13 (attributable solely to naphthalene). Target organ SLHIs for the future construction worker scenario are as follows: the blood/immune system SLHI is 1.9, due to antimony in surficial SWMU material, and the total upper respiratory system SLHI is 13, due to naphthalene in subsurface SWMU material.

The future utility/maintenance worker scenario $SLHI_{total}$ is 2.6 attributable to direct contact with naphthalene in subsurface SWMU material. The only target organ SLHI for the utility/maintenance worker scenario is the upper respiratory system SLHI, which is identical to the $SLHI_{total}$ of 2.6.

Lead exceeds the direct contact RBSLs for surficial material for the future commercial/industrial worker scenario, the future construction worker scenario, future utility/maintenance worker scenario, and the trespasser scenario, as noted in Table 12. However, lead is not evaluated as part of the SLHI methodology due to its unique toxicological properties (BSC 1998, 1999; USEPA 1996c).

3.4.2 Carcinogenic Risk

In a human health risk assessment, carcinogenic health risks are defined in terms of the probability of an individual developing cancer over a lifetime as the result of exposure to a given chemical at a given concentration (USEPA 1989). The incremental probability of developing cancer over a lifetime (*i.e.*, the theoretical excess lifetime cancer risk) is the additional risk above and beyond the cancer risk an individual would face in the absence of the exposures characterized in this risk assessment. In this Tier 1 HHRA, cancer risk was evaluated according to the following equation:

$$\text{SLCR} = \frac{\text{Representative concentration}_{\text{COPC/medium}}}{\text{RBSL}_{\text{COPC/medium/receptor/pathway}}} \; x \; \text{Target Risk Level}$$

Cancer risks are summed regardless of the differences in target organ, weight-of-evidence for human carcinogenicity, or potential chemical interactions (*e.g.*, antagonistic or synergistic effects). This approach is consistent with USEPA's current approach to carcinogenic effects, which is to assume effects are additive unless adequate information to the contrary is available (USEPA 1989). Based on USEPA methodology (USEPA 1989) and as discussed in the Work Plan, if the total screening level cancer risk ($\text{SLCR}_{\text{total}}$) for each receptor/pathway combination is less than 1×10^{-4}, the risks are considered to be negligible.

The SLCRs for the future commercial/industrial worker scenario exposed to indoor or ambient air and the future construction worker scenario are above the acceptable risk of 1×10^{-4}. The SLCR for the utility/maintenance worker (4×10^{-5}) and the trespasser (1×10^{-5}) are both lower than the carcinogenic benchmark.

As mentioned earlier, because the future commercial/industrial worker cannot be exposed to both ambient and indoor air simultaneously during the day, a $SLCR_{total}$ for each scenario was developed. For the future commercial/industrial worker scenario, both the ambient $SLCR_{total}$ and the indoor $SLCR_{total}$ are 3×10^{-3}. These $SLCR_{total}$s were further evaluated by media type. The SLCR for direct contact with surficial SWMU material is 3×10^{-3} and is attributable to arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene and indeno(1,2,3-c,d)pyrene. The SLCR for inhalation of ambient vapors from subsurface SWMU material is 7×10^{-6}, and for inhalation of indoor vapors from subsurface SWMU material, the SLCR is 6×10^{-5}. For both the ambient and indoor inhalation worker scenarios, benzene comprises the entire risk.

For the future construction worker scenario, the ambient $SLCR_{total}$ is 2×10^{-4}. The SLCR for direct contact with surficial SWMU material is 1×10^{-4}: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-c,d)pyrene. The SLCR for direct contact with subsurface SWMU material is 2×10^{-6} (arsenic).

3.5 Conclusions

The results of the Tier 1 HHRA are that levels of antimony, arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene and indeno(1,2,3-c,d)pyrene in surficial SWMU material, and benzene and naphthalene in subsurface SWMU material exceed carcinogenic and/or noncarcinogenic RBSLs, producing either a hazard index greater than the Tier 1 noncarcinogenic benchmark of 1.0, or a carcinogenic risk greater than the carcinogenic benchmark of 1×10^{-4}.

Specifically, for the future commercial/industrial worker scenario, the calculated risk level generated by arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene and indeno(1,2,3-c,d)pyrene concentrations in surface SWMU material, and benzene in subsurface SWMU material is greater than the carcinogenic Tier 1 benchmark. Also, the calculated hazard index generated by antimony in surface SWMU material and benzene and naphthalene in subsurface SWMU material is greater than the Tier 1 noncarcinogenic benchmark.

For the future construction worker scenario, the calculated risk levels generated by benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-c,d)pyrene concentrations in surface SWMU material, and arsenic in subsurface SWMU material are greater than the carcinogenic Tier 1 benchmark. Also, the calculated hazard index for antimony in surface SWMU material and naphthalene in subsurface SWMU material is greater than the Tier 1 noncarcinogenic benchmark.

For the future utility/maintenance worker scenario, the calculated hazard index for naphthalene in subsurface SWMU material exceeds the Tier 1 noncarcinogenic benchmark.

The concentration of lead in surficial SWMU material is greater than the RBSLs for the future commercial/industrial worker, future construction worker, future utility/maintenance worker and trespasser scenarios.

Based on these results and in accordance with the work plan, further evaluation may be completed during the Corrective Measures Study (CMS) and could include a Tier II assessment or an evaluation of corrective measures. The uncertainties inherent in these conclusions are presented in the Uncertainty Analysis that follows. It should be noted that the grouping of SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20 and S-27 into SWMU Group SFA-1 might present the greatest uncertainty with this HHRA; this is discussed below.

3.6 Uncertainty Analysis

There are multiple sources of uncertainty that can be identified for any risk assessment. These include, among others, uncertainty associated with the toxicity criteria used to derive dose-response factors, uncertainties associated with exposure parameters used in the exposure assessment, and uncertainties associated with combining exposure parameters and toxicity criteria to characterize risk.

In the development of any health assessment, some level of uncertainty is introduced each time an assumption is relied upon to describe a dynamic parameter. Some assumptions have a significant scientific basis while others do not, which may result in the selection and use of conservative, default exposure parameters in the exposure assessment. The selection of multiple conservative assumptions in the exposure assessment generally results in an overestimation of potential health risks associated with exposure to specific chemical constituents. The primary areas of uncertainty for this risk assessment are qualitatively discussed below.

3.6.1 Exposure Scenarios

The evaluation of exposure scenarios that are not necessarily representative of realistic exposures based on current and future land use creates uncertainty in the overall risk potential of this SWMU group. The exposure scenarios evaluated in this risk assessment are not realistic in terms of foreseeable redevelopment for the Site. For instance, an evaluation of an indoor future industrial/commercial worker scenario was done even though the placement of a building on any of the SWMUs in this SWMU group site is not planned, nor is it feasible as these SWMUs are surface impoundments. Construction could not occur without removing the materials.

3.6.2 Site Sampling and Representative Concentrations

SWMU samples were selected in an attempt to identify the highest concentrations of chemicals at the site. Sample biasing was accomplished based on visual observations and photoionization detector readings. Thus, the sampling activities are thought to have characterized the most highly impacted areas of the SWMU, and not an average. This is conservative, as a potential receptor is not expected to remain on, or inhale particulates from, one portion of the SWMU for his or her entire exposure duration. Therefore, it is believed that the maximum concentrations used in this HHRA are likely to represent the true maximum site concentrations but not the average concentrations that are most representative of exposure.

It should also be noted that, for many of the COPCs in surface and subsurface SWMU material, the maximum concentration was used as the representative concentration in this HHRA. This was either because the calculated 95% UCL exceeds the maximum concentration, or there was an insufficient number of samples to calculate the 95% UCL. The representative concentrations were used to compare to the RBSLs calculated for this HHRA, and ultimately determine the chemicals of potential concern in this HHRA. Use of the maximum concentrations of the biased sampling is a very conservative methodology utilized in this HHRA.

3.6.3 COPC Selection Process

The COPCs evaluated for the SWMU Group were identified in the Human Health Risk Assessment Interim Deliverable (ID) No. 1 (BSC 1998). These chemicals were selected in part because of their representative concentrations exceeded Region III RBCs (USEPA 2000b) for residential scenarios. Since no residential exposures are realistic for any of the on-site scenarios, some chemicals have been retained as COPCs that are not likely to pose a potential threat to most of the human receptors, evaluated here.

3.6.4 Grouping of SWMUs S-1, S-2, S-4, S-5, S-6, S-20 and S-27

In accordance with ID No. 1, SWMUs S-1, S-2, S-4, S-5, S-6, S-20 and S-27 are included in SWMU Group SFA-1. As mentioned previously, this is due to their proximity to one another, their similarities in process waste, and amount of samples taken for each SWMU. The only technically supportable reason for grouping areas in a risk assessment is when the receptor would be expected to randomly come in contact with al the areas. Whether or not this would happen is not known. From the 1970s until the early to 1980s, SWMU Group SFA-1 was used as a means of managing materials produced by the water quality control stations (WQCSs) namely precipitated solids that settled out of treated waters. The SWMUs encompassed by SWMU Group SFA-1 were generally designed as surface impoundments. Although SWMUs S-1, S-2, S-4, S-5, S-6, S-20 and S-27 were grouped together for risk assessment purposes according to ID No. 1, there may be variations in the subsurface and surface materials between each individual SWMU as each surface impoundment received slightly different wastes (*e.g.* SWMU S-7 received wastes from WQCSs Nos. 3 and 7 whereas SWMU S-1 received wastes from WQCS Nos. 1, 2,4,5 and 6 plus waste oil from plant operations).

3.6.5 Exposure Parameters

Several conservative default exposure parameters (*e.g.*, inhalation rates, exposure frequency, exposure duration) were incorporated into the exposure assessment to define general population behavior. For example, for the industrial/commercial worker scenarios, default exposure parameters are intended to be conservative and representative of an individual who is consistently present at the site 24 hours a day, 250 days a year, in the area of highest concentration. It is more likely that the exposure of an industrial worker to a *particular SWMU* (i.e., SWMU material) on the Lackawanna site is limited to an average of only a few hours a day, 2 weeks year. Most parameters incorporated into the exposure assessment to define the receptor scenarios are conservative values used to define a worst-case population behavior. The net effect of using multiple conservative exposure assumptions is the overestimation of potential health risks.

Additionally, for a receptor population such as an industrial worker or a resident (*i.e.* where exposure duration is greater than 250 days/year), exposure frequency typically is corrected in site-specific health risk assessments for the fraction of the year when outdoor exposure to soil will be limited due to severe weather conditions such as snow, ice, rain and freezing temperatures (USEPA 1989). This factor is called a meteorological factor. Because of the geographical location of the Lackawanna site, a correction factor for weather conditions would be reasonable. In this Tier 1 human health risk assessment, exposure did not exclude days when the temperature is less than 32°F, when there is snow cover, or the ground was wet from other forms of precipitation. For this SWMU, the Tier 1 RBSLs were exceeded for the future commercial/industrial worker scenarios. Thus, applying a more realistic exposure frequency and a meteorological factor would result in higher RBSLs.

3.6.6 Toxicity Assessment

Noncarcinogenic Criteria- Toxicity information for many of the COPCs is limited for humans. Consequently, depending on the quality and extent of toxicity information, varying degrees of uncertainty will be associated with the calculated toxicity values. The USEPA derives reference concentrations (RfC; inhalation exposures) and reference doses (oral exposures) for chemicals using an uncertainty factor (UF) approach. The uncertainty factor for the naphthalene RfC, for instance, is 3000. This was derived by applying a UF of 10 to account for extrapolation of the mouse study to humans, another UF of 10 to account for sensitive humans, another UF of 10 to account for extrapolation from a LOAEL to a NOAEL, and a final UF of 3 to account for lack of an appropriate reproductive study. In general, the procedures used to extrapolate from animals to humans in toxicity studies include a conservative use of uncertainty factors so that potential effects on humans are likely overestimated rather than underestimated. It is widely accepted in the scientific community that low doses of toxicants may be detoxified by any one of several processes present in human organ systems (Ames *et al.* 1987). As a result, humans may not react to the same degree as the population of genetically homogeneous laboratory animal populations used in standard bioassays.

Carcinogenic Criteria- USEPA cancer SFs are developed using variations of the Linear Multistage Model (LMS) for carcinogenicity. The LMS is highly conservative as it assumes linearity between dose and effect to zero dose assuming no threshold for carcinogenicity. However, the human body has mechanisms to detoxify most chemicals particularly at low doses, and therefore many scientists believe that most, if not all carcinogens only cause cancer above a threshold dose.

The carcinogenic COPCs evaluated for this SWMU Group include benzene and arsenic. The inhalation slope factors for benzene and arsenic are based on human data from occupational exposure studies, and thus an extrapolation from animal data is not necessary, thereby reducing the some uncertainty in the slope factors. However, there is significant uncertainty associated with the low-dose extrapolation (environmental exposures are relevant in the low-dose range) used to generate the slope factors. The USEPA has used its default linear model to estimate risks in the low-dose range citing lack of carcinogenic mode of action information. Thus, should this information become available, the low-dose carcinogenic risks for benzene and arsenic may be evaluated differently.

Additionally, the derivation of the slope factor for benzo(a)pyrene has some uncertainty. The oral slope factor for benzo(a)pyrene (7.3 $(mg/kg\text{-}day)^{-1}$) is the geometric mean of four slope factors derived from two rodent feeding studies: Neal and Rigdon (1967), a mouse study and

Brune et al. (1981), a rat study. Three of the four values employ the data from the Neal and Rigdon (1967) study. The fourth cancer slope factor estimate was made using the linearized multistage model to calculate the upper 95% confidence interval on the slope in the low dose region using the data of Brune et al. (1981). The Neal and Rigdon (1967) study suffers from several study design flaws including dosing regimens and length of observation periods. Thus, in three of its four cancer slope factor estimates, USEPA mathematically manipulated data from a poor animal bioassay that did not conform to the standards of modern toxicology to derive the values. The mouse cancer slope factor was translated into a human cancer slope factor but there are no studies showing that ingestion of PAHs can cause cancer in humans. This slope factor is also used with adjustments for six other carcinogenic PAHs.

Absence of Inhalation Toxicity Criteria - Although toxicity information is generally available for the most significant chemicals and exposure routes in this HHRA, there were some volatile COPCs in this HHRA for which no inhalation toxicity criteria (RfDs or cancer slope factors) exist. In the absence of data, either the oral RfD or oral SF was used to evaluate inhalation exposures. The letter "R" on Table 10 notes these instances. This extrapolation assumes that the chemical is equitoxic by both routes. It is more conservative to evaluate these chemicals for inhalation exposures than to not evaluate them at all. Thus, this method potentially overestimates inhalation risks for COPCs evaluated as such. This uncertainty is not applicable to the inhalation RfCs or slope factors for the COPCs, which showed exceedances of their Tier 1 RBSLs (benzene, naphthalene, and arsenic) at this SWMU.

3.6.7 Risk Characterization

The development of an RBSL for lead, based on pharmacokinetic modeling (the USEPA Adult Lead Model) is inherently uncertain. These uncertainties relate to whether the model is capable of fully accounting for all significant variables that affect blood lead levels and whether selected input values, that cannot be measured, are accurate, especially for future, hypothetical populations. In addition, the use of this model for the trespasser is highly uncertain since it is not known whether an adolescent (who is not pregnant) is more sensitive to the effects of lead than the developing fetus of a pregnant adolescent.

Uncertainties in the risk characterization portion of the risk assessment for the site are a combination of the uncertainties associated with both the dose-response assessment and the exposure assessment. As discussed above, the assumptions and parameters used for both the dose response and exposure assessments are extremely conservative. In addition, since the toxicity criteria and exposure parameters are combined in the risk characterization, the conservatism is compounded.

3.6.8 Uncertainty Analysis Summary

This Tier 1 HHRA includes uncertainties and conservative assumptions that, in general, effectively combine to overestimate the potential current and future exposures. The major sources of uncertainty contributing to the conservatisms in this HHRA are summarized below:

- Evaluation indoor industrial/commercial worker scenario
- Biased SWMU sample collection
- Use of maximum concentrations as representative concentrations
- Grouping of SWMUs S-1, S-2, S-4, S-5, S-6, S-20 and S-27
- Compounding effect of multiple conservative exposure parameters
- No meteorological factor assumption
- Confidence in toxicity criteria

The net effect of the uncertainties of this HHRA is the generation of risk and hazard estimates that probably far exceed any true exposure conditions that currently exist or which could possibly exist in the future.

4.0 CONTAINMENT

Dames & Moore conducted site inspections in February 1995 and August 1995. The August 1995 inspection included representatives of USEPA Region II. Additional inspections were completed in September 1996 by Dames & Moore and in August 2000 and May 2001 by URS. Documentation of the 1996, 2000 and 2001 site visits are provided in Appendix A. The following is a description of the SWMUs based on site observations and information provided by BSC.

SWMUs S-1, S-2, S-4, S-5, and S-6 are open impoundments. Some vegetative cover exists on SWMU S-2. S-4 contains a dense grove of trees. S-1 and S-6 are open impoundments containing freestanding water and an oily film. All five SWMUs are contained within a bermed area, which prevents surface water run-off. There are no engineered liner systems beneath the SWMUs.

SWMU S-7/S-20 was constructed to manage wastewater treatment sludge. The sludge is contained within man-made dikes above the water table. The unit has been closed, on an interim basis, with a combination synthetic and blended concrete cap. The cap has been designed to prevent the infiltration of rainwater into the waste, thereby isolating the solid waste materials. With this control measure in place, the generation of leachate, the primary medium for transport of constituents from solid waste management units, is minimized. Thus, the waste materials are effectively contained in the unit. Precipitation collecting above the synthetic cap will either evaporate or, in the case of extreme precipitation events, flow through a drainage channel at the eastern end of the unit. A site inspection conducted in August 2000 verified the drainage channel and access road present on the east end of the unit.

SWMU S-27 was inspected in April 2001 by URS. The inspection revealed evidence of runoff from the surfaces of the mill scale piles. Incised drainage was not noted, nor was any containment observed to the south end.

5.0 CONCLUSIONS

Based on review of the data, the following conclusions can be made:

- Several of the SWMUs in SWMU Group SFA-1 were observed to have open liquids and oil on the surface of the impoundments.

- Based pre-RFI investigations, SWMU S-1 and S-5 contained analytes that meet TCLP criteria. RFI investigations found no samples that meet TCLP criteria.

- Total constituent analysis and SPLP analysis indicates the presence of several VOCs, SVOCs, metals, and cyanide in the SWMU material. Similar compounds are also noted in the groundwater samples collected from the wells surrounding the SWMUs. However, the contribution of these particular SWMUs to groundwater contamination is not known, as groundwater constituents have also been detected in upgradient wells.

- For the future commercial/industrial worker scenario, the calculated risk level generated by arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene and indeno(1,2,3-c,d)pyrene in surface SWMU material, and benzene in subsurface SWMU material is greater than the carcinogenic Tier 1 benchmark. Also, the calculated hazard index generated by antimony in surface SWMU material and benzene and naphthalene in subsurface SWMU material is greater than the Tier 1 noncarcinogenic benchmark of 1.0.

- For the future construction worker scenario, the calculated risk level generated by benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-c,d)pyrene in surface SWMU material, and arsenic in subsurface SWMU material is greater than the carcinogenic Tier 1 benchmark. Also, the calculated hazard index for antimony in surface SWMU material and naphthalene in subsurface SWMU material is greater than the Tier 1 noncarcinogenic benchmark.

- For the future utility/maintenance worker scenario, the calculated hazard index for naphthalene in subsurface SWMU material exceeds the Tier 1 noncarcinogenic benchmark.

- Levels of lead in surficial material exceed direct contact RBSLs for all populations evaluated.

Based on these results and in accordance with the work plan, further evaluation will be completed during the CMS studies, and may include a Tier II assessment or an additional evaluation of corrective measures.

REFERENCES

American Society for Testing and Materials (ASTM). 1995. *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites*. E 1739-95.

Ames, B.N., Magaw, R. and Gold, L.S. 1987. Ranking possible carcinogenic hazards. *Science.* 236:271-273.

Bethlehem Steel Corporation (BSC). 1987. *HWM-1 and HWM-2 Groundwater Quality Assessment Plan, Bethlehem Steel Corporation, Lackawanna, New York.* Lackawanna, New York. July

Bethlehem Steel Corporation (BSC). 1990a. *Phase I, Final Work Plan for Phased Site Investigation*. Lackawanna, New York. May.

Bethlehem Steel Corporation (BSC). 1990b. *Data Collection Quality Assurance Plan, Bethlehem Steel Corporation, Lackawanna, New York* . Lackawanna, New York. August.

Bethlehem Steel Corporation (BSC). 1991. *SWMU Assessment Reports - Ironmaking Blast Furnace Scrubber Water*. Lackawanna, NY. January.

Bethlehem Steel Corporation (BSC). 1992a. *Preliminary SWMU Assessment Report of Surface Impoundment B- SWMU S-2.* 15 August 1992.

Bethlehem Steel Corporation (BSC). 1992b. *Preliminary SWMU Assessment Report of Surface Impoundment D-SWMU S-4.* 15 August 1992.

Bethlehem Steel Corporation (BSC). 1992c. *Preliminary SWMU Assessment Report of Surface Impoundment F-SWMU S-6.* 15 August 1992.

Bethlehem Steel Corporation (BSC). 1992d. *Preliminary SWMU Assessment Report of Surface Impoundment G-SWMU S-7.* 29 October 1992.

Bethlehem Steel Corporation (BSC). 1992e. *Preliminary SWMU Assessment Report of Drying Area for Sludge from Impoundment F-SWMU S-20.* 29 October 1992.

Bethlehem Steel Corporation (BSC). 1992f. *Preliminary SWMU Assessment Report - Blast Furnace Scrubber Water Final Thickener (SWMU P-17)*. Lackawanna, NY. April.

Bethlehem Steel Corporation (BSC). 1992g. *Preliminary SWMU Assessment Report - Ironmaking Blast Furnace Scrubber Water Cooling Tower, Hot and Cold Wells (SWMU P-18) Water Quality Control Station No. 9.* Lackawanna, NY. July.

Bethlehem Steel Corporation (BSC). 1993a. *Preliminary SWMU Assessment Report, SWMU S-15, General Rubble Landfill O.* Lackawanna, NY. January 5.

REFERENCES (con't)

Bethlehem Steel Corporation (BSC). 1993b. *Work Plan, – Phased Site Investigation, Bethlehem Steel Corporation, Lackawanna, New York – Phase II,* "Phase IIB Work Plan". Lackawanna, NY. June 20.

Bethlehem Steel Corporation (BSC). 1994. *Work Plan, – Phase IIC, Phased Site Investigation.* Lackawanna, NY. December.

Bethlehem Steel Corporation (BSC). 1997a. *Human Health Risk Assessment Work Plan.* Lackawanna, NY. April.

Bethlehem Steel Corporation (BSC). 1997b. *Natural Attenuation, Phase 2 Study Work Plan* , Lackawanna, NY. 9 April.

Bethlehem Steel Corporation (BSC). 1998. *Human Health Risk Assessment for Bethlehem Steel Corporation's Lackawanna, New York Site. Revised Final Interim Deliverable Number 1: Detailed Process for Selection of Chemicals of Potential Concern and Identification of Toxicological Criteria.* Lackawanna, NY. May.

Bethlehem Steel Corporation (BSC). 1999a. *Human Health Risk Assessment for Bethlehem Steel Corporation's Lackawanna, New York Site. Interim Deliverable Number 2: Exposure Pathway Conceptual Site Model and Tier 1 Equations and Parameter Values.* Lackawanna, NY.

Bethlehem Steel Corporation (BSC). 1999b. Letter Report to the NYSDEC detailing the results of the sampling at SWMU S-1. Lackawanna, NY.

Bethlehem Steel Corporation (BSC). 1999c. *Work Plan, Comprehensive Well Sampling, Bethlehem Steel Corporation, Lackawanna, New York* . Lackawanna, NY. September

Bethlehem Steel Corporation (BSC). 2000. Letter to the NYSDEC containing Report of Analysis for samples collected at SWMU-1. Ana Marie Caram. Bethlehem, PA. June 13.

Brune, H., R.P. Deutsch-Wenzel, M. Habs, S. Ivankovic and D. Schmhl. 1981. Investigation of the tumorigenic response to benzo(a)pyrene in aqueous caffeine solution applied orally to Sprague-Dawley rats. J. Cancer Res. Clin. Oncol. 102(2):153-157.

Ecology and Environment, Inc. 1985. Bethlehem Steel Closure Plan for Surface Impoundments S1 and S5. October 10.

Federal Register. 1990. Toxicity Characteristics (TC) Final Rule (55 FR 11798). March 29.

Irons, S.D. 1988a. Letter report to R.B. Allen, Preliminary Results to Characterize Materials in Lackawanna Impoundments and Landfill Areas - Status Report No. 1. May 17.

REFERENCES (con't)

Irons, S.D. 1988b. Letter report to R.B. Allen, Characterization of Materials in Lackawanna Impoundments and Landfill Areas - Status Report No. 2. June 22.

Irons, S.D. 1989. Letter report to R.B. Allen, Characterization of Materials in Lackawanna Impoundments and Landfill Areas - Status Report No. 3. February 6.

Maxim Technologies. 2000. *SWMU S-1 Drilling and Sampling.* Bethlehem Steel Corporation, Lackawanna, NY. June 27.

Neal, J. and R.H. Rigdon. 1967. Gastric tumors in mice fed benzo[a]pyrene: a quantitative study. Tex. Rep. Biol. Med. 25:553.

New York State Department of Environmental Conservation (NYSDEC). 1998. *Ambient Water Quality Standards and Guidance Values.*

Ogden Environmental and Energy Services Co. Inc. (Ogden) 2000. *Revised Supplemental Ecological Sampling and Methods Clarification Plan.* Somerset, New Jersey. December.

U.S. Environmental Protection Agency, National Enforcement Investigations Center (USEPA NEIC). 1988. RCRA Facility Assessment, Bethlehem Steel Corporation, Lackawanna Plant. EPA-330/2-88-054. September.

U.S. Environmental Protection Agency (USEPA). 1989. *Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part A)*, interim final. Office of Emergency and Remedial Response, Washington, D.C. EPA/540/1-89/002.

U.S. Environmental Protection Agency (USEPA). 1990a. Report to Congress on Special Wastes from Mineral Processing. July.

U.S. Environmental Protection Agency (USEPA). 1990b. "Administrative Order on Consent, Docket No. II RCRA-90-3008(h)-0201, Bethlehem Steel Corporation, Lackawanna, New York". Washington, D.C. 13 August.

U.S. Environmental Protection Agency (USEPA). 1991a. *Risk Assessment Guidance for Superfund, Volume 1. Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals)*, interim. Office of Emergency and Remedial Response, Washington, D.C. PB92-963333.

U.S. Environmental Protection Agency (USEPA). 1991b. *Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors."* Directive 9285.6-03. Interim Final. Office of Emergency and Remedial Response, Toxics Integration Branch, Washington, D.C.

REFERENCES (con't)

United States Environmental Protection Agency (USEPA). 1994. *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities.* OSWER Directive No. 9355.4-12. Office of Emergency and Remedial Response, Washington, DC EPA/540F-94/043, PB94-983282.

U.S. Environmental Protection Agency (USEPA). 1996a. *Soil Screening Guidance: Technical Background Document.* Office of Solid Waste and Emergency Response. Office of Emergency and Remedial Response; Hazardous Site Control Division. EPA/540/R-95/128. May.

U.S. Environmental Protection Agency (USEPA). 1996b. *Soil Screening Guidance: Users Guide.* Office of Solid Waste and Emergency Response. Office of Emergency and Remedial Response; Hazardous Site Control Division. EPA/540/R-96/018. July.

United States Environmental Protection Agency (USEPA). 1996c *Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil.* Technical Review Workgroup for Lead. Office of Emergency and Remedial Response. December.

United States Environmental Protection Agency (USEPA). 1997. *Health Effects Assessment Summary Tables (HEAST).* USEPA, Environmental Criteria and Assessment, Office of Research and Development. Cincinnati, Ohio. EPA 540/R-97-036. July

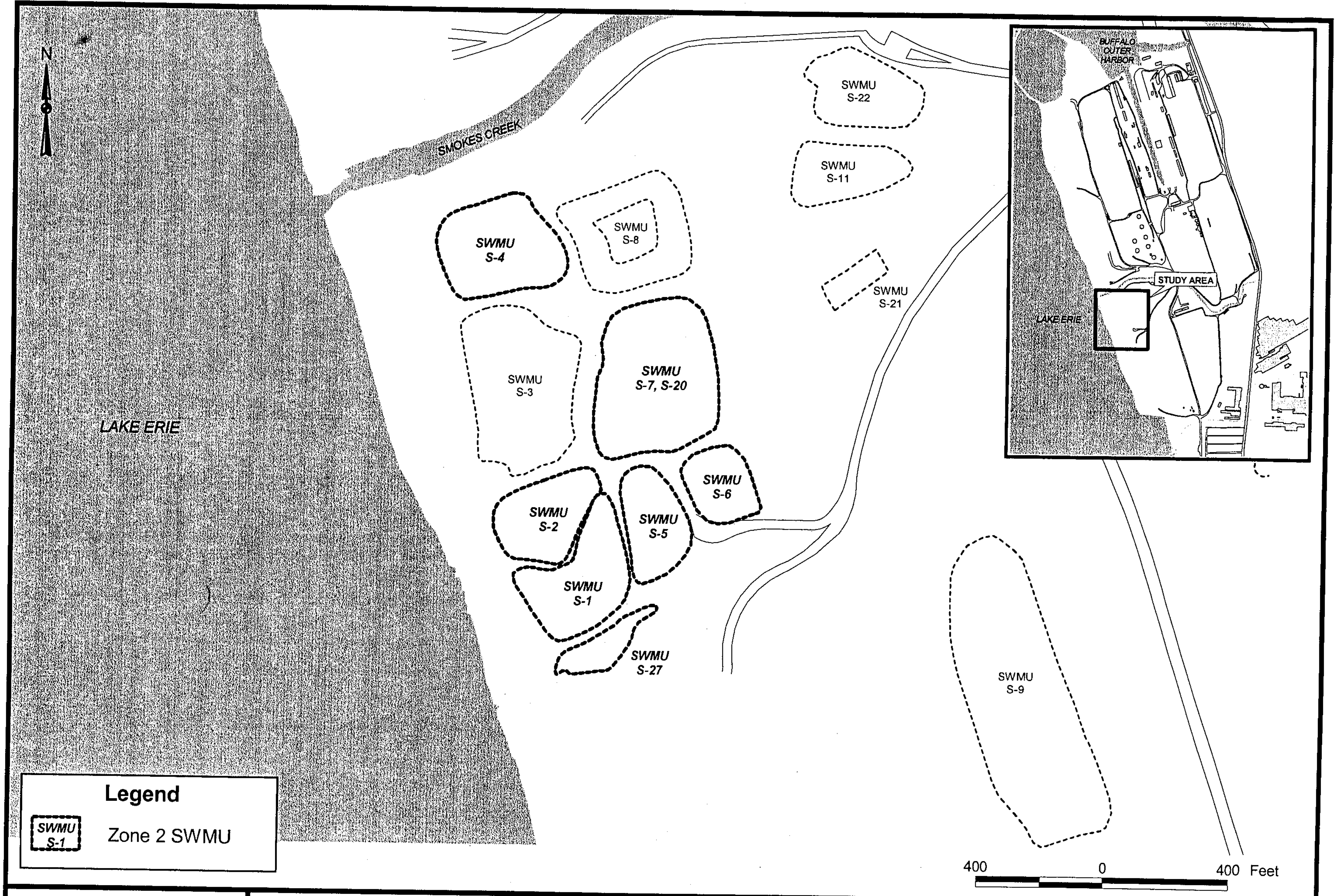
U.S. Environmental Protection Agency (USEPA). 2000a. *Integrated Risk Information System* (IRIS). Cincinnati, OH.

U.S. Environmental Protection Agency (USEPA). 2000b. Risk-Based Concentration Table, Region III. October.

Weidner, T.H. 1997. Letter report to N.B. Franco, Excavation and Screening Tests on Lackawanna S-5 Impoundment Sludge. August 8.

Weidner, T.H. 1999. Letter report to N.B. Franco, Drill Core Sampling of Lackawanna Solid Waste Management Units S2, S3, & S6 Conducted in October 1998. February 5.

J:\4200008bsc.15\gis\PRESENT\swmu_report\zone2swmu.apr ZONE 2 STUDY LOCATIONS
10/10/2001



URS

BETHLEHEM STEEL CORPORATION
SITE LOCATION MAP

FIGURE 1

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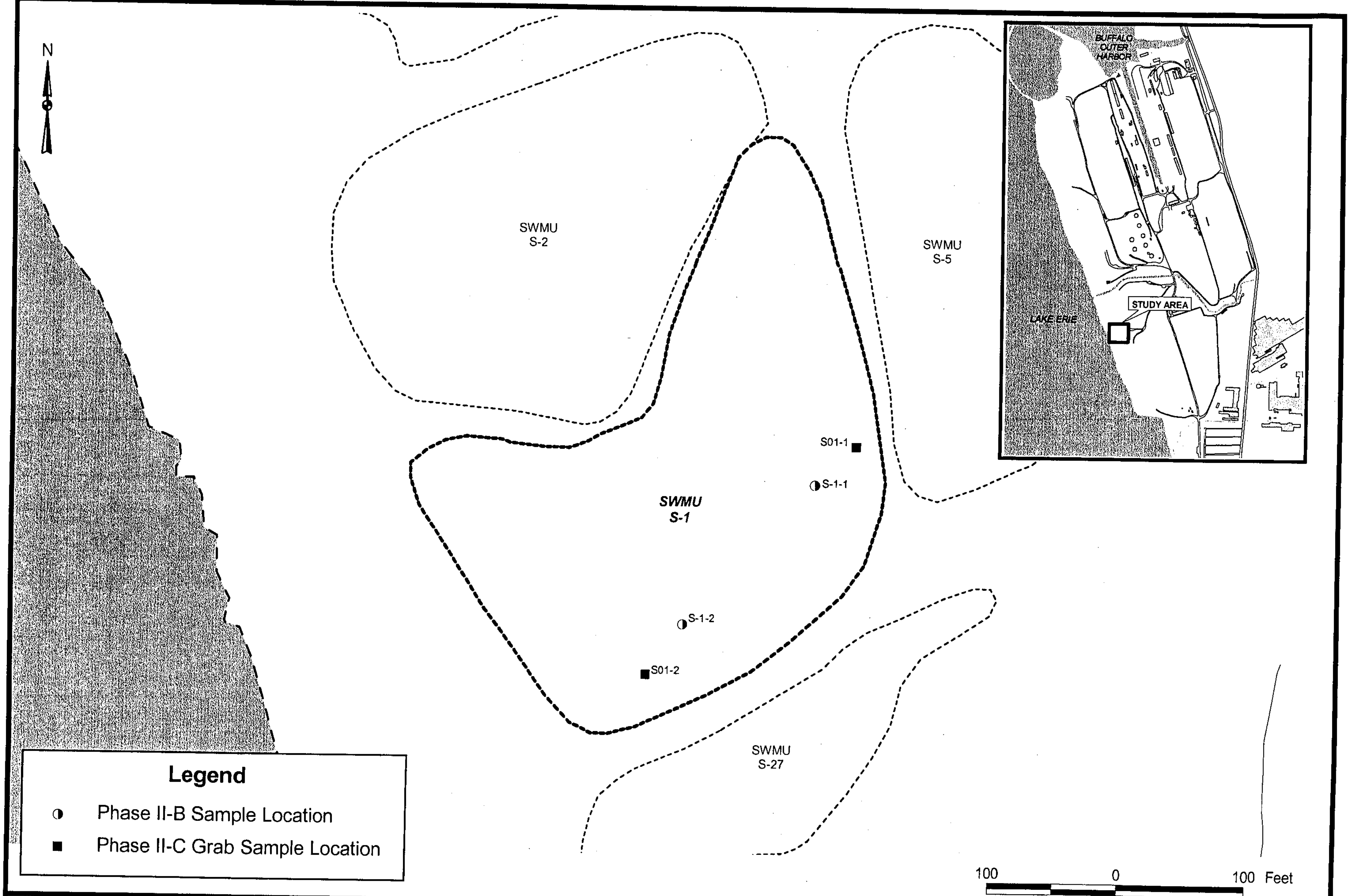
10/10/2001

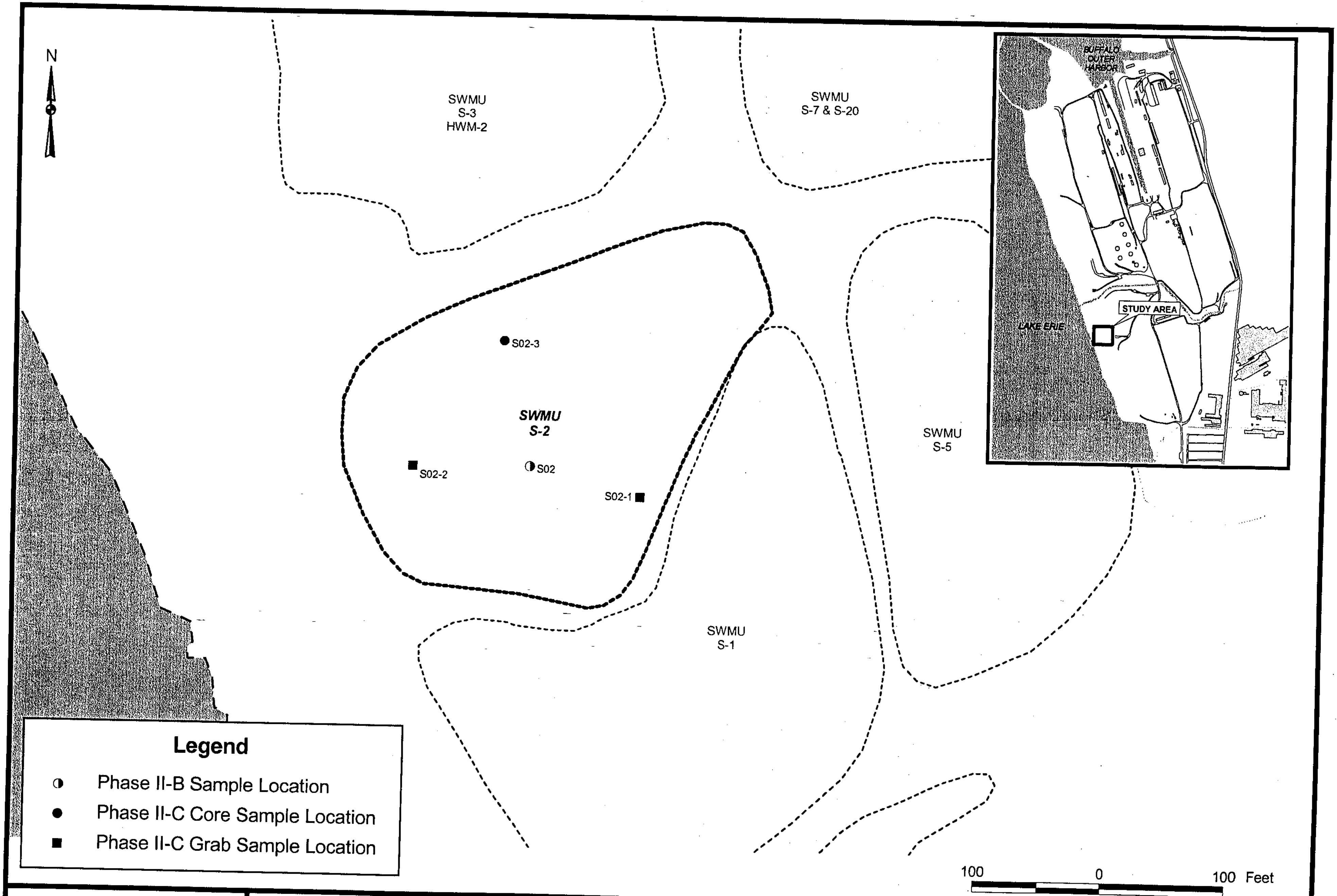


URS

BETHLEHEM STEEL CORPORATION
SITE LOCATION FOR SURFACE IMPOUNDMENT A (SWMU S-1)
SOIL SAMPLE LOCATIONS

FIGURE 2

J:\4200008bsc.15\gis\PRESENT\swmu_report\zone2swmu.apr SWMU S-2 SAMPLING LOCATIONS
10/10/2001

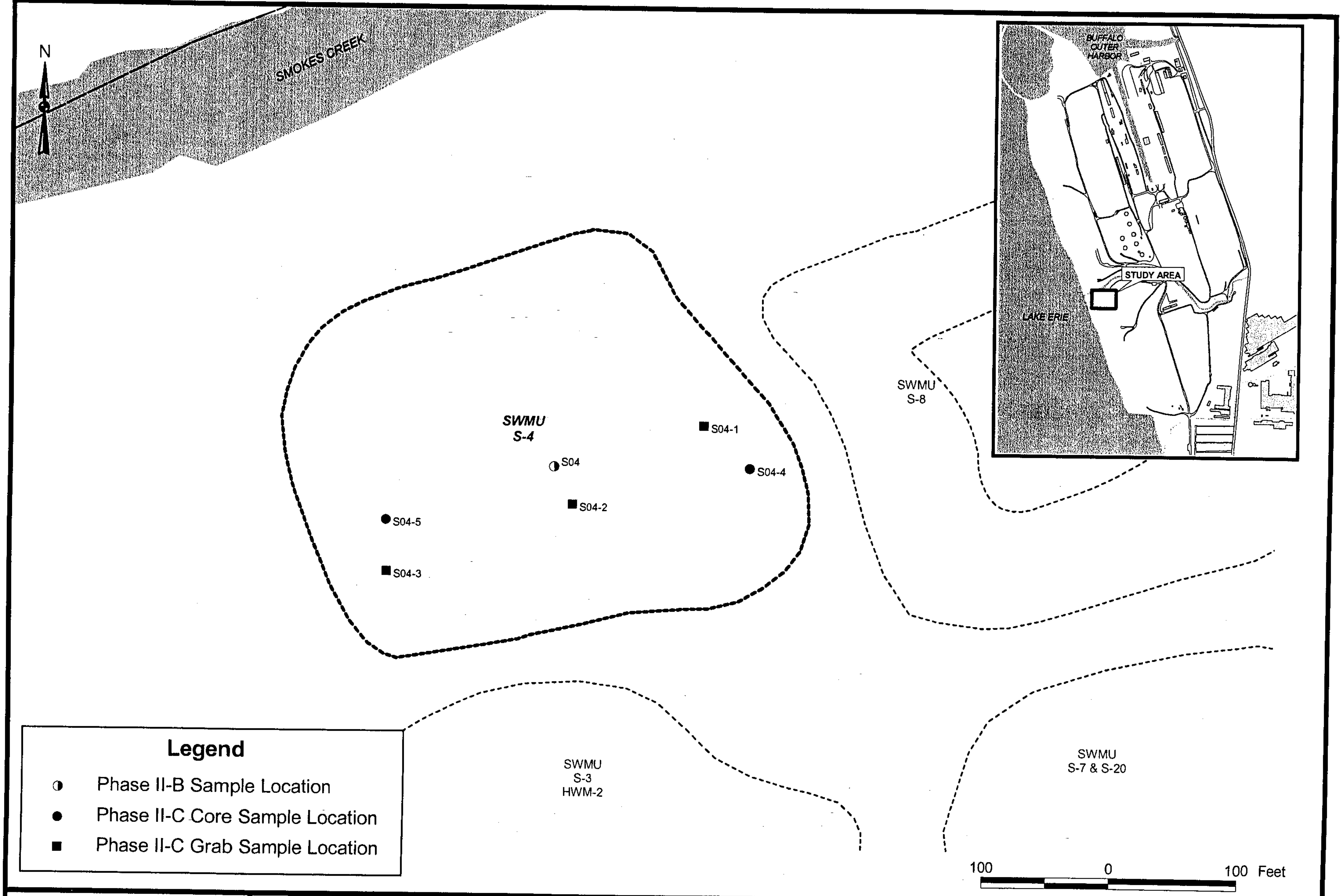


URS

BETHLEHEM STEEL CORPORATION
SITE LOCATION FOR SURFACE IMPOUNDMENT B (SWMU S-2)
SOIL SAMPLE LOCATIONS

FIGURE 3

J:\4200008bsc.15\gis\PRESENT\swmu_report\zone2swmu.apr SWMU S-4 SAMPLING LOCATIONS
10/10/2001

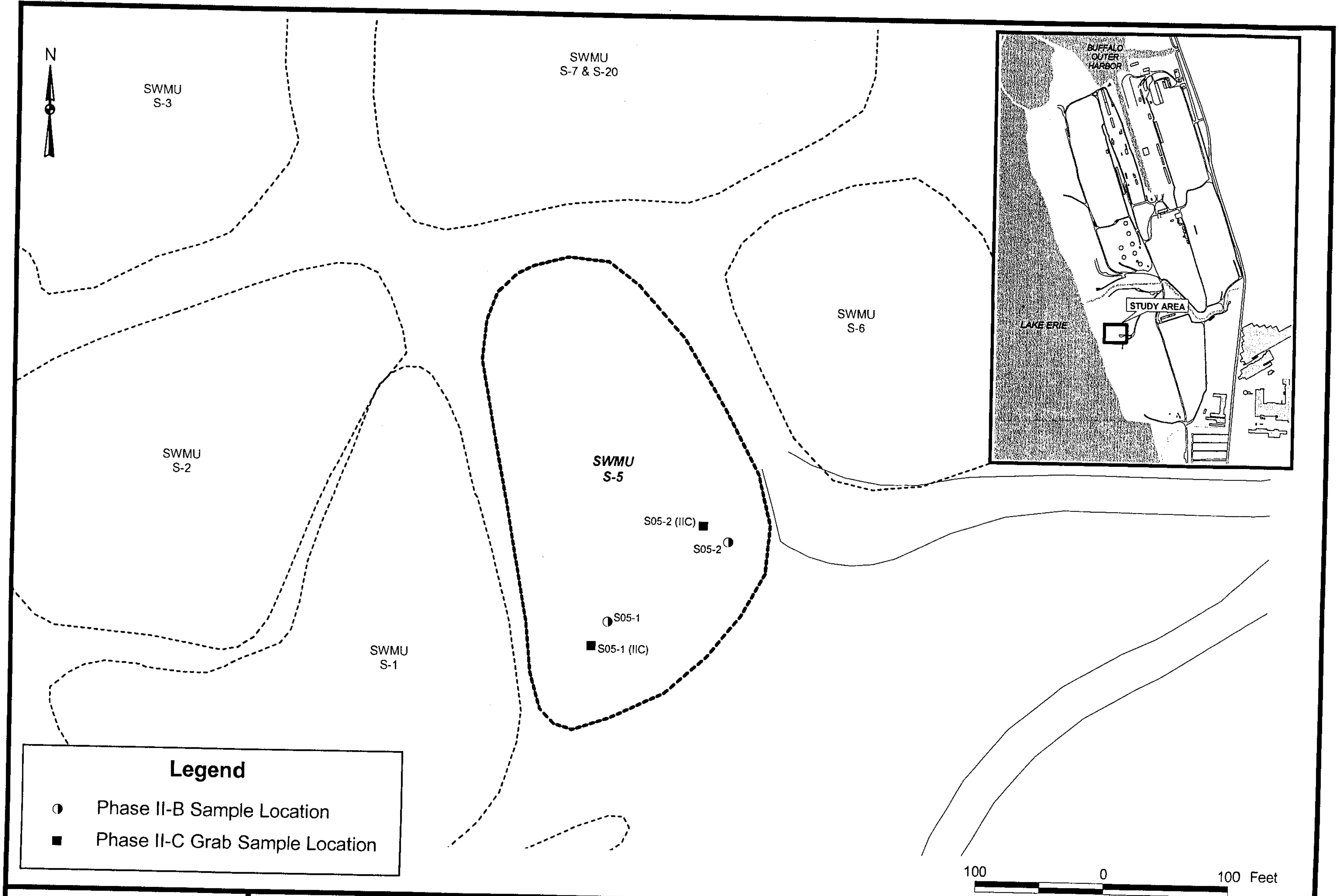


URS

BETHLEHEM STEEL CORPORATION
SITE LOCATION FOR SURFACE IMPOUNDMENT D (SWMU S-4)
SOIL SAMPLE LOCATIONS

FIGURE 4

J:\4200008bsc.15\gis\PRESENT\swmu_report\zone2swmu.apr SWMU S-5 SAMPLING LOCATIONS
10/10/2001

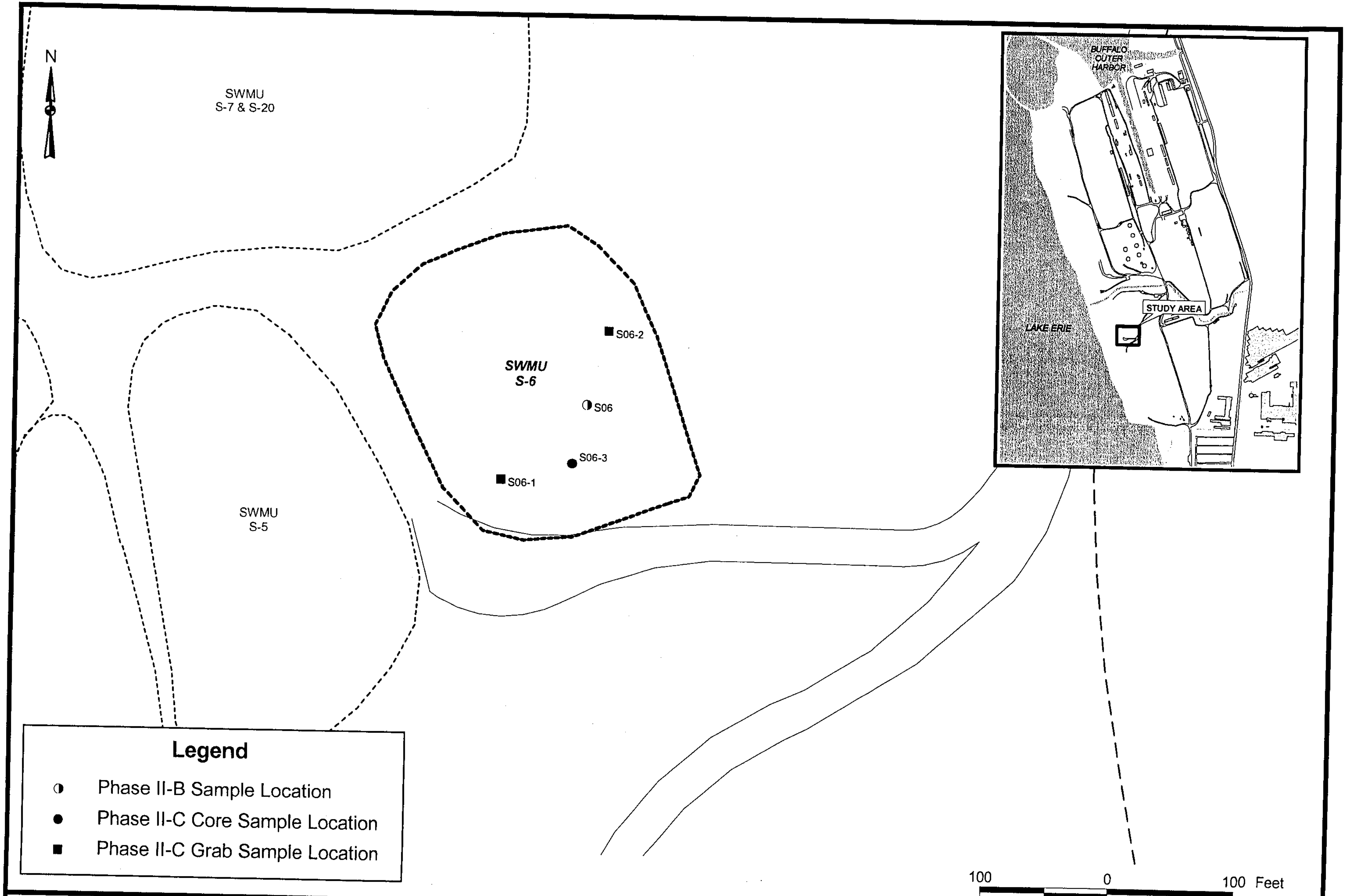


URS

BETHLEHEM STEEL CORPORATION
SITE LOCATION FOR SURFACE IMPOUNDMENT E (SWMU S-5)
SOIL SAMPLE LOCATIONS

FIGURE 5

J:\4200008bsc.15\gis\PRESENT\swmu_report\zone2swmu.apr SWMU S-6 SAMPLING LOCATIONS
10/10/2001

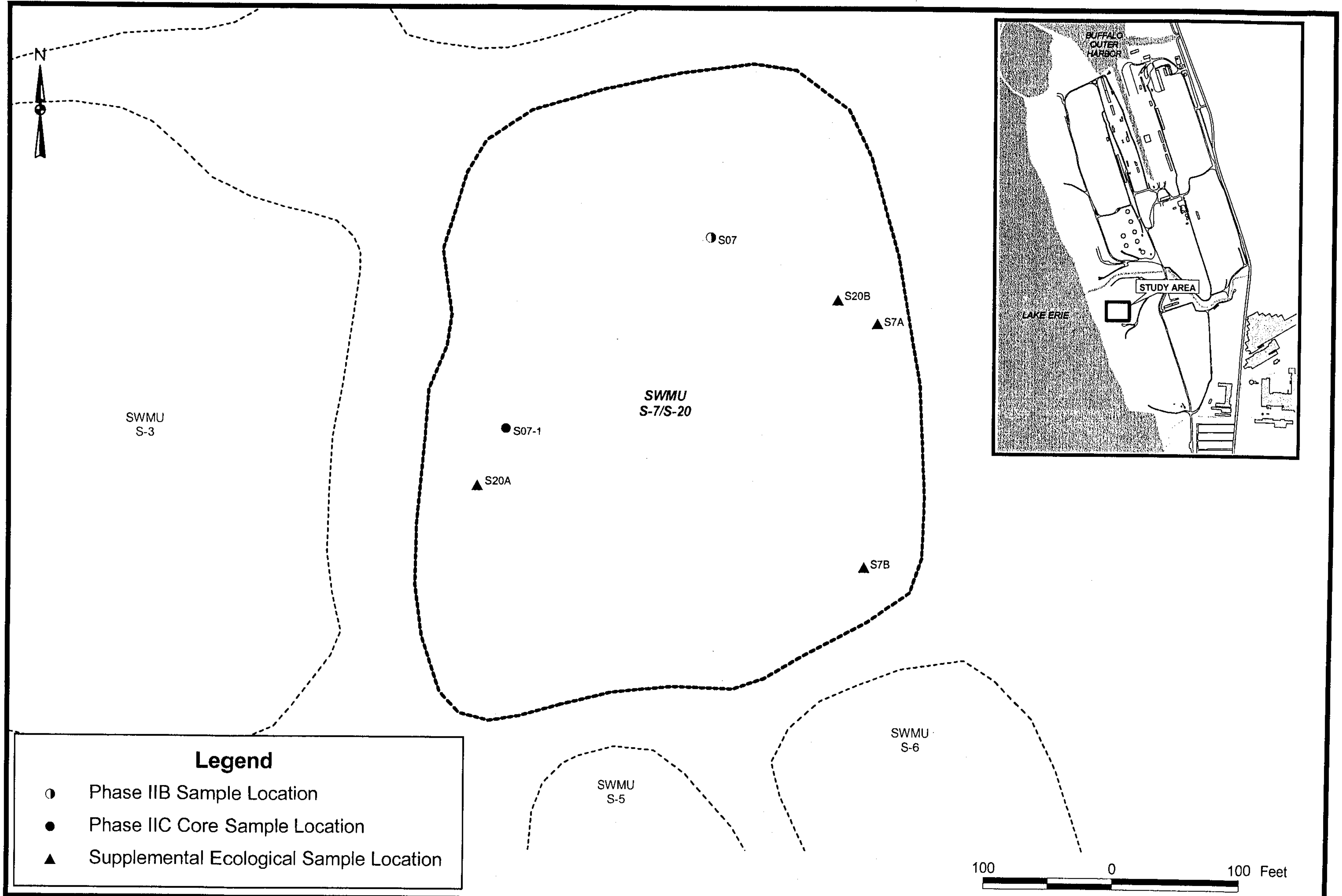


URS

BETHLEHEM STEEL CORPORATION
SITE LOCATION FOR SURFACE IMPOUNDMENT F (SWMU S-6)
SOIL SAMPLE LOCATIONS

FIGURE 6

J:\4200008bsc.15\gis\PRESENT\swmu_report\zone2swmu.apr SWMU S-7 SAMPLING LOCATIONS
1/14/2002

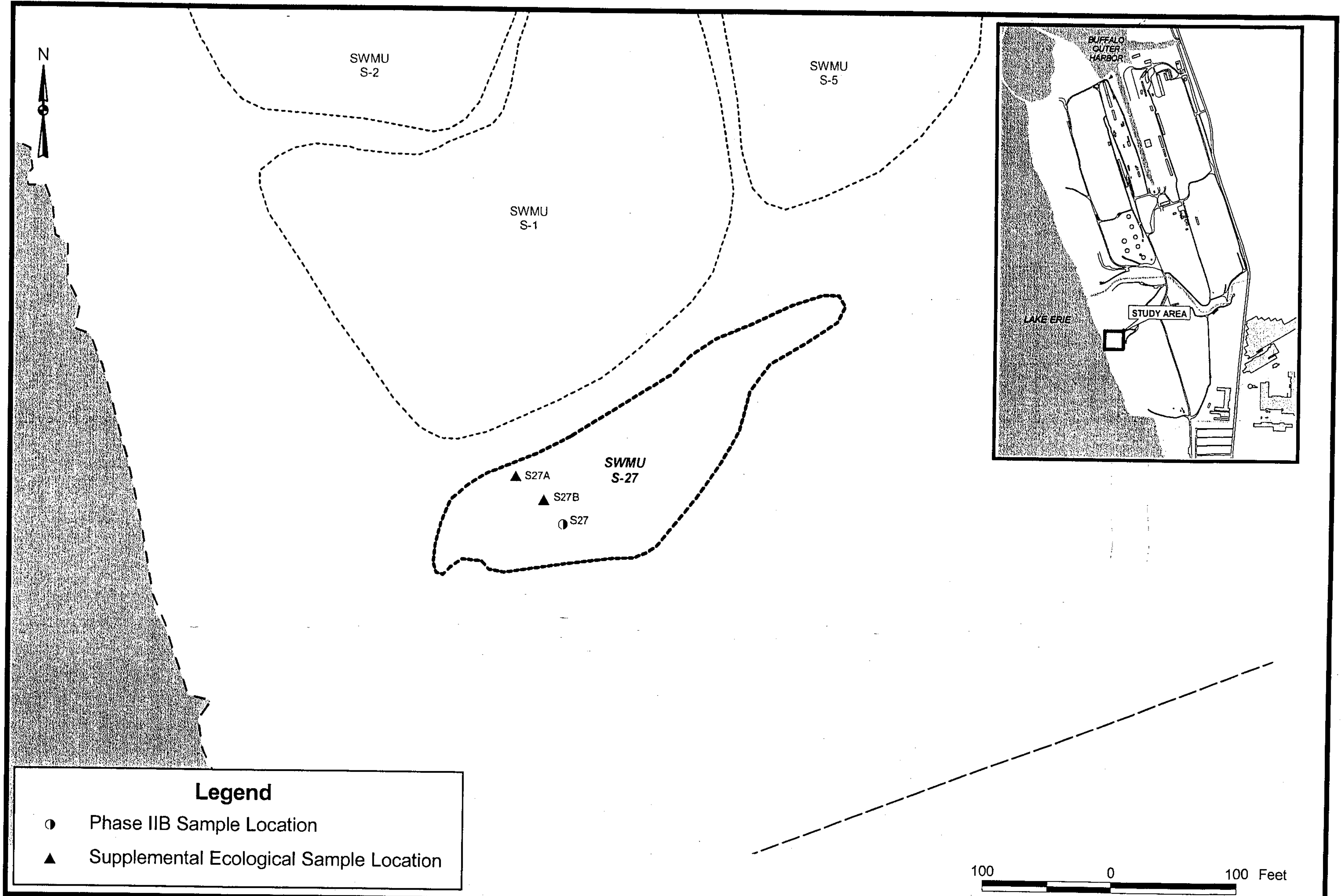


URS

BETHLEHEM STEEL CORPORATION
SITE LOCATION FOR SURFACE IMPOUNDMENT G (SWMU S-7/S-20)
SOIL SAMPLE LOCATIONS

FIGURE 7

J:\4200008bsc.15\gis\PRESENT\swmu_report\zone2swmu.apr SWMU S-27 SAMPLING LOCATIONS
1/14/2002

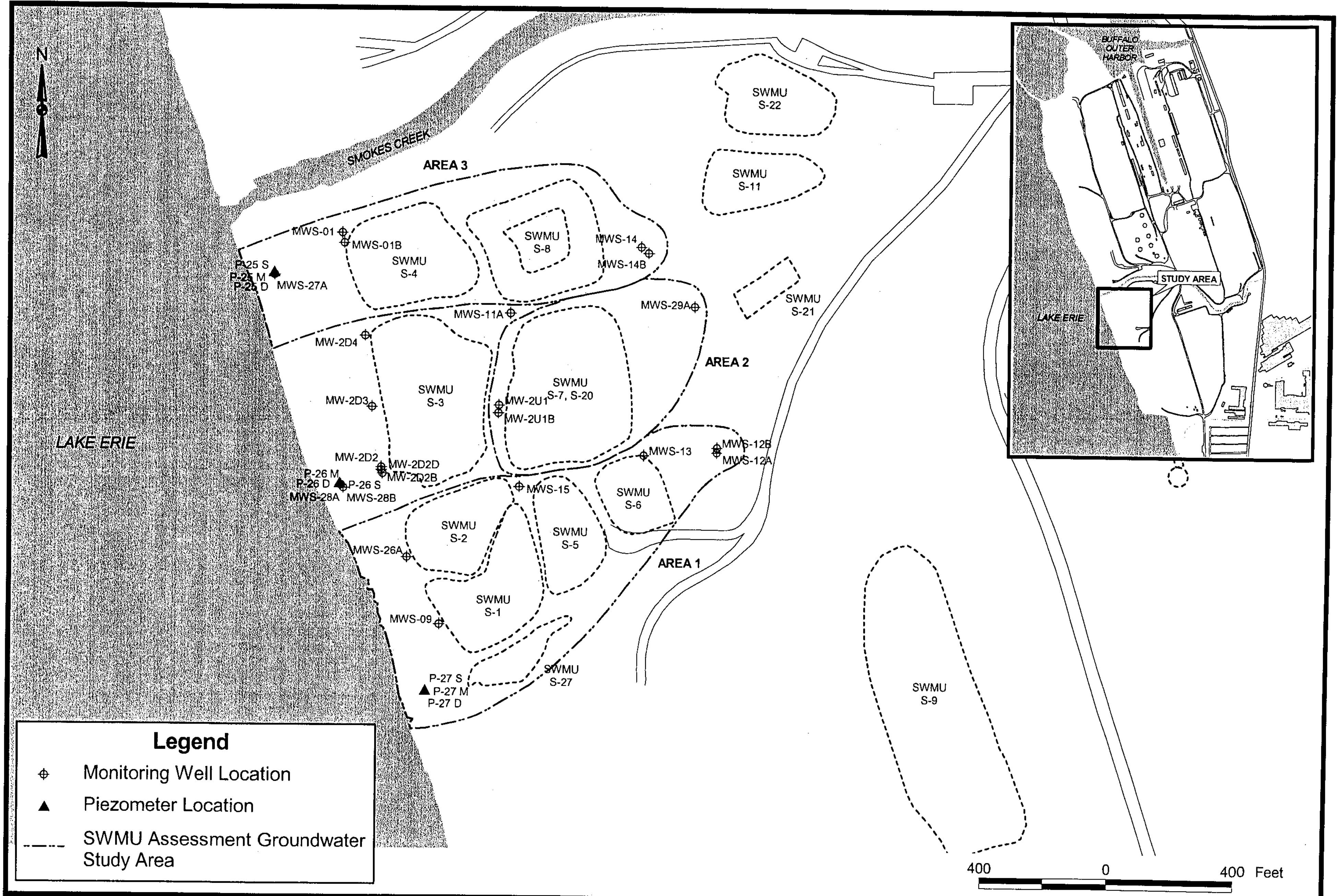


URS

BETHLEHEM STEEL CORPORATION
SITE LOCATION FOR SLUDGE DISPOSAL AREA (SWMU S-27)
SOIL SAMPLE LOCATIONS

FIGURE 8

J:\4200008bsc.15\gis\PRESENT\swmu_report\zone2swmu.apr MONITORING WELL LOCATIONS
10/10/2001

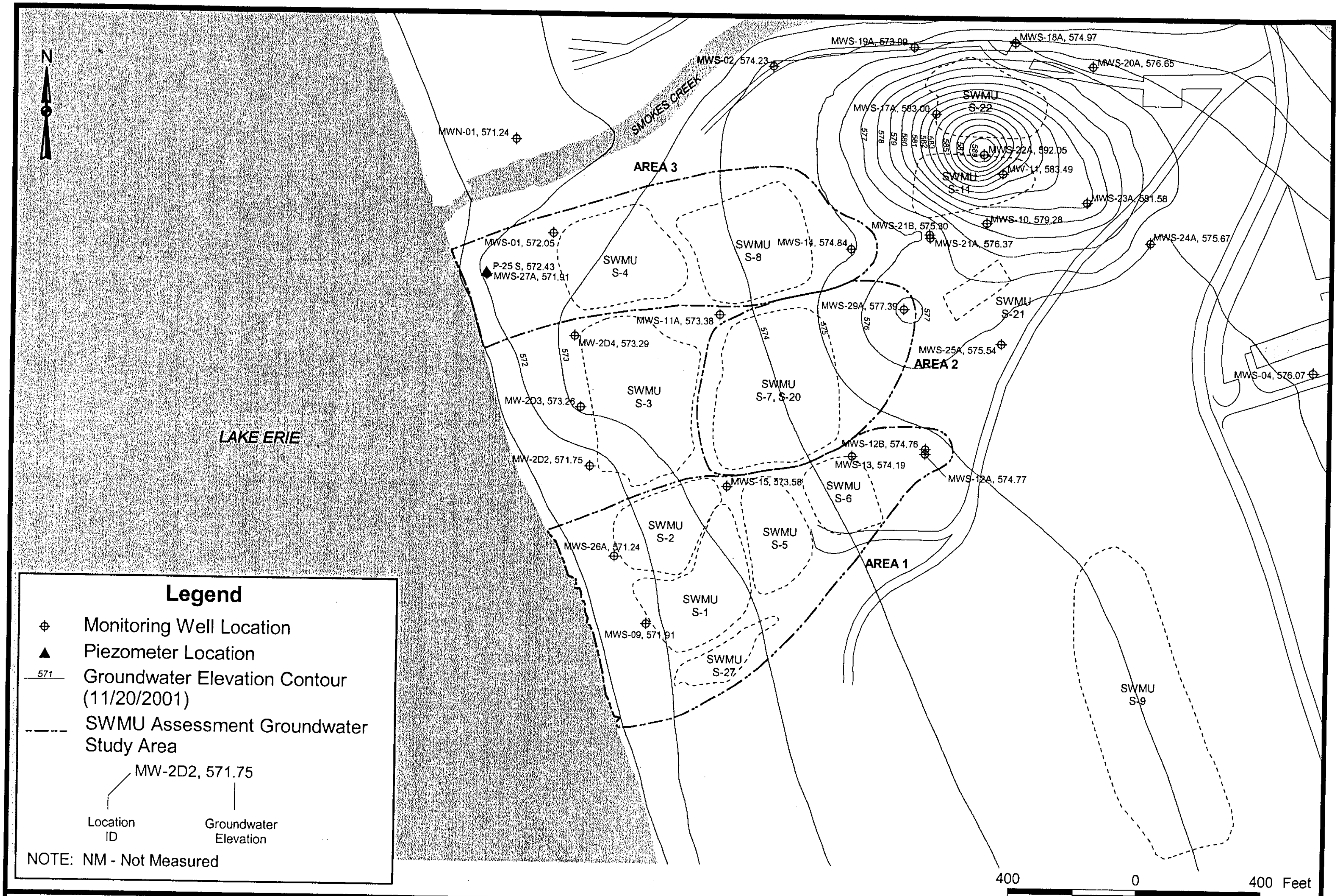


URS

BETHLEHEM STEEL CORPORATION
MONITORING WELL/PIEZOMETER LOCATION MAP

FIGURE 9

N:\11172630.00000\GIS\PRESENT\swmu_report\zone2swmu.apr 11/01 FILL GROUNDWATER ELEVATIONS
12/17/2002

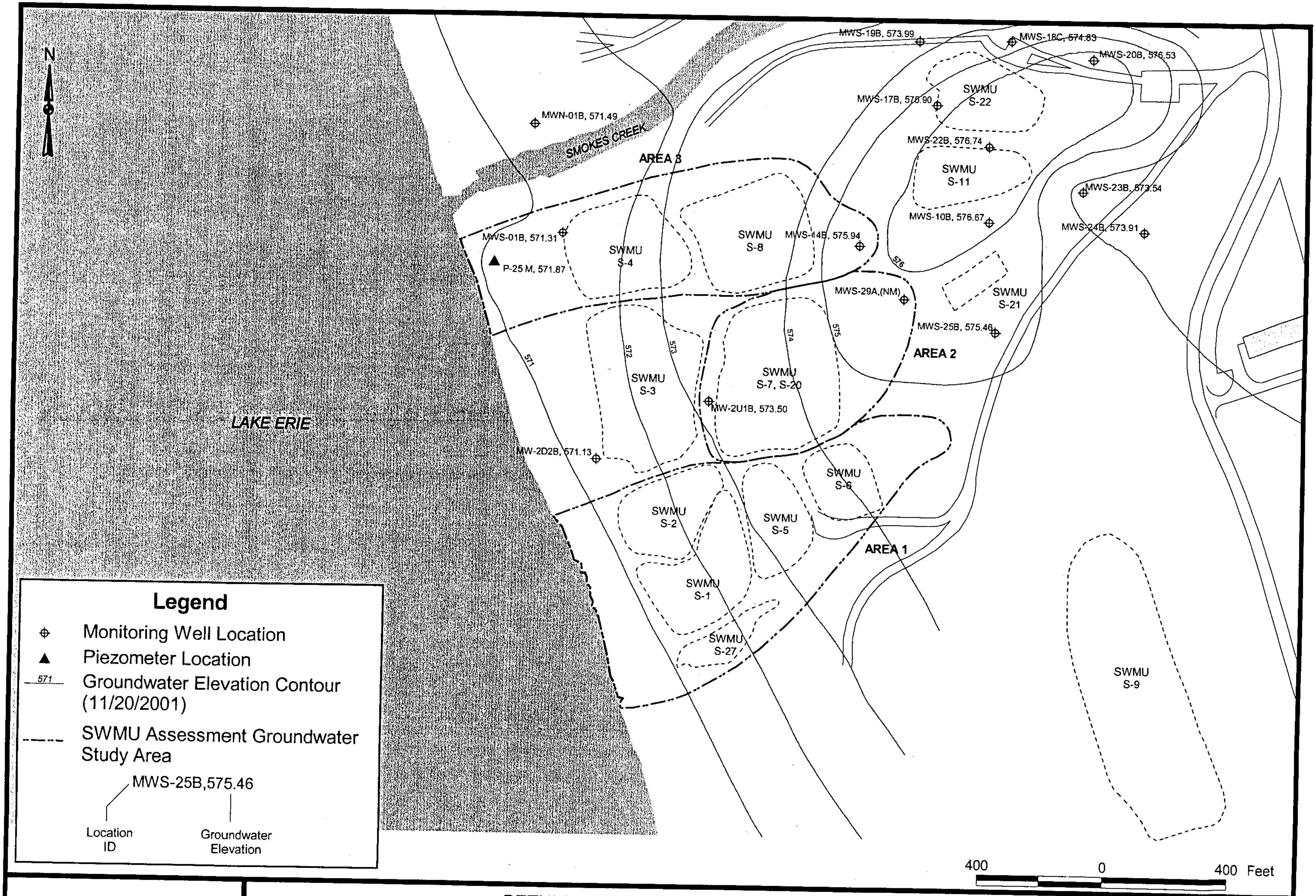


URS

BETHLEHEM STEEL CORPORATION
MONITORING WELL/PIEZOMETER LOCATION MAP WITH GROUNDWATER ELEVATION CONTOURS (FILL UNIT)

FIGURE 10

N:\11172630.00000\GIS\PRESENT\swmu_report\zone2swmu.apr 11/01 SAND GROUNDWATER ELEVATIONS
12/17/2002



URS

BETHLEHEM STEEL CORPORATION
MONITORING WELL/PIEZOMETER LOCATION MAP WITH GROUNDWATER ELEVATION CONTOURS (SAND UNIT)

FIGURE 11

TABLE 1
SITE-SPECIFIC HAZARDOUS CONSTITUENTS AND INDICATOR PARAMETERS

PARAMETER		
Volatile Organic Compounds	**Semivolatile Organic Compounds**	**Metals**
Acrylonitrile	Acenaphthylene	Antimony
Benzene*	Anthracene	Arsenic
Bromochloromethane	Benzo(a)Anthracene	Barium
Bromodichloromethane	Benzo(a)Pyrene	Cadmium
Bromoform	Butyl benzyl phthalate	Calcium
Bromomethane	4-Chloro-3-Methylphenol	Chromium*
Carbon tetrachloride	bis(2-Chloroethyl)ether	Lead*
Chlorobenzene	2-Chloronaphthalene	Magnesium
Chloroethane	Chrysene	Mercury
2-Chloroethyl vinyl ether	1,2-Dichlorobenzene	Nickel
Chloroform	1,3-Dichlorobenzene	Potassium
Chloromethane	1,4-Dichlorobenzene	Selenium
Dibromochloromethane	Di-n-butyl phthalate	Silver
Dichlorodifluoromethane	Di-n-octyl phthalate	Sodium
1,1-Dichloroethane	2,4-Dichlorophenol	Thallium
1,2-Dichloroethane	Diethyl phthalate	
1,1-Dichloroethene	Dimethyl phthalate	
trans-1,2-Dichloroethene	2,4-Dimethylphenol	**Indicator Parameters**
1,2-Dichloropropane	4,6-Dinitro-2-Methylphenol	Alkalinity (CaCO3 to pH 4.5)
cis-1,3-Dichloropropene	2,4-Dinitrotoluene	Alkalinity Total
trans-1,3-Dichloropropene	2,6-Dinitrotoluene	Chloride
Ethylbenzene	bis(2-Ethylhexyl)Phthalate	Cyanide
Methylene chloride	Fluoranthene	Sulfate
1,1,1,2-Tetrachloroethane	Fluorene	Total Organic Carbon
1,1,2,2-Tetrachloroethane	Hexachlorobenzene	Total Dissolved Solids
Tetrachloroethene	Hexachlorobutadiene	Total Organic Halogens
Toluene	Hexachlorocyclopentadiene	Total Recoverable Phenolics
1,1,1-Trichloroethane	Hexachloroethane	
1,1,2-Trichloroethane	Isophorone	
Trichloroethene	3-Methylphenol & 4-Methylphenol	
Trichlorofluoromethane	2-Methylphenol	
Vinyl chloride	Naphthalene*	
Xylenes, Total	Pentachlorophenol	
	Phenanthrene	
	Phenol	
	Pyrene	
	Pyridine	
	2,3,4,6-Tetrachlorophenol	
	1,2,4-Trichlorobenzene	
	2,4,5-Trichlorophenol	
	2,4,6-Trichlorophenol	

Notes:

* Benzene, chromium, lead, naphthalene, and phenolic compounds represent hazardous metals and organic compounds that are generally prevalent in iron and steel industry wastes and which have been found at varying levels during previous groundwater monitoring studies at the Lackawanna site. These pollutants were also selected by EPA for regulation under 40 CFR 420 (EPA's effluent limitations specific for the iron and steel manufacturing point source category) and cover each major family of hazardous constituents—chromium and lead for metals; benzenes for volatile organics; naphthalene for base/neutral semi-volatile organics; and phenolics for acid extractable semi-volatile organics.

DATA VALIDATION QUALIFYING FLAGS

U – Compound was analyzed for but not detected above the sample quantitation limit

J – Analyte was positively identified; associated numerical value is an approximation of the analyte concentration

N – Analysis indicates the presence of an analyte for which there is presumed evidence to make a tentative identification

NJ – Analysis indicates the presence of an analyte that has been " tentatively identified" and the numerical value represents the approximate concentration

UJ – Analyte was not detected above the reported samples quantitation limit; associated numerical value is an approximation of the quantitation limit

B – Metals only: The analyte was detected above instrument detection limits (IDL); the reported concentration is below the contract required detection limit (CRDL)

R – Sample results are rejected due to serious deficiencies in ability to analyze the sample and meet quality control criteria

D – The sample results are reported from a secondary dilution analysis.

Data validation qualifying flags are used in conjunction with reason codes summarized below.

Organics	Metals
c – Calibration failure; poor or unstable response	a – Analytical sequence deficiency or omission
d – Matrix spike/matrix spike duplicate imprecision	c – Calibration verification failure
e – Laboratory duplicate control sample imprecision	d – Matrix duplicate imprecision
f – Field replicate or duplicate imprecision	e – Laboratory duplicate control sample imprecision
g – Poor chromatography	f – Field replicate or duplicate imprecision
h – Holding time violation	h – Holding time violation
i – Internal standard failure	k – Serial dilution imprecision
j – Poor mass spectrographic performance	l – Laboratory control sample recovery failure
l – Laboratory control sample recovery failure	m – Matrix spike recovery failure
m – Matrix spike/matrix spike duplicate recovery failure	n- Interference check sample recovery failure
r – Linearity failure in initial calibration	o – Calibration blank contamination
s – Surrogate spike recovery failure	p – Preparation blank contamination
t – Instrument tuning failure	r – Linearity failure in calibration or MSA analysis
w – Relative retention time failure	v – Post digestion spike failure
x – Field blank contamination	x – Field blank contamination
y – Trip blank contamination	z – Laboratory storage blank contamination
z – Method blank contamination	Q – Other – total/dissolved imprecision
Q - Other	--

Note: NA – Not analyzed for that compound

TABLE 2
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-1

Location ID		S-1-1	S-1-1	S-1-2	S-1-2	S01-1
Sample ID		S-1-1	S-1-1	S-1-2	S-1-2	S01-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-24.0	6.0-8.0	0.0-8.0	4.0-6.0	0.0-0.5
Date Sampled		06/01/94	06/01/94	06/02/94	06/02/94	02/09/95
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/KG	NA	49	NA	35 U	1,600
Ethylbenzene	UG/KG	NA	37 U	NA	35 U	2,500
Methyl ethyl ketone	UG/KG	NA	370 UJ,c	NA	350 UJ,c	590 J,c
Methylene chloride	UG/KG	NA	130	NA	48 J	1,400 U
Toluene	UG/KG	NA	42	NA	20 J	3,600
Xylenes, Total	UG/KG	NA	110 J	NA	51	12,000
Volatile Organic Compounds - SPLP						
Benzene -SPLP	MG/L	NA	0.025 U	NA	0.025 U	0.045
Ethylbenzene -SPLP	MG/L	NA	0.025 U	NA	0.025 U	0.011
Methylene chloride -SPLP	MG/L	NA	0.030 J	NA	0.030 J	0.010 U
Toluene -SPLP	MG/L	NA	0.025 U	NA	0.020 J	0.039
Xylenes, Total -SPLP	MG/L	NA	0.025 U	NA	0.025 U	0.048
Semivolatile Organic Compounds						
Acenaphthene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,j
Acenaphthylene	UG/KG	17,000 U	NA	16,000 U	NA	91,000 UJ,j
Anthracene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,j
Benzo(a)anthracene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,j
Benzo(a)pyrene	UG/KG	17,000 UJ,g	NA	16,000 U	NA	91,000 UJ,j
Benzo(b)fluoranthene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,j
Benzo(ghi)perylene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,c
Benzo(k)fluoranthene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,j
Chrysene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,j
Dibenz(a,h)anthracene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,c
Fluoranthene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,j

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2
SUMMARY OF DETECTED ANALYTES IN SOIL TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-1

Location ID		S-1-1	S-1-1	S-1-2	S-1-2	S01-1
Sample ID		S-1-1	S-1-1	S-1-2	S-1-2	S01-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-24.0	6.0-8.0	0.0-8.0	4.0-6.0	0.0-0.5
Date Sampled		06/01/94	06/01/94	06/02/94	06/02/94	02/09/95
Parameter	Units					
Semivolatile Organic Compounds						
Fluorene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,j
Indeno(1,2,3-cd)pyrene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,c
3-Methylphenol & 4-Methylphenol	UG/KG	13,000 J	NA	5,300 J	NA	91,000 UJ,j
Naphthalene	UG/KG	16,000 J	NA	16,000 U	NA	91,000 U
Phenanthrene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,j
Phenol	UG/KG	11,000 J	NA	16,000 U	NA	91,000 UJ,j
Pyrene	UG/KG	17,000 UJ,g	NA	16,000 UJ,g	NA	91,000 UJ,j
Semivolatile Organic Compounds - SPLP						
Acenaphthene -SPLP	MG/L	0.080 U	NA	0.020 U	NA	0.062 J,j
Acenaphthylene -SPLP	MG/L	0.080 U	NA	0.020 U	NA	0.026 J,j
Anthracene -SPLP	MG/L	0.080 U	NA	0.020 U	NA	0.02 J,j
2,4-Dimethylphenol -SPLP	MG/L	0.12	NA	0.040	NA	0.22 J,j
Fluoranthene -SPLP	MG/L	0.080 U	NA	0.020 U	NA	0.024
Fluorene -SPLP	MG/L	0.080 U	NA	0.020 U	NA	0.097 J,j
3-Methylphenol & 4-Methylphenol -SPLP	MG/L	0.97	NA	NA	NA	0.18
2-Methylphenol -SPLP	MG/L	0.045 J	NA	0.020 U	NA	0.22
Naphthalene -SPLP	MG/L	0.036 J	NA	0.020 U	NA	0.008 J,j
Phenanthrene -SPLP	MG/L	0.080 U	NA	0.020 U	NA	0.068 J,j
Phenol -SPLP	MG/L	0.87	NA	0.18	NA	0.049
Pyrene -SPLP	MG/L	0.080 U	NA	0.020 U	NA	0.012 J
Metals						
Arsenic	MG/KG	20.4 J,m	NA	24.1 J,m	NA	9.2 J,m
Barium	MG/KG	32.5 J,m	NA	23.9 UJ,m	NA	23.0 U
Cadmium	MG/KG	3.2 UR,m	NA	3.4 J,m	NA	14.4 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-1

Location ID		S-1-1	S-1-1	S-1-2	S-1-2	S01-1
Sample ID		S-1-1	S-1-1	S-1-2	S-1-2	S01-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-24.0	6.0-8.0	0.0-8.0	4.0-6.0	0.0-0.5
Date Sampled		06/01/94	06/01/94	06/02/94	06/02/94	02/09/95
Parameter	Units					
Metals						
Calcium	MG/KG	NA	NA	NA	NA	22,500 R,m
Chromium	MG/KG	137 J,m	NA	98.8	NA	109 R,m
Lead	MG/KG	273	NA	278	NA	221 J,c
Mercury	MG/KG	0.17	NA	0.12 U	NA	5.6
Nickel	MG/KG	135 J,m	NA	102 J	NA	139
Selenium	MG/KG	8.6	NA	11.1	NA	0.57 UJ
Silver	MG/KG	1.5 J,m	NA	2.1 J,m	NA	28.7 U
Metals-SPLP						
Antimony -SPLP	MG/L	0.060 U	NA	0.17	NA	NA
General Chemistry Parameters						
Chloride	MG/KG	NA	NA	NA	NA	24.9 J,e
Cyanide	MG/KG	22.3	NA	19.5	NA	32.2
Cyanide - Leachable	MG/L	0.10	NA	0.11	NA	NA
PHSOL	S.U.	NA	NA	NA	NA	8.9 J,h
Total Organic Carbon	MG/KG	NA	NA	NA	NA	145,000
Total Organic Halogens	MG/KG	NA	NA	NA	NA	34.5
Total Recoverable Phenolics	MG/KG	NA	NA	NA	NA	51.1
Total Solids	PERCENT	77.3	66.9	83.7	70.5	NA
Miscellaneous - SPLP						
Cyanide -SPLP	MG/L	0.054	NA	0.055	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-1

Location ID		**S01-2**
Sample ID		**S01-2**
Matrix		**Soil**
Depth Interval (ft)		**0.0-0.5**
Date Sampled		**02/09/95**
Parameter	**Units**	
Volatile Organic Compounds		
Benzene	UG/KG	3.6 J
Ethylbenzene	UG/KG	5.3 U
Methyl ethyl ketone	UG/KG	4.6 J,c
Methylene chloride	UG/KG	11 U
Toluene	UG/KG	5.3 U
Xylenes, Total	UG/KG	5.3 U
Volatile Organic Compounds - SPLP		
Benzene -SPLP	MG/L	0.0050 U
Ethylbenzene -SPLP	MG/L	0.0050 U
Methylene chloride -SPLP	MG/L	0.010 U
Toluene -SPLP	MG/L	0.0050 U
Xylenes, Total -SPLP	MG/L	0.0050 U
Semivolatile Organic Compounds		
Acenaphthene	UG/KG	170,000
Acenaphthylene	UG/KG	200,000
Anthracene	UG/KG	460,000
Benzo(a)anthracene	UG/KG	630,000
Benzo(a)pyrene	UG/KG	330,000
Benzo(b)fluoranthene	UG/KG	490,000
Benzo(ghi)perylene	UG/KG	170,000 J,c
Benzo(k)fluoranthene	UG/KG	150,000 J
Chrysene	UG/KG	540,000
Dibenz(a,h)anthracene	UG/KG	38,000 J,c
Fluoranthene	UG/KG	1,500,000

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2
SUMMARY OF DETECTED ANALYTES IN SOIL TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-1

Location ID		S01-2
Sample ID		S01-2
Matrix		Soil
Depth Interval (ft)		0.0-0.5
Date Sampled		02/09/95
Parameter	Units	
Semivolatile Organic Compounds		
Fluorene	UG/KG	710,000
Indeno(1,2,3-cd)pyrene	UG/KG	210,000 J,c
3-Methylphenol & 4-Methylphenol	UG/KG	170,000 U
Naphthalene	UG/KG	1,500,000
Phenanthrene	UG/KG	1,900,000
Phenol	UG/KG	170,000 U
Pyrene	UG/KG	1,200,000
Semivolatile Organic Compounds - SPLP		
Acenaphthene -SPLP	MG/L	NA
Acenaphthylene -SPLP	MG/L	NA
Anthracene -SPLP	MG/L	NA
2,4-Dimethylphenol -SPLP	MG/L	NA
Fluoranthene -SPLP	MG/L	NA
Fluorene -SPLP	MG/L	NA
3-Methylphenol & 4-Methylphenol -SPLP	MG/L	NA
2-Methylphenol -SPLP	MG/L	NA
Naphthalene -SPLP	MG/L	NA
Phenanthrene -SPLP	MG/L	NA
Phenol -SPLP	MG/L	NA
Pyrene -SPLP	MG/L	NA
Metals		
Arsenic	MG/KG	7 J,m
Barium	MG/KG	21.9
Cadmium	MG/KG	13.3 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-1

Location ID		S01-2
Sample ID		S01-2
Matrix		Soil
Depth Interval (ft)		0.0-0.5
Date Sampled		02/09/95
Parameter	**Units**	
Metals		
Calcium	MG/KG	4,890 R,m
Chromium	MG/KG	57.8 R,m
Lead	MG/KG	54.1 J,c
Mercury	MG/KG	0.11 U
Nickel	MG/KG	107 U
Selenium	MG/KG	0.53 U
Silver	MG/KG	26.7 U
Metals-SPLP		
Antimony -SPLP	MG/L	NA
General Chemistry Parameters		
Chloride	MG/KG	5 J,e
Cyanide	MG/KG	2.7 U
Cyanide - Leachable	MG/L	NA
PHSOL	S.U.	7.5 J,h
Total Organic Carbon	MG/KG	37,100
Total Organic Halogens	MG/KG	27.1
Total Recoverable Phenolics	MG/KG	3.9
Total Solids	PERCENT	NA
Miscellaneous - SPLP		
Cyanide -SPLP	MG/L	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2A
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-2

Location ID		S02	S02	S02-1	S02-2	S02-3
Sample ID		S02	S02	S02-1	S02-2	S02-3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-26.0	12.0-14.0	0.0-0.5	0.0-0.5	0.0-27.3
Date Sampled		06/02/94	06/02/94	02/09/95	02/09/95	02/24/95
Parameter	Units					
Volatile Organic Compounds						
Benzene	UG/KG	NA	7.5 U	6.8 U	6.8 U	NA
1,2-Dichloroethane	UG/KG	NA	7.5 U	6.8 U	6.8 U	NA
Ethylbenzene	UG/KG	NA	7.5 U	6.8 U	6.8 U	NA
Methylene chloride	UG/KG	NA	15 U	5.1 J	14 UJ	NA
Toluene	UG/KG	NA	7.5 U	6.8 U	6.8 U	NA
1,1,1-Trichloroethane	UG/KG	NA	54	6.8 U	6.8 U	NA
Xylenes, Total	UG/KG	NA	7.5 U	6.8 U	6.8 U	NA
Volatile Organic Compounds - SPLP						
Methyl ethyl ketone -SPLP	MG/L	NA	0.25 U	0.050 U	0.050 U	NA
Methylene chloride -SPLP	MG/L	NA	0.040 J	0.010 U	0.010 U	NA
Toluene -SPLP	MG/L	NA	0.025 U	0.0026 J	0.0050 U	NA
Trichloroethene -SPLP	MG/L	NA	0.025 U	0.0050 U	0.0050 U	NA
Semivolatile Organic Compounds						
Benzo(a)anthracene	UG/KG	20,000 UJ,g	NA	150 J,j	2,200 U	410 U
Benzo(b)fluoranthene	UG/KG	20,000 UJ,g	NA	340 J,j	2,200 U	130 J
Chrysene	UG/KG	20,000 UJ,g	NA	100 J,j	2,200 U	140 J
Fluoranthene	UG/KG	20,000 UJ,g	NA	96 J,j	2,200 U	160 J
Indeno(1,2,3-cd)pyrene	UG/KG	20,000 UJ,g	NA	92 J,c	2,200 U	410 U
Naphthalene	UG/KG	20,000 U	NA	450 U	2,200 U	2,600
Phenanthrene	UG/KG	20,000 UJ,g	NA	450 UJ,j	2,200 U	180 J
Pyrene	UG/KG	20,000 UJ,g	NA	120 J,j	2,200 U	170 J
Semivolatile Organic Compounds - SPLP						
Naphthalene -SPLP	MG/L	0.010 U	NA	NA	NA	0.21

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2A
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-2

Location ID		S02	S02	S02-1	S02-2	S02-3
Sample ID		S02	S02	S02-1	S02-2	S02-3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-26.0	12.0-14.0	0.0-0.5	0.0-0.5	0.0-27.3
Date Sampled		06/02/94	06/02/94	02/09/95	02/09/95	02/24/95
Parameter	**Units**					
Metals						
Antimony	MG/KG	8.9 U	NA	61.5 J,m	204 UJ,m	37.2 UR,m
Arsenic	MG/KG	26.8 J,c	NA	11.1 J,m	18.6 J,m	26.5 J,m
Barium	MG/KG	39.9 J,m	NA	27.3 U	33.4	31.4
Cadmium	MG/KG	28.9	NA	3.9 J,m	17.0 U	7 J,m
Calcium	MG/KG	NA	NA	85,400 R,m	75,300 R,m	42,400
Chromium	MG/KG	132	NA	167 R,m	188 R,m	125
Lead	MG/KG	1,630	NA	1,120 J,c	916 J,c	856 J,m
Mercury	MG/KG	0.15 U	NA	0.14 U	0.66	0.16
Nickel	MG/KG	54.7 J	NA	24.7 J,c	136 U	52.3
Selenium	MG/KG	2.3	NA	0.68 UJ	1.9	3.1 UR,m
Silver	MG/KG	6.1 J,m	NA	1.4 U	34.0 U	6.2 U
Thallium	MG/KG	1.5 U	NA	1.4 UJ	1.4 UJ	1.9 J,ms
Metals-SPLP						
Calcium -SPLP	MG/L	NA	NA	NA	NA	20.9
General Chemistry Parameters						
Chloride	MG/KG	NA	NA	9.3 J,e	10.3 J,e	188
Cyanide	MG/KG	NA	NA	3.4 U	3.4 U	24.2
PHSOL	S.U.	NA	NA	11.1 J,h	10.6 J,h	8.1 J,h
Sulfate	MG/KG	NA	NA	68.3 U	67.9 U	103
Total Organic Carbon	MG/KG	NA	NA	6,780	27,500	26,500
Total Organic Halogens	MG/KG	NA	NA	20.9	2.4 U	35
Miscellaneous - SPLP						
Cyanide -SPLP	MG/L	0.025	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2A
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-2

Location ID		S02-3
Sample ID		S02-3
Matrix		Soil
Depth Interval (ft)		16.0-18.0
Date Sampled		02/24/95
Parameter	**Units**	
Volatile Organic Compounds		
Benzene	UG/KG	29
1,2-Dichloroethane	UG/KG	5
Ethylbenzene	UG/KG	12
Methylene chloride	UG/KG	25 U
Toluene	UG/KG	60
1,1,1-Trichloroethane	UG/KG	25 U
Xylenes, Total	UG/KG	340
Volatile Organic Compounds - SPLP		
Methyl ethyl ketone -SPLP	MG/L	0.004 R,cz
Methylene chloride -SPLP	MG/L	0.024 J,h
Toluene -SPLP	MG/L	0.012 U,z
Trichloroethene -SPLP	MG/L	0.003 J,h
Semivolatile Organic Compounds		
Benzo(a)anthracene	UG/KG	NA
Benzo(b)fluoranthene	UG/KG	NA
Chrysene	UG/KG	NA
Fluoranthene	UG/KG	NA
Indeno(1,2,3-cd)pyrene	UG/KG	NA
Naphthalene	UG/KG	NA
Phenanthrene	UG/KG	NA
Pyrene	UG/KG	NA
Semivolatile Organic Compounds - SPLP		
Naphthalene -SPLP	MG/L	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2A
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-2

Location ID		**S02-3**
Sample ID		**S02-3**
Matrix		**Soil**
Depth Interval (ft)		**16.0-18.0**
Date Sampled		**02/24/95**
Parameter	**Units**	
Metals		
Antimony	MG/KG	NA
Arsenic	MG/KG	NA
Barium	MG/KG	NA
Cadmium	MG/KG	NA
Calcium	MG/KG	NA
Chromium	MG/KG	NA
Lead	MG/KG	NA
Mercury	MG/KG	NA
Nickel	MG/KG	NA
Selenium	MG/KG	NA
Silver	MG/KG	NA
Thallium	MG/KG	NA
Metals-SPLP		
Calcium -SPLP	MG/L	NA
General Chemistry Parameters		
Chloride	MG/KG	NA
Cyanide	MG/KG	NA
PHSOL	S.U.	NA
Sulfate	MG/KG	NA
Total Organic Carbon	MG/KG	NA
Total Organic Halogens	MG/KG	NA
Miscellaneous - SPLP		
Cyanide -SPLP	MG/L	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2B
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-4

Location ID		S04	S04	S04-1	S04-2	S04-3
Sample ID		S04	S04	S04-1	S04-2	S04-3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-36.0	22.0-24.0	0.0-0.5	0.0-0.5	0.0-0.5
Date Sampled		06/03/94	06/03/94	02/10/95	02/10/95	02/10/95
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/KG	NA	2,900 J,s	7.2 U	8.1 U	7.9 U
Ethylbenzene	UG/KG	NA	920 UJ,s	7.2 U	8.1 U	7.9 U
Methyl ethyl ketone	UG/KG	NA	9,200 UJ,s	72 UJ,c	81 UJ,c	79 UJ,c
Methylene chloride	UG/KG	NA	1,800 U,z	14 U	16 U	16 U
Toluene	UG/KG	NA	4,300 J,s	7.2 U	8.1 U	7.9 U
Xylenes, Total	UG/KG	NA	5,300 J,s	7.2 U	8.1 U	7.9 U
Volatile Organic Compounds - SPLP						
Benzene -SPLP	MG/L	NA	0.070	0.005 U	0.005 U	0.005 U
Methylene chloride -SPLP	MG/L	NA	0.050 U,z	0.01 U	0.01 U	0.01 U
Toluene -SPLP	MG/L	NA	0.040	0.005 U	0.005 U	0.005 U
1,1,1-Trichloroethane -SPLP	MG/L	NA	0.025 U	0.0028 J	0.005 U	0.005 U
Trichloroethene -SPLP	MG/L	NA	0.025 U	0.005 U	0.005 U	0.005 U
Xylenes, Total -SPLP	MG/L	NA	0.025 U	0.005 U	0.005 U	0.005 U
Semivolatile Organic Compounds						
Acenaphthene	UG/KG	20,000 U	NA	480 UJ,c	1,100 U	1,000 U
Acenaphthylene	UG/KG	20,000 U	NA	480 UJ,c	1,100 U	1,000 U
Anthracene	UG/KG	20,000 UJ,g	NA	480 U	1,100 U	1,000 U
Benzo(a)anthracene	UG/KG	20,000 UJ,g	NA	710	510 J	530 J
Benzo(a)pyrene	UG/KG	20,000 UJ,g	NA	170 J	370 J	360 J
Benzo(b)fluoranthene	UG/KG	20,000 U	NA	800	720 J	840 J
Benzo(ghi)perylene	UG/KG	20,000 U	NA	480 U	280 J	620 J
Benzo(k)fluoranthene	UG/KG	20,000 U	NA	340 J	310 J	1,000 U
Chrysene	UG/KG	20,000 UJ,g	NA	420 J	380 J	450 J
2,4-Dimethylphenol	UG/KG	20,000 U	NA	480 U	1,100 U	1,000 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2B
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-4

Location ID		S04	S04	S04-1	S04-2	S04-3
Sample ID		S04	S04	S04-1	S04-2	S04-3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-36.0	22.0-24.0	0.0-0.5	0.0-0.5	0.0-0.5
Date Sampled		06/03/94	06/03/94	02/10/95	02/10/95	02/10/95
Parameter	**Units**					
Semivolatile Organic Compounds						
bis(2-Ethylhexyl)phthalate	UG/KG	20,000 UJ,g	NA	530	380 J,c	980 J,c
Fluoranthene	UG/KG	20,000 U	NA	840	810 J	850 J
Fluorene	UG/KG	20,000 U	NA	480 UJ,c	1,100 U	1,000 U
Indeno(1,2,3-cd)pyrene	UG/KG	20,000 U	NA	270 J	360 J	460 J
3-Methylphenol & 4-Methylphenol	UG/KG	20,000 U	NA	480 U	1,100 U	1,000 U
Naphthalene	UG/KG	36,000	NA	330 J	280 J	320 J
Phenanthrene	UG/KG	5,200 J	NA	420 J	390 J	400 J
Pyrene	UG/KG	20,000 U	NA	790	770 J	740 J
Semivolatile Organic Compounds - SPLP						
2,4-Dimethylphenol -SPLP	MG/L	0.010 U	NA	NA	NA	NA
3-Methylphenol & 4-Methylphenol -SPLP	MG/L	NA	NA	NA	NA	NA
Metals						
Antimony	MG/KG	9.0 U	NA	21.3 J,m	21.5 J,m	13.3 J,m
Arsenic	MG/KG	31.1 J,c	NA	11.6 J,m	11.9 J,m	12 J,m
Barium	MG/KG	48.7 J,m	NA	71.4	82.4	82.2
Cadmium	MG/KG	31.2 J,m	NA	3.2 J,m	3.3 J,m	3.6 J,m
Calcium	MG/KG	NA	NA	140,000 J,k	189,000 J,k	210,000 J,k
Chromium	MG/KG	154 J,m	NA	49.1 J,m	42.6 J,m	42.6 J,m
Lead	MG/KG	1,010	NA	343 J,k	408 J,k	415 J,k
Mercury	MG/KG	0.20	NA	1.6	0.55	0.83
Nickel	MG/KG	70.6 J,m	NA	34.2	37.7	39.9
Potassium	MG/KG	NA	NA	757	946	962
Selenium	MG/KG	2.6	NA	0.72 UR,c	0.81 UR,c	0.79 UR,c
Silver	MG/KG	5.6 J,m	NA	1.4 U	1.6 U	1.6 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2B
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-4

Location ID		**S04**	**S04**	**S04-1**	**S04-2**	**S04-3**
Sample ID		**S04**	**S04**	**S04-1**	**S04-2**	**S04-3**
Matrix		**Soil**	**Soil**	**Soil**	**Soil**	**Soil**
Depth Interval (ft)		**0.0-36.0**	**22.0-24.0**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**
Date Sampled		**06/03/94**	**06/03/94**	**02/10/95**	**02/10/95**	**02/10/95**
Parameter	**Units**					
Metals-SPLP						
Calcium -SPLP	MG/L	NA	NA	13.4	14.5	15.4
Lead -SPLP	MG/L	0.050 U	NA	0.004	0.005	0.005
Potassium -SPLP	MG/L	NA	NA	5.0 U	5.0 U	5.0 U
Sodium -SPLP	MG/L	NA	NA	5.0 U	5.0 U	5.0 U
General Chemistry Parameters						
Chloride	MG/KG	NA	NA	24.2	21.2	19.4
Cyanide	MG/KG	5.0	NA	10.3	14	13.8
PHSOL	S.U.	NA	NA	8.1 J,h	8 J,h	7.9 J,h
Sulfate	MG/KG	NA	NA	145 U	163 U	158 U
Total Organic Carbon	MG/KG	NA	NA	25,200	28,000	33,600
Total Organic Halogens	MG/KG	NA	NA	30	19.3	23.7
Total Recoverable Phenolics	MG/KG	NA	NA	0.36 U	0.41 U	0.39 U
Total Solids	PERCENT	66.9	68.1	NA	NA	NA
Miscellaneous - SPLP						
Cyanide -SPLP	MG/L	0.028	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2B
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-4

Location ID		S04-4	S04-4	S04-5	S04-5	S04-6
Sample ID		S04-4	S04-4	S04-5	S04-5	S04-6
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-36.0	20.0-22.0	0.0-38.0	26.0-30.0	0.0-38.0
Date Sampled		02/27/95	02/27/95	02/27/95	02/27/95	02/27/95
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/KG	NA	34	NA	910	NA
Ethylbenzene	UG/KG	NA	9 U	NA	140	NA
Methyl ethyl ketone	UG/KG	NA	15 J	NA	180 U	NA
Methylene chloride	UG/KG	NA	18 U	NA	12 J	NA
Toluene	UG/KG	NA	8 J	NA	1,600	NA
Xylenes, Total	UG/KG	NA	10	NA	3,600	NA
Volatile Organic Compounds - SPLP						
Benzene -SPLP	MG/L	NA	0.54	NA	0.026	NA
Methylene chloride -SPLP	MG/L	NA	0.05 U	NA	0.02	NA
Toluene -SPLP	MG/L	NA	0.025 U	NA	0.037	NA
1,1,1-Trichloroethane -SPLP	MG/L	NA	0.025 U	NA	0.005 U	NA
Trichloroethene -SPLP	MG/L	NA	0.025 U	NA	0.004 J	NA
Xylenes, Total -SPLP	MG/L	NA	0.14	NA	0.029	NA
Semivolatile Organic Compounds						
Acenaphthene	UG/KG	170 J	NA	260 J	NA	300 J
Acenaphthylene	UG/KG	500 U	NA	260 J	NA	120 J
Anthracene	UG/KG	180 J	NA	340 J	NA	210 J
Benzo(a)anthracene	UG/KG	410 J	NA	440 J	NA	410 J
Benzo(a)pyrene	UG/KG	500 U	NA	960 U	NA	490 U
Benzo(b)fluoranthene	UG/KG	270 J	NA	280 J	NA	200 J
Benzo(ghi)perylene	UG/KG	500 UJ,c	NA	960 UJ,c	NA	490 U
Benzo(k)fluoranthene	UG/KG	500 U	NA	200 J	NA	490 U
Chrysene	UG/KG	250 J,g	NA	450 J,g	NA	260 J,g
2,4-Dimethylphenol	UG/KG	500 U	NA	960 U	NA	120 J

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2B
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-4

Location ID		S04-4	S04-4	S04-5	S04-5	S04-6
Sample ID		S04-4	S04-4	S04-5	S04-5	S04-6
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-36.0	20.0-22.0	0.0-38.0	26.0-30.0	0.0-38.0
Date Sampled		02/27/95	02/27/95	02/27/95	02/27/95	02/27/95
Parameter	**Units**					
Semivolatile Organic Compounds						
bis(2-Ethylhexyl)phthalate	UG/KG	500 UJ,c	NA	960 UJ,c	NA	490 U
Fluoranthene	UG/KG	700	NA	1,100	NA	680
Fluorene	UG/KG	320 J	NA	480 J	NA	410 J
Indeno(1,2,3-cd)pyrene	UG/KG	500 U	NA	960 U	NA	490 UJ,c
3-Methylphenol & 4-Methylphenol	UG/KG	450 J	NA	240 J	NA	140 J
Naphthalene	UG/KG	7,200	NA	13,000	NA	7,200
Phenanthrene	UG/KG	880	NA	1,400	NA	1,200
Pyrene	UG/KG	580	NA	850 J	NA	650
Semivolatile Organic Compounds - SPLP						
2,4-Dimethylphenol -SPLP	MG/L	0.004 J	NA	0.005 J	NA	0.004 J
3-Methylphenol & 4-Methylphenol -SPLP	MG/L	0.01 U	NA	0.01 U	NA	0.002 J
Metals						
Antimony	MG/KG	45 U	NA	43.6 U	NA	44.3 U
Arsenic	MG/KG	29.6 J,c	NA	22.8 J,c	NA	29.5 J,c
Barium	MG/KG	49.2	NA	43.8	NA	48
Cadmium	MG/KG	16.7	NA	19.8	NA	15.1
Calcium	MG/KG	54,400	NA	77,600	NA	56,700
Chromium	MG/KG	121	NA	203	NA	115
Lead	MG/KG	1,250 J,m	NA	1,350 J,m	NA	1,230 J,m
Mercury	MG/KG	0.21	NA	0.15	NA	0.15
Nickel	MG/KG	61.3 J,m	NA	65.1 J,m	NA	63.7 J,m
Potassium	MG/KG	905	NA	727 U	NA	739 U
Selenium	MG/KG	3.8 UJ,m	NA	3.6 UJ,m	NA	3.7 UJ,m
Silver	MG/KG	7.5 UR,m	NA	7.3 UR,m	NA	7.4 UR,m

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2B
SUMMARY OF DETECTED ANALYTES IN SOIL TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-4

Location ID		S04-4	S04-4	S04-5	S04-5	S04-6
Sample ID		S04-4	S04-4	S04-5	S04-5	S04-6
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-36.0	20.0-22.0	0.0-38.0	26.0-30.0	0.0-38.0
Date Sampled		02/27/95	02/27/95	02/27/95	02/27/95	02/27/95
Parameter	**Units**					
Metals-SPLP						
Calcium -SPLP	MG/L	23.7	NA	26.1	NA	21.5
Lead -SPLP	MG/L	0.003 U	NA	0.003 U	NA	0.004
Potassium -SPLP	MG/L	5.6	NA	6.5	NA	9
Sodium -SPLP	MG/L	5 U	NA	5.5	NA	6.4
General Chemistry Parameters						
Chloride	MG/KG	73.7	NA	144	NA	105
Cyanide	MG/KG	15.6	NA	19.2	NA	23.4
PHSOL	S.U.	12.8 J,h	NA	11.8 J,h	NA	11.8 J,h
Sulfate	MG/KG	660	NA	262	NA	220
Total Organic Carbon	MG/KG	32,500	NA	35,900	NA	37,100
Total Organic Halogens	MG/KG	49.4 J,h	NA	74.8 J,h	NA	55.4 J,h
Total Recoverable Phenolics	MG/KG	0.38 U	NA	0.55	NA	0.37 U
Total Solids	PERCENT	NA	NA	NA	NA	NA
Miscellaneous - SPLP						
Cyanide -SPLP	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2B
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-4

Location ID		S04-6
Sample ID		S04-6
Matrix		Soil
Depth Interval (ft)		26.0-30.0
Date Sampled		02/27/95
Parameter	Units	
Volatile Organic Compounds		
Benzene	UG/KG	580 J
Ethylbenzene	UG/KG	910 U
Methyl ethyl ketone	UG/KG	9,100 U
Methylene chloride	UG/KG	1,800 U
Toluene	UG/KG	1,000
Xylenes, Total	UG/KG	2,800
Volatile Organic Compounds - SPLP		
Benzene -SPLP	MG/L	0.026
Methylene chloride -SPLP	MG/L	0.021
Toluene -SPLP	MG/L	0.028
1,1,1-Trichloroethane -SPLP	MG/L	0.005 U
Trichloroethene -SPLP	MG/L	0.002 J
Xylenes, Total -SPLP	MG/L	0.035
Semivolatile Organic Compounds		
Acenaphthene	UG/KG	NA
Acenaphthylene	UG/KG	NA
Anthracene	UG/KG	NA
Benzo(a)anthracene	UG/KG	NA
Benzo(a)pyrene	UG/KG	NA
Benzo(b)fluoranthene	UG/KG	NA
Benzo(ghi)perylene	UG/KG	NA
Benzo(k)fluoranthene	UG/KG	NA
Chrysene	UG/KG	NA
2,4-Dimethylphenol	UG/KG	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2B
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-4

Location ID		S04-6
Sample ID		S04-6
Matrix		Soil
Depth Interval (ft)		26.0-30.0
Date Sampled		02/27/95
Parameter	Units	
Semivolatile Organic Compounds		
bis(2-Ethylhexyl)phthalate	UG/KG	NA
Fluoranthene	UG/KG	NA
Fluorene	UG/KG	NA
Indeno(1,2,3-cd)pyrene	UG/KG	NA
3-Methylphenol & 4-Methylphenol	UG/KG	NA
Naphthalene	UG/KG	NA
Phenanthrene	UG/KG	NA
Pyrene	UG/KG	NA
Semivolatile Organic Compounds - SPLP		
2,4-Dimethylphenol -SPLP	MG/L	NA
3-Methylphenol & 4-Methylphenol -SPLP	MG/L	NA
Metals		
Antimony	MG/KG	NA
Arsenic	MG/KG	NA
Barium	MG/KG	NA
Cadmium	MG/KG	NA
Calcium	MG/KG	NA
Chromium	MG/KG	NA
Lead	MG/KG	NA
Mercury	MG/KG	NA
Nickel	MG/KG	NA
Potassium	MG/KG	NA
Selenium	MG/KG	NA
Silver	MG/KG	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2B
SUMMARY OF DETECTED ANALYTES IN SOIL TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-4

Location ID		**S04-6**
Sample ID		**S04-6**
Matrix		**Soil**
Depth Interval (ft)		**26.0-30.0**
Date Sampled		**02/27/95**
Parameter	**Units**	
Metals-SPLP		
Calcium -SPLP	MG/L	NA
Lead -SPLP	MG/L	NA
Potassium -SPLP	MG/L	NA
Sodium -SPLP	MG/L	NA
General Chemistry Parameters		
Chloride	MG/KG	NA
Cyanide	MG/KG	NA
PHSOL	S.U.	NA
Sulfate	MG/KG	NA
Total Organic Carbon	MG/KG	NA
Total Organic Halogens	MG/KG	NA
Total Recoverable Phenolics	MG/KG	NA
Total Solids	PERCENT	NA
Miscellaneous - SPLP		
Cyanide -SPLP	MG/L	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2C
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-5

Location ID		S05-1	S05-1	S05-1 (IIC)	S05-2	S05-2
Sample ID		S05-1	S05-1	S05-1 (IIC)	S05-2	S05-2
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-21.5	10.0-12.0	0.0-0.5	0.0-21.0	18.0-20.0
Date Sampled		06/06/94	06/06/94	02/09/95	06/06/94	06/06/94
Parameter	Units					
Volatile Organic Compounds						
Benzene	UG/KG	NA	700 U	5.3 U	NA	9,500
Carbon disulfide	UG/KG	NA	700 U	2.2 J	NA	680 U
Ethylbenzene	UG/KG	NA	700 U	5.3 U	NA	1,400
Methylene chloride	UG/KG	NA	1,400 U	11 U	NA	6,400
Toluene	UG/KG	NA	700 U	3.2 J	NA	12,000
Trichloroethene	UG/KG	NA	700 U	5.3 U	NA	3,000
Xylenes, Total	UG/KG	NA	700 U	5.3 U	NA	1,500
Volatile Organic Compounds - SPLP						
Benzene -SPLP	MG/L	NA	0.025 U	0.0050 U	NA	0.22
Methylene chloride -SPLP	MG/L	NA	0.050	0.042	NA	0.5
Toluene -SPLP	MG/L	NA	0.025 U	0.0032 J	NA	0.12
Trichloroethene -SPLP	MG/L	NA	0.025 U	0.0050 U	NA	0.32
Xylenes, Total -SPLP	MG/L	NA	0.025 U	0.0050 U	NA	0.77
Semivolatile Organic Compounds						
Acenaphthylene	UG/KG	37,000 U	NA	35,000 UJ,j	46,000 J	NA
Fluoranthene	UG/KG	37,000 U	NA	35,000 UJ,j	80,000 J	NA
Fluorene	UG/KG	37,000 U	NA	35,000 UJ,j	46,000 J	NA
3-Methylphenol & 4-Methylphenol	UG/KG	20,000	NA	35,000 UJ,j	180,000 U	NA
Naphthalene	UG/KG	59,000	NA	35,000 UJ,j	1,600,000	NA
Phenanthrene	UG/KG	37,000 U	NA	35,000 UJ,j	130,000 J	NA
Phenol	UG/KG	12,000 J	NA	35,000 UJ,j	180,000 U	NA
Pyrene	UG/KG	37,000 U	NA	35,000 UJ,j	64,000 J	NA
Semivolatile Organic Compounds - SPLP						
2,4-Dimethylphenol -SPLP	MG/L	0.016 J	NA	NA	0.099 J	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2C
SUMMARY OF DETECTED ANALYTES IN SOIL TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-5

Location ID		S05-1	S05-1	S05-1 (IIC)	S05-2	S05-2
Sample ID		S05-1	S05-1	S05-1 (IIC)	S05-2	S05-2
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-21.5	10.0-12.0	0.0-0.5	0.0-21.0	18.0-20.0
Date Sampled		06/06/94	06/06/94	02/09/95	06/06/94	06/06/94
Parameter	Units					
Semivolatile Organic Compounds - SPLP						
3-Methylphenol & 4-Methylphenol -SPLP	MG/L	0.020 U	NA	NA	0.59	NA
2-Methylphenol -SPLP	MG/L	0.020 U	NA	NA	0.14 J	NA
Naphthalene -SPLP	MG/L	0.020 U	NA	NA	1.8	NA
Pentachlorophenol -SPLP	MG/L	0.022 J,c	NA	NA	0.80 U	NA
Phenol -SPLP	MG/L	0.020 U	NA	NA	0.89	NA
Metals						
Antimony	MG/KG	16.2 J,m	NA	160 UJ,m	79.6 UJ,m	NA
Arsenic	MG/KG	10.2 J,k	NA	5.3 J,m	15.9 J,k	NA
Cadmium	MG/KG	13.6	NA	13.4 U	31.6	NA
Calcium	MG/KG	NA	NA	2,670 U	NA	NA
Chromium	MG/KG	49.3 J,k	NA	83.5 R,m	96.6 J,k	NA
Lead	MG/KG	66.4 J,m	NA	25.5 J,c	264 J,m	NA
Mercury	MG/KG	0.54	NA	0.11 U	0.27	NA
Nickel	MG/KG	63.3	NA	107 U	67.5	NA
Thallium	MG/KG	1.3 J,m	NA	1.1 UJ	2.6 J,m	NA
General Chemistry Parameters						
Chloride	MG/KG	NA	NA	6.2 J,e	NA	NA
PHSOL	S.U.	NA	NA	8.2 J,h	NA	NA
Total Organic Carbon	MG/KG	NA	NA	55,100	NA	NA
Total Organic Halogens	MG/KG	NA	NA	4	NA	NA
Miscellaneous - SPLP						
Cyanide -SPLP	MG/L	0.017	NA	NA	0.24	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2C
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-5

Location ID		S05-2 (IIC)
Sample ID		S05-2 (IIC)
Matrix		Soil
Depth Interval (ft)		0.0-0.5
Date Sampled		02/09/95
Parameter	**Units**	
Volatile Organic Compounds		
Benzene	UG/KG	5.9 U
Carbon disulfide	UG/KG	5.9 U
Ethylbenzene	UG/KG	5.9 U
Methylene chloride	UG/KG	2.4 J
Toluene	UG/KG	26
Trichloroethene	UG/KG	5.9 U
Xylenes, Total	UG/KG	5.9 U
Volatile Organic Compounds - SPLP		
Benzene -SPLP	MG/L	0.0050 U
Methylene chloride -SPLP	MG/L	0.010 U
Toluene -SPLP	MG/L	0.0049 J
Trichloroethene -SPLP	MG/L	0.0050 U
Xylenes, Total -SPLP	MG/L	0.0050 U
Semivolatile Organic Compounds		
Acenaphthylene	UG/KG	39,000 UJ,j
Fluoranthene	UG/KG	39,000 UJ,j
Fluorene	UG/KG	39,000 UJ,j
3-Methylphenol & 4-Methylphenol	UG/KG	39,000 UJ,j
Naphthalene	UG/KG	39,000 U
Phenanthrene	UG/KG	39,000 UJ,j
Phenol	UG/KG	39,000 UJ,j
Pyrene	UG/KG	39,000 UJ,j
Semivolatile Organic Compounds - SPLP		
2,4-Dimethylphenol -SPLP	MG/L	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2C
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-5

Location ID		S05-2 (IIC)
Sample ID		S05-2 (IIC)
Matrix		Soil
Depth Interval (ft)		0.0-0.5
Date Sampled		02/09/95
Parameter	Units	
Semivolatile Organic Compounds - SPLP		
3-Methylphenol & 4-Methylphenol -SPLP	MG/L	NA
2-Methylphenol -SPLP	MG/L	NA
Naphthalene -SPLP	MG/L	NA
Pentachlorophenol -SPLP	MG/L	NA
Phenol -SPLP	MG/L	NA
Metals		
Antimony	MG/KG	177 UJ,m
Arsenic	MG/KG	10 J,m
Cadmium	MG/KG	14.7 U
Calcium	MG/KG	11,300 R,m
Chromium	MG/KG	111 R,m
Lead	MG/KG	241 J,c
Mercury	MG/KG	0.12 U
Nickel	MG/KG	118 U
Thallium	MG/KG	1.2 UJ
General Chemistry Parameters		
Chloride	MG/KG	6.6 J,e
PHSOL	S.U.	8.3 J,h
Total Organic Carbon	MG/KG	81,300
Total Organic Halogens	MG/KG	27.4
Miscellaneous - SPLP		
Cyanide -SPLP	MG/L	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2D
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-6

Location ID		S06	S06	S06-1	S06-2	S06-3
Sample ID		S06	S06	S06-1	S06-2	S06-3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-33.7	14.0-16.0	0.0-0.5	0.0-0.5	0.0-24.8
Date Sampled		06/07/94	06/07/94	02/09/95	02/09/95	02/27/95
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/KG	NA	7.2 U	9.2 U	8.9 U	NA
1,1-Dichloroethane	UG/KG	NA	7.2 U	9.2 U	8.9 U	NA
Ethylbenzene	UG/KG	NA	7.2 U	9.2 U	8.9 U	NA
Methylene chloride	UG/KG	NA	14 U,z	18 U	18 U	NA
Toluene	UG/KG	NA	7.2 U	9.2 U	8.9 U	NA
Trichloroethene	UG/KG	NA	7.2 U	9.2 U	8.9 U	NA
Xylenes, Total	UG/KG	NA	7.2 U	9.2 U	8.9 U	NA
Volatile Organic Compounds - SPLP						
Benzene -SPLP	MG/L	NA	0.025 U	0.19 U	0.050 U	NA
1,1-Dichloroethane -SPLP	MG/L	NA	0.025 U	0.19 U	0.050 U	NA
Ethylbenzene -SPLP	MG/L	NA	0.025 U	0.19 U	0.050 U	NA
Methylene chloride -SPLP	MG/L	NA	0.060	0.38 U	0.039 J	NA
Toluene -SPLP	MG/L	NA	0.025 U	0.19 U	0.050 U	NA
Trichloroethene -SPLP	MG/L	NA	0.025 U	0.19 U	0.050 U	NA
Xylenes, Total -SPLP	MG/L	NA	0.025 U	0.19 U	0.050 U	NA
Semivolatile Organic Compounds						
Benzo(a)pyrene	UG/KG	940 U	NA	600 U	140 J	29,000 U
Benzo(b)fluoranthene	UG/KG	940 U	NA	130 J	300 J	29,000 U
Benzo(ghi)perylene	UG/KG	940 U	NA	600 U	120 J	29,000 U
Chrysene	UG/KG	270 J	NA	130 J	340 J	29,000 U
Fluoranthene	UG/KG	260 J	NA	130 J	130 J	29,000 U
Indeno(1,2,3-cd)pyrene	UG/KG	940 U	NA	600 U	150 J	29,000 UJ,c
Naphthalene	UG/KG	940 U	NA	600 U	590 U	350,000
Pyrene	UG/KG	250 J	NA	600 U	130 J	29,000 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2D
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-6

Location ID		S06	S06	S06-1	S06-2	S06-3
Sample ID		S06	S06	S06-1	S06-2	S06-3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-33.7	14.0-16.0	0.0-0.5	0.0-0.5	0.0-24.8
Date Sampled		06/07/94	06/07/94	02/09/95	02/09/95	02/27/95
Parameter	**Units**					
Semivolatile Organic Compounds - SPLP						
3-Methylphenol & 4-Methylphenol -SPLP	MG/L	0.020 U	NA	NA	NA	0.4
Naphthalene -SPLP	MG/L	0.0050 J	NA	NA	NA	5.6
Metals						
Antimony	MG/KG	85.3 U	NA	375 J,m	267 UJ,m	33.5 U
Arsenic	MG/KG	9.4 J,k	NA	16.9 J,m	21 J,m	22.1 J,c
Cadmium	MG/KG	37.1	NA	22.9 U	27 J,c	6.6
Calcium	MG/KG	NA	NA	60,600 R,m	76,000 R,m	843
Chromium	MG/KG	130 J,k	NA	151 R,m	365 R,m	88.5
Lead	MG/KG	589 J,m	NA	960 J,c	3,670 J,a	68.4 J,m
Nickel	MG/KG	56.9 U	NA	183 U	178 U	114 J,m
Thallium	MG/KG	5.9 J,m	NA	1.8 UJ,m	1.8 UJ,m	1.1 UJ
Metals-SPLP						
Arsenic -SPLP	MG/L	0.30 U	NA	NA	NA	0.011
Calcium -SPLP	MG/L	NA	NA	NA	NA	21.9
Lead -SPLP	MG/L	0.050 U	NA	NA	NA	0.019
General Chemistry Parameters						
Chloride	MG/KG	NA	NA	18.6 J,e	18.1 J,e	294
Cyanide	MG/KG	NA	NA	4.6 U	4.4 U	3
PHSOL	S.U.	NA	NA	14.5 J,h	14.3 J,h	8.5 J,h
Total Organic Carbon	MG/KG	NA	NA	5,660	12,000	47,400
Total Organic Halogens	MG/KG	NA	NA	3.3 U	3.0 U	211 J,h
Total Recoverable Phenolics	MG/KG	NA	NA	0.46 U	0.44 U	13.7
Miscellaneous - SPLP						
Cyanide -SPLP	MG/L	0.012	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2D
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-6

Location ID		S06-3
Sample ID		S06-3
Matrix		Soil
Depth Interval (ft)		12.0-14.0
Date Sampled		02/27/95
Parameter	**Units**	
Volatile Organic Compounds		
Benzene	UG/KG	680
1,1-Dichloroethane	UG/KG	36
Ethylbenzene	UG/KG	71
Methylene chloride	UG/KG	30 J
Toluene	UG/KG	590
Trichloroethene	UG/KG	25 J
Xylenes, Total	UG/KG	580
Volatile Organic Compounds - SPLP		
Benzene -SPLP	MG/L	0.42
1,1-Dichloroethane -SPLP	MG/L	0.006
Ethylbenzene -SPLP	MG/L	0.001 J
Methylene chloride -SPLP	MG/L	0.029
Toluene -SPLP	MG/L	0.03
Trichloroethene -SPLP	MG/L	0.002 J
Xylenes, Total -SPLP	MG/L	0.018
Semivolatile Organic Compounds		
Benzo(a)pyrene	UG/KG	NA
Benzo(b)fluoranthene	UG/KG	NA
Benzo(ghi)perylene	UG/KG	NA
Chrysene	UG/KG	NA
Fluoranthene	UG/KG	NA
Indeno(1,2,3-cd)pyrene	UG/KG	NA
Naphthalene	UG/KG	NA
Pyrene	UG/KG	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2D
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-6

Location ID		S06-3
Sample ID		S06-3
Matrix		Soil
Depth Interval (ft)		12.0-14.0
Date Sampled		02/27/95
Parameter	Units	
Semivolatile Organic Compounds - SPLP		
3-Methylphenol & 4-Methylphenol -SPLP	MG/L	NA
Naphthalene -SPLP	MG/L	NA
Metals		
Antimony	MG/KG	NA
Arsenic	MG/KG	NA
Cadmium	MG/KG	NA
Calcium	MG/KG	NA
Chromium	MG/KG	NA
Lead	MG/KG	NA
Nickel	MG/KG	NA
Thallium	MG/KG	NA
Metals-SPLP		
Arsenic -SPLP	MG/L	NA
Calcium -SPLP	MG/L	NA
Lead -SPLP	MG/L	NA
General Chemistry Parameters		
Chloride	MG/KG	NA
Cyanide	MG/KG	NA
PHSOL	S.U.	NA
Total Organic Carbon	MG/KG	NA
Total Organic Halogens	MG/KG	NA
Total Recoverable Phenolics	MG/KG	NA
Miscellaneous - SPLP		
Cyanide -SPLP	MG/L	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2E
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-7/S-20

Location ID		**S07**	**S07**	**S07**	**S07**	**S07-1**
Sample ID		**S07**	**S07**	**S07**	**S07**	**S07-1**
Matrix		**Soil**	**Soil**	**Soil**	**Soil**	**Soil**
Depth Interval (ft)		**0.0-30.0**	**22.0-24.0**	**30.0-41.5**	**32.0-34.0**	**0.0-30.0**
Date Sampled		**06/07/94**	**06/07/94**	**06/08/94**	**06/08/94**	**02/08/95**
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/KG	NA	12 J	NA	6.5 UJ,s	NA
Carbon disulfide	UG/KG	NA	15 U	NA	9.9 J,s	NA
Methyl ethyl ketone	UG/KG	NA	150 U	NA	65 UJ,s	NA
Methylene chloride	UG/KG	NA	31 U,z	NA	13 UJ,z	NA
Toluene	UG/KG	NA	46	NA	6.5 UJ,s	NA
Trichloroethene	UG/KG	NA	15 U	NA	6.5 UJ,s	NA
Xylenes, Total	UG/KG	NA	190	NA	6.5 UJ,s	NA
Volatile Organic Compounds - SPLP						
Methylene chloride -SPLP	MG/L	NA	0.040 J	NA	0.030 J	NA
Toluene -SPLP	MG/L	NA	0.020 J	NA	0.025 U	NA
Trichloroethene -SPLP	MG/L	NA	0.025 U	NA	0.020 J	NA
Xylenes, Total -SPLP	MG/L	NA	0.050	NA	0.025 U	NA
Semivolatile Organic Compounds						
Acenaphthene	UG/KG	1,900 U	NA	87 J	NA	950 UJ,g
Acenaphthylene	UG/KG	1,900 U	NA	150 J	NA	950 UJ,g
Anthracene	UG/KG	1,900 U	NA	320 J	NA	950 UJ,g
Benzo(a)anthracene	UG/KG	1,900 U	NA	740	NA	220 J,g
Benzo(a)pyrene	UG/KG	1,900 U	NA	490 J,c	NA	950 UJ,g
Benzo(b)fluoranthene	UG/KG	1,900 U	NA	570	NA	270 J,g
Benzo(ghi)perylene	UG/KG	1,900 U	NA	380 J,c	NA	950 UJ,g
Benzo(k)fluoranthene	UG/KG	1,900 U	NA	600	NA	950 UJ,g
Chrysene	UG/KG	1,900 U	NA	640	NA	390 J,g
bis(2-Ethylhexyl)phthalate	UG/KG	1,900 U	NA	190 J	NA	950 UJ,g
Fluoranthene	UG/KG	1,900 U	NA	1,600	NA	950 UJ,g

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2E
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-7/S-20

Location ID		S07	S07	S07	S07	S07-1
Sample ID		S07	S07	S07	S07	S07-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-30.0	22.0-24.0	30.0-41.5	32.0-34.0	0.0-30.0
Date Sampled		06/07/94	06/07/94	06/08/94	06/08/94	02/08/95
Parameter	**Units**					
Semivolatile Organic Compounds						
Fluorene	UG/KG	1,900 U	NA	360 J	NA	950 UJ,g
Indeno(1,2,3-cd)pyrene	UG/KG	1,900 U	NA	250 J	NA	950 UJ,g
Naphthalene	UG/KG	21,000	NA	5,200	NA	1,100
Phenanthrene	UG/KG	1,900 U	NA	1,300	NA	260 J,g
Pyrene	UG/KG	1,900 U	NA	1,100	NA	230 J,g
Semivolatile Organic Compounds - SPLP						
3-Methylphenol & 4-Methylphenol -SPLP	MG/L	0.040 U	NA	0.020 U	NA	0.014
Naphthalene -SPLP	MG/L	0.65	NA	0.020 U	NA	0.047
Metals						
Arsenic	MG/KG	8.7 J,k	NA	8.5 J,k	NA	15.3 J,m
Barium	MG/KG	29.2 U	NA	129	NA	28.9 U
Cadmium	MG/KG	37.7	NA	5.7	NA	18.0 U
Calcium	MG/KG	NA	NA	NA	NA	70,100 R,m
Chromium	MG/KG	127 J,k	NA	45.9 J,k	NA	170 R,m
Lead	MG/KG	859 J,m	NA	109 J,m	NA	675 J,k
Magnesium	MG/KG	NA	NA	NA	NA	NA
Mercury	MG/KG	0.15 U	NA	0.16	NA	0.14 U
Nickel	MG/KG	58.4 U	NA	16.6	NA	144 U
Potassium	MG/KG	NA	NA	NA	NA	722 U
Selenium	MG/KG	0.73 U	NA	0.39 U	NA	0.72 UJ
Silver	MG/KG	14.6 U	NA	0.013 U	NA	36.1 U
Sodium	MG/KG	NA	NA	NA	NA	722 U
Thallium	MG/KG	5.4 J,m	NA	4.3 J,m	NA	1.4 UJ

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2E
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-7/S-20

Location ID		S07	S07	S07	S07	S07-1
Sample ID		S07	S07	S07	S07	S07-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-30.0	22.0-24.0	30.0-41.5	32.0-34.0	0.0-30.0
Date Sampled		06/07/94	06/07/94	06/08/94	06/08/94	02/08/95
Parameter	Units					
Metals-SPLP						
Calcium -SPLP	MG/L	NA	NA	NA	NA	118
General Chemistry Parameters						
Alkalinity (Total)	MG/KG	NA	NA	NA	NA	NA
Chloride	MG/KG	NA	NA	NA	NA	169 J,c
Cyanide	MG/KG	1.2	NA	0.650	NA	3.6 U
Cyanide - Leachable	MG/L	0.013	NA	0.042	NA	NA
PHSOL	S.U.	NA	NA	NA	NA	11.1 J,h
Sulfate	MG/KG	NA	NA	NA	NA	224
Total Organic Carbon	MG/KG	NA	NA	NA	NA	5,970
Total Organic Halogens	MG/KG	NA	NA	NA	NA	82.8
Total Solids	PERCENT	68.5	65.2	77.1	65.2	NA
Miscellaneous - SPLP						
Cyanide -SPLP	MG/L	0.010 U	NA	0.11	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2E
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-7/S-20

Location ID		S07-1	S20A	S20B	S7A	S7B
Sample ID		S07-1	AMEC S20A	AMEC S20B	AMEC S7A	AMEC S7B
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		6.0-10.0	-	-	-	-
Date Sampled		02/08/95	06/07/01	06/07/01	06/07/01	06/07/01
Parameter	Units					
Volatile Organic Compounds						
Benzene	UG/KG	7.2 U	6.2 U	7 U	6.6 U	6.9 U
Carbon disulfide	UG/KG	7.2 U	NA	NA	NA	NA
Methyl ethyl ketone	UG/KG	13 J,c	NA	NA	NA	NA
Methylene chloride	UG/KG	6.6 J	6.2 U	7 U	6.6 U	6.9 U
Toluene	UG/KG	11	6.2 U	7 U	6.6 U	6.9 U
Trichloroethene	UG/KG	7.2 U	4.6 J	15	8.1	6.9 U
Xylenes, Total	UG/KG	7.2 U	19 U	21 U	20 U	21 U
Volatile Organic Compounds - SPLP						
Methylene chloride -SPLP	MG/L	NA	NA	NA	NA	NA
Toluene -SPLP	MG/L	NA	NA	NA	NA	NA
Trichloroethene -SPLP	MG/L	NA	NA	NA	NA	NA
Xylenes, Total -SPLP	MG/L	NA	NA	NA	NA	NA
Semivolatile Organic Compounds						
Acenaphthene	UG/KG	NA	NA	NA	NA	NA
Acenaphthylene	UG/KG	NA	410 U	460 U	440 U	460 U
Anthracene	UG/KG	NA	410 U	460 U	440 U	460 U
Benzo(a)anthracene	UG/KG	NA	410 UJ	460 UJ	440 U	460 U
Benzo(a)pyrene	UG/KG	NA	410 UJ	460 UJ	440 UJ	460 UJ
Benzo(b)fluoranthene	UG/KG	NA	NA	NA	NA	NA
Benzo(ghi)perylene	UG/KG	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	UG/KG	NA	NA	NA	NA	NA
Chrysene	UG/KG	NA	60 J	460 UJ	43 J	460 U
bis(2-Ethylhexyl)phthalate	UG/KG	NA	410 UJ	48 J	440 U	47 J
Fluoranthene	UG/KG	NA	50 J	460 U	73 J	83 J

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2E
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-7/S-20

Location ID		S07-1	S20A	S20B	S7A	S7B
Sample ID		S07-1	AMEC S20A	AMEC S20B	AMEC S7A	AMEC S7B
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		6.0-10.0	-	-	-	-
Date Sampled		02/08/95	06/07/01	06/07/01	06/07/01	06/07/01
Parameter	**Units**					
Semivolatile Organic Compounds						
Fluorene	UG/KG	NA	410 U	460 U	440 U	460 U
Indeno(1,2,3-cd)pyrene	UG/KG	NA	NA	NA	NA	NA
Naphthalene	UG/KG	NA	49 J	460 U	440 U	460 U
Phenanthrene	UG/KG	NA	410 U	460 U	440 U	54 J
Pyrene	UG/KG	NA	410 UJ	460 UJ	440 U	53 J
Semivolatile Organic Compounds - SPLP						
3-Methylphenol & 4-Methylphenol -SPLP	MG/L	NA	NA	NA	NA	NA
Naphthalene -SPLP	MG/L	NA	NA	NA	NA	NA
Metals						
Arsenic	MG/KG	NA	17.8	8.9	8.9	9.9
Barium	MG/KG	NA	20.5	70.6	63.6	66.3
Cadmium	MG/KG	NA	12.1 J	2.9 J	2.6 J	5.8 J
Calcium	MG/KG	NA	63,800	187,000	192,000	172,000
Chromium	MG/KG	NA	214	295	269	299
Lead	MG/KG	NA	968 J	29.8 J	35.5 J	50.5 J
Magnesium	MG/KG	NA	8,860 J	6,180 J	6,290 J	5,380 J
Mercury	MG/KG	NA	0.71	0.013 UJ	0.012 UJ	0.03 J
Nickel	MG/KG	NA	62.2 J	49.6 J	59.0 J	57.6 J
Potassium	MG/KG	NA	263	139	146	227
Selenium	MG/KG	NA	8.9	2.3 UJ	2.1 UJ	4.0
Silver	MG/KG	NA	1.6	0.12 UJ	0.11 UJ	0.16 UJ
Sodium	MG/KG	NA	273	74.4	135	189
Thallium	MG/KG	NA	7.2	4.0 U	3.8 U	4.0 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2E
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-7/S-20

Location ID		**S07-1**	**S20A**	**S20B**	**S7A**	**S7B**
Sample ID		**S07-1**	**AMEC S20A**	**AMEC S20B**	**AMEC S7A**	**AMEC S7B**
Matrix		**Soil**	**Soil**	**Soil**	**Soil**	**Soil**
Depth Interval (ft)		**6.0-10.0**	**-**	**-**	**-**	**-**
Date Sampled		**02/08/95**	**06/07/01**	**06/07/01**	**06/07/01**	**06/07/01**
Parameter	**Units**					
Metals-SPLP						
Calcium -SPLP	MG/L	NA	NA	NA	NA	NA
General Chemistry Parameters						
Alkalinity (Total)	MG/KG	NA	687	567	504	678
Chloride	MG/KG	NA	12.5 U	14.1 U	13.2 U	13.9 U
Cyanide	MG/KG	NA	0.78	1.5	1.3	1.4
Cyanide - Leachable	MG/L	NA	NA	NA	NA	NA
PHSOL	S.U.	NA	NA	NA	NA	NA
Sulfate	MG/KG	NA	40.1	22	36.4	20.4
Total Organic Carbon	MG/KG	NA	6,840	12,600	9,190	14,500
Total Organic Halogens	MG/KG	NA	249 U	282 U	264 U	278 U
Total Solids	PERCENT	NA	NA	NA	NA	NA
Miscellaneous - SPLP						
Cyanide -SPLP	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2F
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-27

Location ID		**S27**	**S27A**	**S27B**
Sample ID		**S27**	**AMEC 27A**	**AMEC 27B**
Matrix		**Soil**	**Soil**	**Soil**
Depth Interval (ft)		**0.0-2.0**	**-**	**-**
Date Sampled		**06/16/94**	**06/07/01**	**06/07/01**
Parameter	**Units**			
Volatile Organic Compounds				
Trichloroethene	UG/KG	5.8 UJ,i	7	5.9 U
Semivolatile Organic Compounds				
Acenaphthylene	UG/KG	7,700 U	2,300 J	250 J
Benzo(a)anthracene	UG/KG	3,200 J	5,200 J	280 J
Benzo(a)pyrene	UG/KG	7,700 U	14,000 J	380 J
Benzo(b)fluoranthene	UG/KG	2,000 J	NA	NA
Chrysene	UG/KG	7,700 UJ,g	7,100 J	320 J
Fluoranthene	UG/KG	7,700 UJ,g	4,800 J	480 J
Naphthalene	UG/KG	7,700 U	2,000 J	1,900 U
Pyrene	UG/KG	7,700 U	6,200 J	310 J
Metals				
Arsenic	MG/KG	22.8 J,k	22.9	16.7
Barium	MG/KG	42.2	30.5	28.1
Cadmium	MG/KG	24.4	13.6 J	9.8 J
Calcium	MG/KG	NA	16,400	31,100
Chromium	MG/KG	101	130	158
Lead	MG/KG	169	153	189
Magnesium	MG/KG	NA	2,110	5,240
Mercury	MG/KG	0.77	0.51 J	0.31 J
Nickel	MG/KG	94.5 J,k	101	71.4
Potassium	MG/KG	NA	185	198
Selenium	MG/KG	5.8 U	11.9	9.0
Silver	MG/KG	11.7 U	0.28 UJ	0.76
Sodium	MG/KG	NA	36.8	104

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 2F
SUMMARY OF DETECTED ANALYTES IN SOIL
TOTAL CONSTITUENT AND SPLP ANALYSIS
SWMU S-27

Location ID		S27	S27A	S27B
Sample ID		S27	AMEC 27A	AMEC 27B
Matrix		Soil	Soil	Soil
Depth Interval (ft)		0.0-2.0	-	-
Date Sampled		06/16/94	06/07/01	06/07/01
Parameter	**Units**			
General Chemistry Parameters				
Alkalinity (Total)	MG/KG	NA	248	373
Cyanide	MG/KG	7.4 J,m	5.4	5.4
Sulfate	MG/KG	NA	15.9	11.7 U
Total Organic Carbon	MG/KG	NA	37,300	31,700
Total Solids	PERCENT	85.5	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 3
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-1

Location ID			**S-1-1**	**S-1-1**	**S-1-2**	**S-1-2**	**S01-1**
Sample ID			**S-1-1**	**S-1-1**	**S-1-2**	**S-1-2**	**S01-1**
Matrix			**Soil**	**Soil**	**Soil**	**Soil**	**Soil**
Depth Interval (ft)			**0.0-24.0**	**6.0-8.0**	**0.0-8.0**	**4.0-6.0**	**0.0-0.5**
Date Sampled			**06/01/94**	**06/01/94**	**06/02/94**	**06/02/94**	**02/09/95**
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds - TCLP							
Benzene -TCLP	MG/L	0.5	NA	0.030	NA	0.025 U	0.037
Ethylbenzene -TCLP	MG/L	-	NA	0.025 U	NA	0.025 U	0.008
Methyl ethyl ketone -TCLP	MG/L	200	NA	0.25 U	NA	0.25 U	0.0032 J,c
Methylene chloride -TCLP	MG/L	-	NA	0.090	NA	0.11	0.051
Toluene -TCLP	MG/L	-	NA	0.010 J	NA	0.025 U	0.036
Xylenes, Total -TCLP	MG/L	-	NA	0.010 J	NA	0.025 U	0.043
Semivolatile Organic Compounds - TCLP							
Acenaphthene -TCLP	MG/L	-	0.080 U	NA	0.020 U	NA	0.052 J
Acenaphthylene -TCLP	MG/L	-	0.080 U	NA	0.020 U	NA	0.054 J
2,4-Dimethylphenol -TCLP	MG/L	-	0.12	NA	0.032	NA	0.56
Fluorene -TCLP	MG/L	-	0.080 U	NA	0.020 U	NA	0.09 J
3-Methylphenol & 4-Methylphenol -TCLP	MG/L	200	NA	NA	NA	NA	0.81
2-Methylphenol -TCLP	MG/L	200	0.052 J	NA	0.020 U	NA	0.46
Naphthalene -TCLP	MG/L	-	0.049 J	NA	0.020 U	NA	2.8
Phenanthrene -TCLP	MG/L	-	0.080 U	NA	0.020 U	NA	0.13 J
Phenol -TCLP	MG/L	-	0.93	NA	0.21	NA	0.2
Metals-TCLP							
Barium -TCLP	MG/L	100	0.28	NA	0.21	NA	0.20 U
Calcium -TCLP	MG/L	-	NA	NA	NA	NA	370
Lead -TCLP	MG/L	5	0.050 U	NA	0.050 U	NA	0.04
Nickel -TCLP	MG/L	-	0.22	NA	0.28	NA	0.051
Selenium -TCLP	MG/L	1	0.30 U	NA	0.060 U	NA	0.0054

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

J:\4200008B.15\DB\PROGRAM\Program md
Printed: 7/17/02 4:22:22 P
([LOCID] = 'S-1-1' OR [LOCID] = 'S-1-2' OR [LOCID] = 'S01-1' OR [LOCID] = 'S01-2') AND [PRCCODE] LIKE "*-TC

TABLE 3
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-1

Location ID			**S01-2**
Sample ID			**S01-2**
Matrix			**Soil**
Depth Interval (ft)			**0.0-0.5**
Date Sampled			**02/09/95**
Parameter	**Units**	**Criteria***	
Volatile Organic Compounds - TCLP			
Benzene -TCLP	MG/L	0.5	0.0050 U
Ethylbenzene -TCLP	MG/L	-	0.0050 U
Methyl ethyl ketone -TCLP	MG/L	200	0.0037 J
Methylene chloride -TCLP	MG/L	-	0.010 UJ
Toluene -TCLP	MG/L	-	0.0050 U
Xylenes, Total -TCLP	MG/L	-	0.0050 U
Semivolatile Organic Compounds - TCLP			
Acenaphthene -TCLP	MG/L	-	0.010 UJ,j
Acenaphthylene -TCLP	MG/L	-	0.010 UJ,j
2,4-Dimethylphenol -TCLP	MG/L	-	0.010 U
Fluorene -TCLP	MG/L	-	0.010 UJ,j
3-Methylphenol & 4-Methylphenol -TCLP	MG/L	200	0.005 J
2-Methylphenol -TCLP	MG/L	200	0.002 J
Naphthalene -TCLP	MG/L	-	0.010 U
Phenanthrene -TCLP	MG/L	-	0.010 UJ,j
Phenol -TCLP	MG/L	-	0.004 J
Metals-TCLP			
Barium -TCLP	MG/L	100	0.20 U
Calcium -TCLP	MG/L	-	21.7
Lead -TCLP	MG/L	5	0.029
Nickel -TCLP	MG/L	-	0.076
Selenium -TCLP	MG/L	1	0.0050 U

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 3A
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-2

Location ID			S02	S02	S02-1	S02-2	S02-3
Sample ID			S02	S02	S02-1	S02-2	S02-3
Matrix			Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)			0.0-26.0	12.0-14.0	0.0-0.5	0.0-0.5	0.0-27.3
Date Sampled			06/02/94	06/02/94	02/09/95	02/09/95	02/24/95
Parameter	Units	Criteria*					
Volatile Organic Compounds - TCLP							
Benzene -TCLP	MG/L	0.5	NA	0.025 U	0.025 U	0.0050 U	NA
Ethylbenzene -TCLP	MG/L	-	NA	0.025 U	0.025 U	0.0050 U	NA
Methyl ethyl ketone -TCLP	MG/L	200	NA	0.25 U	0.25 UJ,c	0.0024 J	NA
Methylene chloride -TCLP	MG/L	-	NA	0.074	0.050 U	0.010 UJ	NA
Toluene -TCLP	MG/L	-	NA	0.020 J	0.025 U	0.0050 U	NA
Semivolatile Organic Compounds - TCLP							
Di-n-butyl phthalate -TCLP	MG/L	-	0.020 U	NA	0.026	0.010 U	0.10 U
Naphthalene -TCLP	MG/L	-	0.020 U	NA	0.010 UJ	0.010 U	0.97
Metals-TCLP							
Barium -TCLP	MG/L	100	0.99	NA	0.20 U	0.32	0.24
Cadmium -TCLP	MG/L	1	0.025 U	NA	0.0050 U	0.012	0.0050 U
Calcium -TCLP	MG/L	-	NA	NA	667	683	576 J,k
Lead -TCLP	MG/L	5	2.0	NA	0.2	0.032	0.010 U
Nickel -TCLP	MG/L	-	0.28	NA	0.040 U	0.040 U	0.043
Selenium -TCLP	MG/L	1	1.5 U	NA	0.007	0.009	0.010 U

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

J:\4200008B.15\DB\PROGRAM\Program.md
Printed: 7/17/02 4:26:01 P
([LOCID] = 'S02' OR [LOCID] = 'S02-1' OR [LOCID] = 'S02-2' OR [LOCID] = 'S02-3') AND [PRCCODE] LIKE "*-TC

TABLE 3A
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-2

Location ID			S02-3
Sample ID			S02-3
Matrix			Soil
Depth Interval (ft)			16.0-18.0
Date Sampled			02/24/95
Parameter	**Units**	**Criteria***	
Volatile Organic Compounds - TCLP			
Benzene -TCLP	MG/L	0.5	0.11
Ethylbenzene -TCLP	MG/L	-	0.047
Methyl ethyl ketone -TCLP	MG/L	200	0.250 UR,c
Methylene chloride -TCLP	MG/L	-	0.050 UJ,c
Toluene -TCLP	MG/L	-	0.036 U,z
Semivolatile Organic Compounds - TCLP			
Di-n-butyl phthalate -TCLP	MG/L	-	NA
Naphthalene -TCLP	MG/L	-	NA
Metals-TCLP			
Barium -TCLP	MG/L	100	NA
Cadmium -TCLP	MG/L	1	NA
Calcium -TCLP	MG/L	-	NA
Lead -TCLP	MG/L	5	NA
Nickel -TCLP	MG/L	-	NA
Selenium -TCLP	MG/L	1	NA

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 3B
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-4

Location ID			S04-1	S04-2	S04-3	S04-4	S04-4
Sample ID			S04-1	S04-2	S04-3	S04-4	S04-4
Matrix			Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)			0.0-0.5	0.0-0.5	0.0-0.5	0.0-36.0	20.0-22.0
Date Sampled			02/10/95	02/10/95	02/10/95	02/27/95	02/27/95
Parameter	Units	Criteria*					
Volatile Organic Compounds - TCLP							
Benzene -TCLP	MG/L	0.5	NA	NA	NA	NA	0.005 UJ,z
Toluene -TCLP	MG/L	-	NA	NA	NA	NA	0.005 U
1,1,1-Trichloroethane -TCLP	MG/L	-	NA	NA	NA	NA	0.002 J
Xylenes, Total -TCLP	MG/L	-	NA	NA	NA	NA	0.005 U
Semivolatile Organic Compounds - TCLP							
Benzo(a)anthracene -TCLP	MG/L	-	NA	NA	NA	0.01 U	NA
Benzo(a)pyrene -TCLP	MG/L	-	NA	NA	NA	0.01 U	NA
Benzo(b)fluoranthene -TCLP	MG/L	-	NA	NA	NA	0.01 U	NA
Benzo(k)fluoranthene -TCLP	MG/L	-	NA	NA	NA	0.01 U	NA
Butyl benzyl phthalate -TCLP	MG/L	-	NA	NA	NA	0.01 U	NA
Chrysene -TCLP	MG/L	-	NA	NA	NA	0.01 U	NA
Di-n-octyl phthalate -TCLP	MG/L	-	NA	NA	NA	0.01 U	NA
2,4-Dimethylphenol -TCLP	MG/L	-	NA	NA	NA	0.006 J	NA
bis(2-Ethylhexyl)phthalate -TCLP	MG/L	-	NA	NA	NA	0.01 U	NA
3-Methylphenol & 4-Methylphenol -TCLP	MG/L	200	NA	NA	NA	0.007 J	NA
2-Methylphenol -TCLP	MG/L	200	NA	NA	NA	0.003 J	NA
Naphthalene -TCLP	MG/L	-	NA	NA	NA	0.1	NA
Phenanthrene -TCLP	MG/L	-	NA	NA	NA	0.002 J	NA
Metals-TCLP							
Barium -TCLP	MG/L	100	0.48	0.56	0.58	0.29	NA
Calcium -TCLP	MG/L	-	1,980	1,990	2,150	662	NA
Lead -TCLP	MG/L	5	0.0030 UJ,c	0.060 UJ,c	0.060 UJ,c	0.003 U	NA
Nickel -TCLP	MG/L	-	0.40 U	0.40 U	0.40 U	0.95	NA

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 3B
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-4

Location ID			S04-1	S04-2	S04-3	S04-4	S04-4
Sample ID			S04-1	S04-2	S04-3	S04-4	S04-4
Matrix			Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)			0.0-0.5	0.0-0.5	0.0-0.5	0.0-36.0	20.0-22.0
Date Sampled			02/10/95	02/10/95	02/10/95	02/27/95	02/27/95
Parameter	Units	Criteria*					
Metals-TCLP							
Potassium -TCLP	MG/L	-	13	5.2	6	11	NA

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

([LOCID] = 'S04' OR [LOCID] = 'S04-1' OR [LOCID] ='S04-2' OR [LOCID] = 'S04-3' OR [LOCID] = 'S04-4' OR [LOCID] = 'S04-5' OR [LOCID] = 'S04-6') AND ([PRCCODE] LIKE "-TC'

TABLE 3B
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-4

Location ID			S04-5	S04-5	S04-6	S04-6
Sample ID			S04-5	S04-5	S04-6	S04-6
Matrix			Soil	Soil	Soil	Soil
Depth Interval (ft)			0.0-38.0	26.0-30.0	0.0-38.0	26.0-30.0
Date Sampled			02/27/95	02/27/95	02/27/95	02/27/95
Parameter	Units	Criteria*				
Volatile Organic Compounds - TCLP						
Benzene -TCLP	MG/L	0.5	NA	0.022	NA	0.022
Toluene -TCLP	MG/L	-	NA	0.031	NA	0.036
1,1,1-Trichloroethane -TCLP	MG/L	-	NA	0.005 U	NA	0.005 U
Xylenes, Total -TCLP	MG/L	-	NA	0.043	NA	0.052
Semivolatile Organic Compounds - TCLP						
Benzo(a)anthracene -TCLP	MG/L	-	0.02 U	NA	0.011 J	NA
Benzo(a)pyrene -TCLP	MG/L	-	0.02 U	NA	0.011 J	NA
Benzo(b)fluoranthene -TCLP	MG/L	-	0.02 U	NA	0.015 J	NA
Benzo(k)fluoranthene -TCLP	MG/L	-	0.02 U	NA	0.019 J	NA
Butyl benzyl phthalate -TCLP	MG/L	-	0.02 U	NA	0.008 J	NA
Chrysene -TCLP	MG/L	-	0.02 U	NA	0.014 J	NA
Di-n-octyl phthalate -TCLP	MG/L	-	0.02 U	NA	0.015 J	NA
2,4-Dimethylphenol -TCLP	MG/L	-	0.02 U	NA	0.04 U	NA
bis(2-Ethylhexyl)phthalate -TCLP	MG/L	-	0.02 U	NA	0.023 J	NA
3-Methylphenol & 4-Methylphenol -TCLP	MG/L	200	0.02 U	NA	0.04 U	NA
2-Methylphenol -TCLP	MG/L	200	0.02 U	NA	0.04 U	NA
Naphthalene -TCLP	MG/L	-	0.34 E	NA	0.5	NA
Phenanthrene -TCLP	MG/L	-	0.02 U	NA	0.04 U	NA
Metals-TCLP						
Barium -TCLP	MG/L	100	0.26	NA	0.29	NA
Calcium -TCLP	MG/L	-	632	NA	657	NA
Lead -TCLP	MG/L	5	0.007	NA	0.003 U	NA
Nickel -TCLP	MG/L	-	0.11	NA	0.14	NA

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 3B
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-4

Location ID			S04-5	S04-5	S04-6	S04-6
Sample ID			S04-5	S04-5	S04-6	S04-6
Matrix			Soil	Soil	Soil	Soil
Depth Interval (ft)			0.0-38.0	26.0-30.0	0.0-38.0	26.0-30.0
Date Sampled			02/27/95	02/27/95	02/27/95	02/27/95
Parameter	Units	Criteria*				
Metals-TCLP						
Potassium -TCLP	MG/L	-	8.9	NA	11.6	NA

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 3C
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-5

Location ID			S05-1	S05-1	S05-1 (IIC)	S05-2	S05-2
Sample ID			S05-1	S05-1	S05-1 (IIC)	S05-2	S05-2
Matrix			Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)			0.0-21.5	10.0-12.0	0.0-0.5	0.0-21.0	18.0-20.0
Date Sampled			06/06/94	06/06/94	02/09/95	06/06/94	06/06/94
Parameter	Units	Criteria*					
Volatile Organic Compounds - TCLP							
Benzene -TCLP	MG/L	0.5	NA	0.025 U	0.0050 U	NA	0.26
Ethylbenzene -TCLP	MG/L	-	NA	0.025 U	0.0050 U	NA	0.010 J
Methylene chloride -TCLP	MG/L	-	NA	0.050	0.010 UJ	NA	0.5
Toluene -TCLP	MG/L	-	NA	0.010 J	0.0050 U	NA	0.16
Trichloroethene -TCLP	MG/L	0.5	NA	0.025 U	0.0050 U	NA	0.370
Xylenes, Total -TCLP	MG/L	-	NA	0.025 U	0.0050 U	NA	0.12
Semivolatile Organic Compounds - TCLP							
Acenaphthylene -TCLP	MG/L	-	0.10 U	NA	0.010 U	0.021 J	NA
2,4-Dimethylphenol -TCLP	MG/L	-	0.066 J	NA	0.010 U	0.085 J	NA
3-Methylphenol & 4-Methylphenol -TCLP	MG/L	200	0.92	NA	0.010 U	0.47	NA
2-Methylphenol -TCLP	MG/L	200	0.10 U	NA	0.010 U	0.12	NA
Naphthalene -TCLP	MG/L	-	0.063 J	NA	0.010 U	1.2	NA
Phenol -TCLP	MG/L	-	0.25	NA	0.010 U	0.69	NA
Metals-TCLP							
Arsenic -TCLP	MG/L	5	0.30 U	NA	0.018	0.30 U	NA
Barium -TCLP	MG/L	100	0.20 U	NA	0.20 U	0.22	NA
Calcium -TCLP	MG/L	-	NA	NA	40.2	NA	NA
Lead -TCLP	MG/L	5	0.083	NA	0.11	0.050 U	NA
Nickel -TCLP	MG/L	-	0.56	NA	0.22	0.46	NA
Selenium -TCLP	MG/L	1	0.30 U	NA	0.0054	0.30 U	NA

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 3C
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-5

Location ID			S05-2 (IIC)
Sample ID			S05-2 (IIC)
Matrix			Soil
Depth Interval (ft)			0.0-0.5
Date Sampled			02/09/95
Parameter	Units	Criteria*	
Volatile Organic Compounds - TCLP			
Benzene -TCLP	MG/L	0.5	0.0050 U
Ethylbenzene -TCLP	MG/L	-	0.0050 U
Methylene chloride -TCLP	MG/L	-	0.010 UJ
Toluene -TCLP	MG/L	-	0.0044 J
Trichloroethene -TCLP	MG/L	0.5	0.0050 U
Xylenes, Total -TCLP	MG/L	-	0.0050 U
Semivolatile Organic Compounds - TCLP			
Acenaphthylene -TCLP	MG/L	-	0.011 U
2,4-Dimethylphenol -TCLP	MG/L	-	0.011 U
3-Methylphenol & 4-Methylphenol -TCLP	MG/L	200	0.011 U
2-Methylphenol -TCLP	MG/L	200	0.011 U
Naphthalene -TCLP	MG/L	-	0.011 U
Phenol -TCLP	MG/L	-	0.011 U
Metals-TCLP			
Arsenic -TCLP	MG/L	5	0.016
Barium -TCLP	MG/L	100	0.20 U
Calcium -TCLP	MG/L	-	60.5
Lead -TCLP	MG/L	5	0.38
Nickel -TCLP	MG/L	-	0.19
Selenium -TCLP	MG/L	1	0.0050 U

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 3D
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-6

Location ID			S06	S06	S06-1	S06-2	S06-3
Sample ID			S06	S06	S06-1	S06-2	S06-3
Matrix			Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)			0.0-33.7	14.0-16.0	0.0-0.5	0.0-0.5	0.0-24.8
Date Sampled			06/07/94	06/07/94	02/09/95	02/09/95	02/27/95
Parameter	Units	Criteria*					
Volatile Organic Compounds - TCLP							
Benzene -TCLP	MG/L	0.5	NA	0.025 U	0.0050 U	0.0050 U	NA
1,1-Dichloroethane -TCLP	MG/L	-	NA	0.025 U	0.0050 U	0.0050 U	NA
Ethylbenzene -TCLP	MG/L	-	NA	0.025 U	0.0050 U	0.0050 U	NA
Methylene chloride -TCLP	MG/L	-	NA	0.070	0.010 UJ	0.010 UJ	NA
Toluene -TCLP	MG/L	-	NA	0.025 U	0.0050 U	0.0050 U	NA
Trichloroethene -TCLP	MG/L	0.5	NA	0.025 U	0.0050 U	0.0050 U	NA
Xylenes, Total -TCLP	MG/L	-	NA	0.025 U	0.0050 U	0.0050 U	NA
Semivolatile Organic Compounds - TCLP							
2,4-Dimethylphenol -TCLP	MG/L	-	0.020 U	NA	0.010 U	0.010 U	0.042 J
3-Methylphenol & 4-Methylphenol -TCLP	MG/L	200	0.020 U	NA	0.010 U	0.010 U	0.62
Naphthalene -TCLP	MG/L	-	0.0050 J	NA	0.010 U	0.010 U	0.77
Phenol -TCLP	MG/L	-	0.020 U	NA	0.010 U	0.010 U	0.27
Metals-TCLP							
Arsenic -TCLP	MG/L	5	0.20 U	NA	0.010 U	0.010 U	0.034
Cadmium -TCLP	MG/L	1	0.0050 U	NA	0.0050 U	0.013	0.005 U
Calcium -TCLP	MG/L	-	NA	NA	653	638	66.4
Chromium -TCLP	MG/L	5	0.011	NA	0.010 U	0.010 U	0.01 U
Lead -TCLP	MG/L	5	0.050 U	NA	0.0030 U	0.14	0.12
Nickel -TCLP	MG/L	-	0.040 U	NA	0.040 U	0.040 U	0.45
Selenium -TCLP	MG/L	1	0.30 U	NA	0.006	0.009	0.005 U

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 3D
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-6

Location ID			S06-3
Sample ID			S06-3
Matrix			Soil
Depth Interval (ft)			12.0-14.0
Date Sampled			02/27/95
Parameter	**Units**	**Criteria***	
Volatile Organic Compounds - TCLP			
Benzene -TCLP	MG/L	0.5	0.048
1,1-Dichloroethane -TCLP	MG/L	-	0.004 J
Ethylbenzene -TCLP	MG/L	-	0.002 J
Methylene chloride -TCLP	MG/L	-	0.003 J
Toluene -TCLP	MG/L	-	0.31
Trichloroethene -TCLP	MG/L	0.5	0.001 J
Xylenes, Total -TCLP	MG/L	-	0.022
Semivolatile Organic Compounds - TCLP			
2,4-Dimethylphenol -TCLP	MG/L	-	NA
3-Methylphenol & 4-Methylphenol -TCLP	MG/L	200	NA
Naphthalene -TCLP	MG/L	-	NA
Phenol -TCLP	MG/L	-	NA
Metals-TCLP			
Arsenic -TCLP	MG/L	5	NA
Cadmium -TCLP	MG/L	1	NA
Calcium -TCLP	MG/L	-	NA
Chromium -TCLP	MG/L	5	NA
Lead -TCLP	MG/L	5	NA
Nickel -TCLP	MG/L	-	NA
Selenium -TCLP	MG/L	1	NA

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

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([LOCID] = 'S06' OR [LOCID] = 'S06-1' OR [LOCID] = 'S06-2' OR [LOCID] = 'S06-3') AND ([PRCCODE] LIKE "*-TC')

TABLE 3E
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-7/S-20

Location ID			S07	S07	S07	S07	S07-1
Sample ID			S07	S07	S07	S07	S07-1
Matrix			Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)			0.0-30.0	22.0-24.0	30.0-41.5	32.0-34.0	0.0-30.0
Date Sampled			06/07/94	06/07/94	06/08/94	06/08/94	02/08/95
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds - TCLP							
Methylene chloride -TCLP	MG/L	-	NA	0.070	NA	0.030	NA
1,1,2,2-Tetrachloroethane -TCLP	MG/L	-	NA	0.025 U	NA	0.010 J	NA
Toluene -TCLP	MG/L	-	NA	0.010 J	NA	0.025 U	NA
Xylenes, Total -TCLP	MG/L	-	NA	0.030	NA	0.025 U	NA
Semivolatile Organic Compounds - TCLP							
2,4-Dimethylphenol -TCLP	MG/L	-	0.040 U	NA	0.020 U	NA	0.003 J
3-Methylphenol & 4-Methylphenol -TCLP	MG/L	200	0.040 U	NA	0.020 U	NA	0.026
Naphthalene -TCLP	MG/L	-	0.69	NA	0.019 J	NA	0.043
Metals-TCLP							
Barium -TCLP	MG/L	100	0.34	NA	0.62	NA	0.20 U
Calcium -TCLP	MG/L	-	NA	NA	NA	NA	629 J,a
Nickel -TCLP	MG/L	-	0.26	NA	0.040 U	NA	0.040 U

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 3F
SUMMARY OF DETECTED ANALYTES IN SOIL
TCLP ANALYSIS
SWMU S-27

Location ID			S27
Sample ID			S27
Matrix			Soil
Depth Interval (ft)			0.0-2.0
Date Sampled			06/16/94
Parameter	**Units**	**Criteria***	
Volatile Organic Compounds - TCLP			
Benzene -TCLP	MG/L	0.5	0.020 J
Metals-TCLP			
Nickel -TCLP	MG/L	-	0.23

*Criteria- TCLP Action Levels: Federal Register, Vol. 55, No. 61 No. 126.

Flags assigned during chemistry validation are shown.

⬭ Concentration Exceeds Criteria.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12A	MWS-12A	MWS-12A	MWS-12A	MWS-12A
Sample ID		MWS-12A	MWS-12A	MWS-12A	MWS-12A	MWS-12A
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/25/91	04/17/91	07/16/91	10/15/91	01/30/92
Parameter	Units					
Volatile Organic Compounds						
Benzene	UG/L	96	190	130	100 J	120
1,1-Dichloroethane	UG/L	5.2	NA	NA	NA	7.7
Methylene chloride	UG/L	21	NA	NA	NA	18
Toluene	UG/L	4.1 J	NA	NA	NA	3.5 J
Semivolatile Organic Compounds						
Acenaphthylene	UG/L	50 U	NA	NA	NA	10 U
Anthracene	UG/L	50 U	NA	NA	NA	10 U
2,4-Dimethylphenol	UG/L	50 U	NA	NA	NA	10 U
bis(2-Ethylhexyl)phthalate	UG/L	50 U	NA	NA	NA	10 U
Fluoranthene	UG/L	50 U	NA	NA	NA	10 U
Fluorene	UG/L	50 U	NA	NA	NA	5.3 J
3-Methylphenol & 4-Methylphenol	UG/L	NA	NA	NA	NA	10 U
2-Methylphenol	UG/L	50 U	NA	NA	NA	10 U
4-Methylphenol	UG/L	50 U	NA	NA	NA	NA
Naphthalene	UG/L	50 U	19	22	18 J	18
Phenanthrene	UG/L	50 U	NA	NA	NA	9 J
Phenol	UG/L	50 U	NA	NA	NA	36
Pyrene	UG/L	50 U	NA	NA	NA	10 U
Pyridine	UG/L	50 UJ	NA	NA	NA	10 U
Metals						
Antimony	UG/L	NA	NA	NA	NA	NA
Arsenic	UG/L	NA	NA	NA	NA	NA
Barium	UG/L	NA	NA	NA	NA	NA
Cadmium	UG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12A	MWS-12A	MWS-12A	MWS-12A	MWS-12A
Sample ID		MWS-12A	MWS-12A	MWS-12A	MWS-12A	MWS-12A
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/25/91	04/17/91	07/16/91	10/15/91	01/30/92
Parameter	Units					
Metals						
Calcium	UG/L	NA	NA	NA	NA	NA
Chromium	UG/L	NA	NA	NA	NA	NA
Iron	UG/L	NA	NA	NA	NA	NA
Lead	UG/L	NA	NA	NA	NA	NA
Magnesium	UG/L	NA	NA	NA	NA	NA
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	NA	NA	NA	NA	NA
Potassium	UG/L	NA	NA	NA	NA	NA
Selenium	UG/L	NA	NA	NA	NA	NA
Sodium	UG/L	NA	NA	NA	NA	NA
Thallium	UG/L	NA	NA	NA	NA	NA
Dissolved Metals						
Arsenic -DISS	UG/L	10 U	NA	NA	NA	10 U
Barium -DISS	UG/L	410	NA	NA	NA	200 UJ,m
Cadmium -DISS	UG/L	5 U	NA	NA	NA	5 U
Calcium -DISS	UG/L	140,000	160,000	150,000	160,000	124,000
Iron -DISS	UG/L	NA	NA	NA	NA	NA
Magnesium -DISS	UG/L	NA	NA	NA	NA	NA
Manganese -DISS	UG/L	NA	NA	NA	NA	NA
Mercury -DISS	UG/L	0.2 U	NA	NA	NA	0.2
Nickel -DISS	UG/L	40 U	NA	NA	NA	40 U
Potassium -DISS	UG/L	NA	250,000	260,000	240,000	213,000
Selenium -DISS	UG/L	25 UJ	NA	NA	NA	58.8 R
Sodium -DISS	UG/L	250,000	250,000	240,000	230,000	218,000

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12A	MWS-12A	MWS-12A	MWS-12A	MWS-12A
Sample ID		MWS-12A	MWS-12A	MWS-12A	MWS-12A	MWS-12A
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/25/91	04/17/91	07/16/91	10/15/91	01/30/92
Parameter	**Units**					
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	520	650	550	640	590
Alkalinity (Total)	MG/L	NA	NA	NA	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	NA	410	NA	460	360
Chloride	MG/L	660 J	780	630	620	630
Cyanide	MG/L	0.010 UJ	NA	NA	NA	0.010 U
Dissolved Oxygen	MG/L	NA	NA	NA	NA	NA
Field pH	S.U.	12.74	12.5	11.45	12.2	12.3
Nitrate Nitrogen	MG/L	NA	NA	NA	NA	NA
pH Liquid	S.U.	12	NA	NA	NA	NA
Sulfate	MG/L	120	120	130	130	150
Total Organic Carbon	MG/L	12	11.6	12 J	11	9.4
Total Dissolved Solids	MG/L	1,600	1,700	1,700 J	1,500	1,500
Total Organic Halogens	MG/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Total Recoverable Phenolics	MG/L	0.02	0.13 J	0.088 J	0.1	0.074
Turbidity	NTU	NA	NA	NA	NA	NA
Redox Potential	Millivolts	NA	NA	NA	NA	NA
Temperature	DEG C	9.8	12.1	17.2	11.7	11.0
Specific Conductance	UMHOS/CM	NA	NA	NA	NA	NA
Dissolved Gases						
Methane	MG/L	NA	NA	NA	NA	NA
Nitrogen	MG/L	NA	NA	NA	NA	NA
Oxygen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12A	MWS-12A	MWS-12A	MWS-12B	MWS-12B
Sample ID		MWS-12A	MWS-12A	MWS-12A	MWS-12B	MWS-12B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/08/92	05/13/97	11/04/99	01/25/91	04/17/91
Parameter	Units					
Volatile Organic Compounds						
Benzene	UG/L	110	92	55	190	310
1,1-Dichloroethane	UG/L	4.7 J	4.6 J	3.3 J	10 U	NA
Methylene chloride	UG/L	3.7 J	5.0 U	5.0 U	20 U	NA
Toluene	UG/L	3.2 J	2.1 J	1.5 J	10 U	NA
Semivolatile Organic Compounds						
Acenaphthylene	UG/L	2.0 J	1.4 J	1.6 J	50 U	NA
Anthracene	UG/L	10 U	12	1.6 J	50 U	NA
2,4-Dimethylphenol	UG/L	2.0 J	10 U	10 U	50 U	NA
bis(2-Ethylhexyl)phthalate	UG/L	3.0 J	10 U	10 U	50 U	NA
Fluoranthene	UG/L	2.0 J	10 UJ,d	2.4 J	50 U	NA
Fluorene	UG/L	6.0 J	5.6 J,cm	6.1 J	50 U	NA
3-Methylphenol & 4-Methylphenol	UG/L	NA	4.2 J,cl	5.0 J	NA	NA
2-Methylphenol	UG/L	2.0 J	1.4 J,c	10 U	50 U	NA
4-Methylphenol	UG/L	6.0 J,Q	NA	NA	50 U	NA
Naphthalene	UG/L	29	21 J,c	26	110	220
Phenanthrene	UG/L	12	11 J,l	9.4 J	50 U	NA
Phenol	UG/L	62	19	18	170	NA
Pyrene	UG/L	1.0 J	10 U	1.2 J	50 U	NA
Pyridine	UG/L	10 U	20 UR,l	4.9 J	50 UJ	NA
Metals						
Antimony	UG/L	NA	NA	2.2 BJ	NA	NA
Arsenic	UG/L	NA	NA	10.0 U	NA	NA
Barium	UG/L	NA	NA	130 B	NA	NA
Cadmium	UG/L	NA	NA	0.33 B	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12A	MWS-12A	MWS-12A	MWS-12B	MWS-12B
Sample ID		MWS-12A	MWS-12A	MWS-12A	MWS-12B	MWS-12B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/08/92	05/13/97	11/04/99	01/25/91	04/17/91
Parameter	**Units**					
Metals						
Calcium	UG/L	NA	NA	132,000 J	NA	NA
Chromium	UG/L	NA	NA	3.3 B	NA	NA
Iron	UG/L	NA	199	102 J	NA	NA
Lead	UG/L	NA	NA	1.3 B	NA	NA
Magnesium	UG/L	NA	NA	32.2 B	NA	NA
Manganese	UG/L	NA	10.7	NA	NA	NA
Mercury	UG/L	NA	NA	0.083 B	NA	NA
Potassium	UG/L	NA	NA	320,000	NA	NA
Selenium	UG/L	NA	NA	17.3	NA	NA
Sodium	UG/L	NA	NA	160,000	NA	NA
Thallium	UG/L	NA	NA	10 U	NA	NA
Dissolved Metals						
Arsenic -DISS	UG/L	10 U	NA	2.5 B	24	NA
Barium -DISS	UG/L	200 U	NA	102 B	790	NA
Cadmium -DISS	UG/L	5 U	NA	0.26 B	5 U	NA
Calcium -DISS	UG/L	120,000	NA	147,000 J	800,000	3,000,000
Iron -DISS	UG/L	NA	23.5	115 J	NA	NA
Magnesium -DISS	UG/L	NA	NA	55.8 B	NA	NA
Manganese -DISS	UG/L	NA	1.8	NA	NA	NA
Mercury -DISS	UG/L	0.39	NA	0.089 B	0.2 U	NA
Nickel -DISS	UG/L	40 U	NA	40 U	40 U	NA
Potassium -DISS	UG/L	240,000	NA	326,000	NA	480,000
Selenium -DISS	UG/L	25 UJ,m	NA	14.0	50 UJ	NA
Sodium -DISS	UG/L	190,000	NA	165,000	180,000	160,000

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12A	MWS-12A	MWS-12A	MWS-12B	MWS-12B
Sample ID		MWS-12A	MWS-12A	MWS-12A	MWS-12B	MWS-12B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/08/92	05/13/97	11/04/99	01/25/91	04/17/91
Parameter	Units					
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	550	NA	366	500	520
Alkalinity (Total)	MG/L	NA	NA	450 J	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	330	480	NA	NA	340
Chloride	MG/L	680	670	654	3,700 J	4,800
Cyanide	MG/L	0.44	NA	0.062	0.010 UJ	NA
Dissolved Oxygen	MG/L	NA	0.16	0.3	NA	NA
Field pH	S.U.	10.21	10.98	12.06	11.96	10.5
Nitrate Nitrogen	MG/L	NA	NA	0.10 U	NA	NA
pH Liquid	S.U.	NA	NA	NA	11	NA
Sulfate	MG/L	230 J,m	210	229	190	200
Total Organic Carbon	MG/L	12	NA	10.1 J	37	40
Total Dissolved Solids	MG/L	1,500	NA	1,450	7,200	7,600
Total Organic Halogens	MG/L	0.050 UJ,h	NA	0.019 BJ	0.15	0.064
Total Recoverable Phenolics	MG/L	0.19	NA	0.052	0.04	0.35 J
Turbidity	NTU	NA	5.29	190	NA	NA
Redox Potential	Millivolts	NA	-221.6	-511	NA	NA
Temperature	DEG C	8.33	13.12	13.3	8.7	11.7
Specific Conductance	UMHOS/CM	NA	2,530	3,500	NA	NA
Dissolved Gases						
Methane	MG/L	NA	5.98	4.7	NA	NA
Nitrogen	MG/L	NA	12.3	15.9	NA	NA
Oxygen	MG/L	NA	0.53	0.53	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12B	MWS-12B	MWS-12B	MWS-12B	MWS-12B
Sample ID		MWS-12B	MWS-12B	MWS-12B	MWS-12B	MWS-12B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		07/16/91	10/15/91	01/30/92	12/09/92	05/13/97
Parameter	Units					
Volatile Organic Compounds						
Benzene	UG/L	180	180 J	220	240	49
1,1-Dichloroethane	UG/L	NA	NA	10 U	12 U	5.0 U
Methylene chloride	UG/L	NA	NA	20 U	25 U	5.0 U
Toluene	UG/L	NA	NA	6.6 J	12 U	2.5 J
Semivolatile Organic Compounds						
Acenaphthylene	UG/L	NA	NA	10 U	10 U	11 U
Anthracene	UG/L	NA	NA	10 U	10 U	11 U
2,4-Dimethylphenol	UG/L	NA	NA	5.3 J	7.0 J	8.0 J
bis(2-Ethylhexyl)phthalate	UG/L	NA	NA	10 U	10 U	11 U
Fluoranthene	UG/L	NA	NA	10 U	10 U	11 U
Fluorene	UG/L	NA	NA	10 U	10 U	2.2 J,c
3-Methylphenol & 4-Methylphenol	UG/L	NA	NA	18	NA	17 J,cl
2-Methylphenol	UG/L	NA	NA	6.1 J	12	4.9 J,c
4-Methylphenol	UG/L	NA	NA	NA	10 U	NA
Naphthalene	UG/L	120	10 U	140	200	52 J,c
Phenanthrene	UG/L	NA	NA	10 U	10 U	2.3 J,l
Phenol	UG/L	NA	NA	150	200	84
Pyrene	UG/L	NA	NA	10 U	10 U	11 U
Pyridine	UG/L	NA	NA	10 U	10 U	22 UR,l
Metals						
Antimony	UG/L	NA	NA	NA	NA	NA
Arsenic	UG/L	NA	NA	NA	NA	NA
Barium	UG/L	NA	NA	NA	NA	NA
Cadmium	UG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12B	MWS-12B	MWS-12B	MWS-12B	MWS-12B
Sample ID		MWS-12B	MWS-12B	MWS-12B	MWS-12B	MWS-12B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		07/16/91	10/15/91	01/30/92	12/09/92	05/13/97
Parameter	**Units**					
Metals						
Calcium	UG/L	NA	NA	NA	NA	NA
Chromium	UG/L	NA	NA	NA	NA	NA
Iron	UG/L	NA	NA	NA	NA	156
Lead	UG/L	NA	NA	NA	NA	NA
Magnesium	UG/L	NA	NA	NA	NA	NA
Manganese	UG/L	NA	NA	NA	NA	5.0
Mercury	UG/L	NA	NA	NA	NA	NA
Potassium	UG/L	NA	NA	NA	NA	NA
Selenium	UG/L	NA	NA	NA	NA	NA
Sodium	UG/L	NA	NA	NA	NA	NA
Thallium	UG/L	NA	NA	NA	NA	NA
Dissolved Metals						
Arsenic -DISS	UG/L	NA	NA	11	26	NA
Barium -DISS	UG/L	NA	NA	766 J,m	820	NA
Cadmium -DISS	UG/L	NA	NA	5 U	5 U	NA
Calcium -DISS	UG/L	2,800,000	2,500,000	3,240,000	210,000 J,m	NA
Iron -DISS	UG/L	NA	NA	NA	NA	11.7
Magnesium -DISS	UG/L	NA	NA	NA	NA	NA
Manganese -DISS	UG/L	NA	NA	NA	NA	1.6
Mercury -DISS	UG/L	NA	NA	0.2 U	0.2 UJ,m	NA
Nickel -DISS	UG/L	NA	NA	40 U	40 U	NA
Potassium -DISS	UG/L	500,000	470,000	462,000	400,000	NA
Selenium -DISS	UG/L	NA	NA	25 UR,m	25 UR,m	NA
Sodium -DISS	UG/L	180,000	160,000	181,000	150,000	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12B	MWS-12B	MWS-12B	MWS-12B	MWS-12B
Sample ID		MWS-12B	MWS-12B	MWS-12B	MWS-12B	MWS-12B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		07/16/91	10/15/91	01/30/92	12/09/92	05/13/97
Parameter	**Units**					
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	510	440	430	540 J,f	NA
Alkalinity (Total)	MG/L	NA	NA	NA	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	NA	310	280	320	550
Chloride	MG/L	5,500	5,500	5,500	4,200	3,900
Cyanide	MG/L	NA	NA	0.010 U	1.6	NA
Dissolved Oxygen	MG/L	NA	NA	NA	NA	0.14
Field pH	S.U.	10.65	11.15	11.15	11.36	8.25
Nitrate Nitrogen	MG/L	NA	NA	NA	NA	NA
pH Liquid	S.U.	NA	NA	NA	NA	NA
Sulfate	MG/L	260	210	250	280	250
Total Organic Carbon	MG/L	13 J	44	44	51	NA
Total Dissolved Solids	MG/L	9,000 J	9,300	9,400	7,300	NA
Total Organic Halogens	MG/L	0.1	0.050 U	0.050 U	0.050 U	NA
Total Recoverable Phenolics	MG/L	0.35 J	0.28	0.34	0.34	NA
Turbidity	NTU	NA	NA	NA	NA	3.27
Redox Potential	Millivolts	NA	NA	NA	NA	-297.5
Temperature	DEG C	15.4	12.0	11.5	11.78	13.28
Specific Conductance	UMHOS/CM	NA	NA	NA	NA	9,640
Dissolved Gases						
Methane	MG/L	NA	NA	NA	NA	17.16
Nitrogen	MG/L	NA	NA	NA	NA	9.3
Oxygen	MG/L	NA	NA	NA	NA	0.48

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12B	MWS-13	MWS-13	MWS-13	MWS-13
Sample ID		MWS-12B	MWS-13	MWS-13	MWS-13	MWS-13
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		11/04/99	01/31/92	12/09/92	11/04/99	11/09/99
Parameter	Units					
Volatile Organic Compounds						
Benzene	UG/L	44	5 U	6.9	NA	5.0 U
1,1-Dichloroethane	UG/L	1.3 J	3.3 J	4.1 J	NA	1.5 J
Methylene chloride	UG/L	5.0 U	10 U	10 U	NA	5.0 U
Toluene	UG/L	1.3 J	5 U	5 U	NA	5.0 U
Semivolatile Organic Compounds						
Acenaphthylene	UG/L	50 U	10 U	10 U	NA	10 U
Anthracene	UG/L	50 U	10 U	10 U	NA	10 U
2,4-Dimethylphenol	UG/L	50 U	10 U	10 U	NA	10 U
bis(2-Ethylhexyl)phthalate	UG/L	50 U	10 U	10 U	NA	10 U
Fluoranthene	UG/L	50 U	10 U	10 U	NA	10 U
Fluorene	UG/L	50 U	10 U	10 U	NA	10 U
3-Methylphenol & 4-Methylphenol	UG/L	28 J	10 U	NA	NA	20 U
2-Methylphenol	UG/L	50 U	10 U	10 U	NA	10 U
4-Methylphenol	UG/L	NA	NA	1.0 J	NA	NA
Naphthalene	UG/L	200	5.7 J	9.0 J	NA	3.2 J
Phenanthrene	UG/L	50 U	10 U	2.0 J	NA	10 U
Phenol	UG/L	160 J	10 U	3.0 J	NA	10 U
Pyrene	UG/L	50 U	10 U	10 U	NA	10 U
Pyridine	UG/L	100 U	10 U	10 U	NA	20 UJ
Metals						
Antimony	UG/L	60 UJ	NA	NA	NA	10 UJ
Arsenic	UG/L	31.6	NA	NA	NA	10.0 U
Barium	UG/L	776 J	NA	NA	NA	122 B
Cadmium	UG/L	2.0 U	NA	NA	NA	2.0 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12B	MWS-13	MWS-13	MWS-13	MWS-13
Sample ID		MWS-12B	MWS-13	MWS-13	MWS-13	MWS-13
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		11/04/99	01/31/92	12/09/92	11/04/99	11/09/99
Parameter	Units					
Metals						
Calcium	UG/L	1,500,000	NA	NA	NA	272,000
Chromium	UG/L	6.0	NA	NA	NA	1.6 B
Iron	UG/L	147	NA	NA	NA	44.2 B
Lead	UG/L	3.0 U	NA	NA	NA	3.0 U
Magnesium	UG/L	179 B	NA	NA	NA	59.7 B
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	0.20 U	NA	NA	NA	0.20 U
Potassium	UG/L	385,000	NA	NA	NA	175,000
Selenium	UG/L	6.0	NA	NA	NA	16.4
Sodium	UG/L	130,000	NA	NA	NA	157,000
Thallium	UG/L	4 B	NA	NA	NA	10 U
Dissolved Metals						
Arsenic -DISS	UG/L	26.9	10 U	10 U	NA	NA
Barium -DISS	UG/L	680	374	200	NA	NA
Cadmium -DISS	UG/L	2.0 U	5 U	5 U	NA	NA
Calcium -DISS	UG/L	1,260,000	392,000	300,000 J,m	NA	NA
Iron -DISS	UG/L	20.6 B	NA	NA	NA	NA
Magnesium -DISS	UG/L	122 B	NA	NA	NA	NA
Manganese -DISS	UG/L	NA	NA	NA	NA	NA
Mercury -DISS	UG/L	0.20 U	0.2 U	0.2 UJ,m	NA	NA
Nickel -DISS	UG/L	8.2 B	40 U	40 U	NA	NA
Potassium -DISS	UG/L	371,000	273,000	240,000	NA	NA
Selenium -DISS	UG/L	4.7 B	25 U	25 UR,m	NA	NA
Sodium -DISS	UG/L	125,000	242,000	240,000	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 UPGRADIENT WELLS- MWS-13, MWS-12, AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12B	MWS-13	MWS-13	MWS-13	MWS-13
Sample ID		MWS-12B	MWS-13	MWS-13	MWS-13	MWS-13
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		11/04/99	01/31/92	12/09/92	11/04/99	11/09/99
Parameter	Units					
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	258	680	1,400 J,f	NA	70.8
Alkalinity (Total)	MG/L	439 J	NA	NA	NA	358 J
Carbonate Alkalinity (as CaCO3)	MG/L	NA	52	220	NA	NA
Chloride	MG/L	2,980	510	470	NA	278
Cyanide	MG/L	0.15 J	0.010 U	0.36	NA	0.066 J
Dissolved Oxygen	MG/L	0.5	NA	NA	0.5	NA
Field pH	S.U.	10.31	12.25	13.36	11.70	NA
Nitrate Nitrogen	MG/L	902	NA	NA	NA	0.10 U
pH Liquid	S.U.	NA	NA	NA	NA	NA
Sulfate	MG/L	163	530	540	NA	502
Total Organic Carbon	MG/L	35.4 J	10	13	NA	11.1
Total Dissolved Solids	MG/L	5,890	2,500	2,900	NA	1,620
Total Organic Halogens	MG/L	0.062 J	0.050 U	0.050 U	NA	0.0049 BJ
Total Recoverable Phenolics	MG/L	0.0050 U	0.006	0.05 U	NA	0.021
Turbidity	NTU	990	NA	NA	4.1	NA
Redox Potential	Millivolts	-412	NA	NA	93	NA
Temperature	DEG C	13.4	17.0	13.06	18.6	NA
Specific Conductance	UMHOS/CM	16,000	NA	NA	3,950	NA
Dissolved Gases						
Methane	MG/L	7.7	NA	NA	NA	2.2
Nitrogen	MG/L	13.3	NA	NA	NA	16.4
Oxygen	MG/L	0.42	NA	NA	NA	0.55

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 CROSS/DOWNGRADIENT WELL MWS-15
ZONE 2 SWMUS

Location ID		MWS-15	MWS-15	MWS-15
Sample ID		MWS-15	MWS-15	MWS-15
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-
Date Sampled		01/31/92	12/09/92	11/09/99
Parameter	**Units**			
Volatile Organic Compounds				
Benzene	UG/L	16 J,c	12	8.4
1,1-Dichloroethane	UG/L	5.4	6.0	4.4 J
Ethylbenzene	UG/L	6.8	9.4	6.7
Toluene	UG/L	6.8	6.4	2.2 J
Trichloroethene	UG/L	12	11	3.0 J
Xylenes, Total	UG/L	37	59	34
Semivolatile Organic Compounds				
Acenaphthylene	UG/L	16	11	6.1 J
2,4-Dimethylphenol	UG/L	9.4 J	6.0 J	10 U
Fluoranthene	UG/L	10 U	10 U	1.2 J
Fluorene	UG/L	17	9.0 J	2.6 J
3-Methylphenol & 4-Methylphenol	UG/L	15	NA	20 U
2-Methylphenol	UG/L	13	6.0 J	10 U
4-Methylphenol	UG/L	NA	8.0 J	NA
Naphthalene	UG/L	190	220	44
Phenanthrene	UG/L	23	12	4.2 J
Phenol	UG/L	24	14	10 U
Metals				
Barium	UG/L	NA	NA	57.1 B
Calcium	UG/L	NA	NA	351,000
Chromium	UG/L	NA	NA	1.5 B
Iron	UG/L	NA	NA	76.7 B
Magnesium	UG/L	NA	NA	99.6 B
Potassium	UG/L	NA	NA	85,900

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 CROSS/DOWNGRADIENT WELL MWS-15
ZONE 2 SWMUS

Location ID		MWS-15	MWS-15	MWS-15
Sample ID		MWS-15	MWS-15	MWS-15
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-
Date Sampled		01/31/92	12/09/92	11/09/99
Parameter	**Units**			
Metals				
Selenium	UG/L	NA	NA	5.0
Sodium	UG/L	NA	NA	40,600
Dissolved Metals				
Barium -DISS	UG/L	451	350	NA
Calcium -DISS	UG/L	413,000	380,000 J,m	NA
Potassium -DISS	UG/L	147,000	140,000	NA
Sodium -DISS	UG/L	96,400	85,000	NA
General Chemistry Parameters				
Alkalinity (as CaCO3)	MG/L	660	830 J,f	84.2
Alkalinity (Total)	MG/L	NA	NA	478
Carbonate Alkalinity (as CaCO3)	MG/L	80	180	NA
Chloride	MG/L	240	220	194
Cyanide	MG/L	0.02	0.24	0.010 U
Nitrate Nitrogen	MG/L	NA	NA	0.11
Sulfate	MG/L	380	480	463
Total Organic Carbon	MG/L	26	16	4.1
Total Dissolved Solids	MG/L	1,700	1,900	1,330
Total Organic Halogens	MG/L	0.050 U	0.050 U	0.0055 BJ
Total Recoverable Phenolics	MG/L	0.094	0.08	0.010
Dissolved Gases				
Methane	MG/L	NA	NA	0.79 J
Nitrogen	MG/L	NA	NA	17.7
Oxygen	MG/L	NA	NA	0.78

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

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([LOCID] = 'MWS-15') AND [LABCODE] <> 'FLD

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 DOWNGRADIENT WELLS- MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		MWS-09	MWS-09	MWS-09	MWS-09	MWS-09
Sample ID		MWS-09	MWS-09	MWS-09	MWS-09	MWS-09
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/25/91	04/19/91	07/17/91	10/16/91	01/21/92
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/L	5 U	1.4	1 U	1.4 J	5 U
1,1-Dichloroethane	UG/L	5 U	NA	NA	NA	2.3 J
Ethylbenzene	UG/L	5 U	NA	NA	NA	5 U
Methylene chloride	UG/L	10 U	NA	NA	NA	3.4 J
Toluene	UG/L	5 U	NA	NA	NA	5 U
Trichloroethene	UG/L	5 U	NA	NA	NA	5 U
Xylenes, Total	UG/L	8.6	NA	NA	NA	9.4
Semivolatile Organic Compounds						
Acenaphthene	UG/L	NA	NA	NA	NA	NA
Acenaphthylene	UG/L	10 U	NA	NA	NA	10 U
2,4-Dimethylphenol	UG/L	10 U	NA	NA	NA	10 U
bis(2-Ethylhexyl)phthalate	UG/L	37	NA	NA	NA	10 U
Fluoranthene	UG/L	10 U	NA	NA	NA	10 U
Fluorene	UG/L	10 U	NA	NA	NA	10 U
4-Methylphenol	UG/L	10 U	NA	NA	NA	NA
Naphthalene	UG/L	9 J	9.4 J	14	5.1 J	6.3 J
Phenanthrene	UG/L	10 U	NA	NA	NA	10 U
Phenol	UG/L	10 U	NA	NA	NA	10 U
Pyrene	UG/L	10 U	NA	NA	NA	10 U
Metals						
Antimony	UG/L	NA	NA	NA	NA	NA
Arsenic	UG/L	NA	NA	NA	NA	NA
Barium	UG/L	NA	NA	NA	NA	NA
Calcium	UG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 DOWNGRADIENT WELLS- MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		MWS-09	MWS-09	MWS-09	MWS-09	MWS-09
Sample ID		MWS-09	MWS-09	MWS-09	MWS-09	MWS-09
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/25/91	04/19/91	07/17/91	10/16/91	01/21/92
Parameter	**Units**					
Metals						
Chromium	UG/L	NA	NA	NA	NA	NA
Ferrous Iron	UG/L	NA	NA	NA	NA	NA
Iron	UG/L	NA	NA	NA	NA	NA
Lead	UG/L	NA	NA	NA	NA	NA
Magnesium	UG/L	NA	NA	NA	NA	NA
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	NA	NA	NA	NA	NA
Nickel	UG/L	NA	NA	NA	NA	NA
Potassium	UG/L	NA	NA	NA	NA	NA
Selenium	UG/L	NA	NA	NA	NA	NA
Sodium	UG/L	NA	NA	NA	NA	NA
Dissolved Metals						
Antimony -DISS	UG/L	60 U	NA	NA	NA	60 U
Arsenic -DISS	UG/L	10 U	NA	NA	NA	10 U
Barium -DISS	UG/L	200 U	NA	NA	NA	200 UJ,m
Cadmium -DISS	UG/L	5 U	NA	NA	NA	5 U
Calcium -DISS	UG/L	390,000	370,000 J	350,000	320,000	359,000 J,m
Chromium -DISS	UG/L	10 U	10 U	10 U	10 U	10 UJ,d
Iron -DISS	UG/L	NA	NA	NA	NA	NA
Magnesium -DISS	UG/L	NA	NA	NA	NA	NA
Potassium -DISS	UG/L	NA	180,000	170,000	160,000	192,000
Selenium -DISS	UG/L	25 UJ	NA	NA	NA	25 UR,m
Sodium -DISS	UG/L	91,000	77,000	73,000	70,000	84,800

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 DOWNGRADIENT WELLS- MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		MWS-09	MWS-09	MWS-09	MWS-09	MWS-09
Sample ID		MWS-09	MWS-09	MWS-09	MWS-09	MWS-09
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/25/91	04/19/91	07/17/91	10/16/91	01/21/92
Parameter	**Units**					
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	420	390	390	400	400
Alkalinity (Total)	MG/L	NA	NA	NA	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	NA	100	74	53	54
Chloride	MG/L	190 J	230	190	340	230
Cyanide	MG/L	0.010 UJ	NA	NA	NA	0.010 U
Nitrate Nitrogen	MG/L	NA	NA	NA	NA	NA
Sulfate	MG/L	740	680	620	590	660
Total Organic Carbon	MG/L	14	15	11 J	8	12
Total Dissolved Solids	MG/L	2,000	1,800	1,700 J	1,600	1,700
Total Organic Halogens	MG/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Total Recoverable Phenolics	MG/L	0.005 U	0.018	0.005 UJ	0.005 U	0.005 U
Dissolved Gases						
Methane	MG/L	NA	NA	NA	NA	NA
Nitrogen	MG/L	NA	NA	NA	NA	NA
Oxygen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 DOWNGRADIENT WELLS- MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		MWS-09	MWS-09	MWS-26A	MWS-26A	MWS-26A
Sample ID		MWS-09	MWS-09	MWS-26A	MWS-26A	MWS-26A
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/08/92	11/08/99	08/29/95	09/13/95	11/12/96
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/L	4.6 J	5.0 U	NA	8	5.0 U
1,1-Dichloroethane	UG/L	4.2 J	5.0 U	NA	2 J	NA
Ethylbenzene	UG/L	5 U	5.0 U	NA	10	NA
Methylene chloride	UG/L	10 U	5.0 U	NA	5 U	NA
Toluene	UG/L	5 U	5.0 U	NA	5	NA
Trichloroethene	UG/L	12	5.0 U	NA	5 U	NA
Xylenes, Total	UG/L	12	5.0 U	NA	77	NA
Semivolatile Organic Compounds						
Acenaphthene	UG/L	NA	NA	3 J	NA	NA
Acenaphthylene	UG/L	1.0 J	10 U	9 J	NA	NA
2,4-Dimethylphenol	UG/L	10 U	10 U	2 J	NA	NA
bis(2-Ethylhexyl)phthalate	UG/L	2.0 J	10 U	4 J	NA	NA
Fluoranthene	UG/L	10 U	10 U	4 J	NA	NA
Fluorene	UG/L	10 U	10 U	6 J	NA	NA
4-Methylphenol	UG/L	10 U	NA	2 J	NA	NA
Naphthalene	UG/L	10	10 U	150	NA	NA
Phenanthrene	UG/L	1.0 J	10 U	10 J	NA	NA
Phenol	UG/L	2.0 J	10 U	10 U	NA	NA
Pyrene	UG/L	10 U	10 U	4 J	NA	NA
Metals						
Antimony	UG/L	NA	60 UJ	4.5	NA	NA
Arsenic	UG/L	NA	10.0 U	28.1	NA	NA
Barium	UG/L	NA	27.2 B	217	NA	NA
Calcium	UG/L	NA	344,000	420,000	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 DOWNGRADIENT WELLS- MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		MWS-09	MWS-09	MWS-26A	MWS-26A	MWS-26A
Sample ID		MWS-09	MWS-09	MWS-26A	MWS-26A	MWS-26A
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/08/92	11/08/99	08/29/95	09/13/95	11/12/96
Parameter	**Units**					
Metals						
Chromium	UG/L	NA	40.4	75.3	NA	NA
Ferrous Iron	UG/L	NA	NA	NA	NA	2,700 J
Iron	UG/L	NA	110	NA	NA	10,930
Lead	UG/L	NA	3.0 U	358	NA	NA
Magnesium	UG/L	NA	8,430	NA	NA	NA
Manganese	UG/L	NA	NA	NA	NA	678.5
Mercury	UG/L	NA	0.20 U	0.3	NA	NA
Nickel	UG/L	NA	40 U	46	NA	NA
Potassium	UG/L	NA	76,000	148,000	NA	NA
Selenium	UG/L	NA	5.7	15 UJ,m	NA	NA
Sodium	UG/L	NA	48,400	70,900	NA	NA
Dissolved Metals						
Antimony -DISS	UG/L	60.0 UR,m	60 UJ	2.2 U	NA	NA
Arsenic -DISS	UG/L	10.00 U	10.0 U	2.2 J,v	NA	NA
Barium -DISS	UG/L	200 U	26.4 B	54.8	NA	NA
Cadmium -DISS	UG/L	5.0 U	0.29 B	2.8 U	NA	NA
Calcium -DISS	UG/L	280,000 J,m	340,000	237,000	NA	NA
Chromium -DISS	UG/L	10.00 U	0.51 B	5.7 U	NA	NA
Iron -DISS	UG/L	NA	16.0 B	NA	NA	21.3
Magnesium -DISS	UG/L	NA	21.5 B	NA	NA	NA
Potassium -DISS	UG/L	140,000	75,500	150,000	NA	NA
Selenium -DISS	UG/L	25.0 UR,m	4.9 B	3 UJ,m	NA	NA
Sodium -DISS	UG/L	63,000	47,600	73,300	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 DOWNGRADIENT WELLS- MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		MWS-09	MWS-09	MWS-26A	MWS-26A	MWS-26A
Sample ID		MWS-09	MWS-09	MWS-26A	MWS-26A	MWS-26A
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/08/92	11/08/99	08/29/95	09/13/95	11/12/96
Parameter	Units					
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	380	40.2	NA	NA	NA
Alkalinity (Total)	MG/L	NA	345 J	520	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	38	NA	NA	NA	NA
Chloride	MG/L	140	108	190	NA	NA
Cyanide	MG/L	0.17	0.010 U	NA	NA	NA
Nitrate Nitrogen	MG/L	NA	2.1	NA	NA	0.46 J
Sulfate	MG/L	740	594	580	NA	583
Total Organic Carbon	MG/L	12	10.7	20	NA	10.9
Total Dissolved Solids	MG/L	1,700	10,300	1,300	NA	NA
Total Organic Halogens	MG/L	0.050 UJ,h	0.0041 BJ	0.031	NA	NA
Total Recoverable Phenolics	MG/L	0.05 U	0.015	0.005 U	NA	NA
Dissolved Gases						
Methane	MG/L	NA	0.07 U	NA	NA	0.17
Nitrogen	MG/L	NA	16.8	NA	NA	11.2
Oxygen	MG/L	NA	1.4	NA	NA	0.64

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 DOWNGRADIENT WELLS- MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		**MWS-26A**
Sample ID		**MWS-26A**
Matrix		**Groundwater**
Depth Interval (ft)		**-**
Date Sampled		**11/08/99**
Parameter	**Units**	
Volatile Organic Compounds		
Benzene	UG/L	2.8 J
1,1-Dichloroethane	UG/L	5.0 U
Ethylbenzene	UG/L	5.3
Methylene chloride	UG/L	5.0 U
Toluene	UG/L	1.7 J
Trichloroethene	UG/L	5.0 U
Xylenes, Total	UG/L	37
Semivolatile Organic Compounds		
Acenaphthene	UG/L	NA
Acenaphthylene	UG/L	6.3 J
2,4-Dimethylphenol	UG/L	10 U
bis(2-Ethylhexyl)phthalate	UG/L	10 U
Fluoranthene	UG/L	1.6 J
Fluorene	UG/L	2.9 J
4-Methylphenol	UG/L	NA
Naphthalene	UG/L	43
Phenanthrene	UG/L	4.2 J
Phenol	UG/L	10 U
Pyrene	UG/L	10 U
Metals		
Antimony	UG/L	60 UJ
Arsenic	UG/L	3.6 B
Barium	UG/L	39.4 B
Calcium	UG/L	211,000

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 DOWNGRADIENT WELLS- MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		MWS-26A
Sample ID		MWS-26A
Matrix		Groundwater
Depth Interval (ft)		-
Date Sampled		11/08/99
Parameter	**Units**	
Metals		
Chromium	UG/L	33.6
Ferrous Iron	UG/L	NA
Iron	UG/L	1,220
Lead	UG/L	9.0
Magnesium	UG/L	1,260 B
Manganese	UG/L	NA
Mercury	UG/L	0.20 U
Nickel	UG/L	21.8 B
Potassium	UG/L	104,000
Selenium	UG/L	8.1
Sodium	UG/L	41,000
Dissolved Metals		
Antimony -DISS	UG/L	2.3 BJ
Arsenic -DISS	UG/L	1.9 B
Barium -DISS	UG/L	34.3 B
Cadmium -DISS	UG/L	2.0 U
Calcium -DISS	UG/L	211,000
Chromium -DISS	UG/L	0.50 B
Iron -DISS	UG/L	28.0 B
Magnesium -DISS	UG/L	119 B
Potassium -DISS	UG/L	102,000
Selenium -DISS	UG/L	7.6
Sodium -DISS	UG/L	41,100

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 1 DOWNGRADIENT WELLS- MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		MWS-26A
Sample ID		MWS-26A
Matrix		Groundwater
Depth Interval (ft)		-
Date Sampled		11/08/99
Parameter	**Units**	
General Chemistry Parameters		
Alkalinity (as CaCO3)	MG/L	156
Alkalinity (Total)	MG/L	298 J
Carbonate Alkalinity (as CaCO3)	MG/L	NA
Chloride	MG/L	104
Cyanide	MG/L	0.011
Nitrate Nitrogen	MG/L	0.15
Sulfate	MG/L	532
Total Organic Carbon	MG/L	6.2
Total Dissolved Solids	MG/L	1,050
Total Organic Halogens	MG/L	0.0064 BJ
Total Recoverable Phenolics	MG/L	0.0060
Dissolved Gases		
Methane	MG/L	0.33 J
Nitrogen	MG/L	19.4
Oxygen	MG/L	0.61

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 UPGRADIENT WELL- MWS-29A
ZONE 2 SWMUs

Location ID		MWS-29A
Sample ID		MWS-29A
Matrix		Groundwater
Depth Interval (ft)		-
Date Sampled		12/28/00
Parameter	**Units**	
Volatile Organic Compounds		
Benzene	UG/L	2.4 J
Metals		
Antimony	UG/L	10.9
Arsenic	UG/L	11.6
Barium	UG/L	47.9 B
Calcium	UG/L	66,900
Chromium	UG/L	15.7
Iron	UG/L	23.3 B
Magnesium	UG/L	34,200
Potassium	UG/L	32,500
Selenium	UG/L	6.7
Silver	UG/L	2.4 B
Sodium	UG/L	14,300
Dissolved Metals		
Antimony -DISS	UG/L	11.5
Arsenic -DISS	UG/L	11.7
Barium -DISS	UG/L	45.9 B
Calcium -DISS	UG/L	62,700
Chromium -DISS	UG/L	14.4
Iron -DISS	UG/L	22.2 B
Magnesium -DISS	UG/L	32,500
Potassium -DISS	UG/L	31,100
Selenium -DISS	UG/L	7.3 J
Sodium -DISS	UG/L	13,700

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 UPGRADIENT WELL- MWS-29A
ZONE 2 SWMUs

Location ID		MWS-29A
Sample ID		MWS-29A
Matrix		Groundwater
Depth Interval (ft)		-
Date Sampled		12/28/00
Parameter	**Units**	
General Chemistry Parameters		
Alkalinity (as CaCO3)	MG/L	12.7
Alkalinity (Total)	MG/L	159
Chloride	MG/L	5.2 J
Cyanide	MG/L	0.024 J
Sulfate	MG/L	202
Total Organic Carbon	MG/L	6.6
Total Dissolved Solids	MG/L	466
Total Organic Halogens	MG/L	0.0458 J
Total Recoverable Phenolics	MG/L	0.012
Dissolved Gases		
Carbon Dioxide	MG/L	1.2
Methane	MG/L	0.0013
Nitrogen	MG/L	22
Oxygen	MG/L	5.1

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 UPGRADIENT WELL- MWS-14 AND MWS-14B
ZONE 2 SWMUs

Location ID		MWS-14	MWS-14	MWS-14	MWS-14	MWS-14B
Sample ID		MWS-14	MWS-14	MWS-014	MWS-14A	MWS-14B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/31/92	12/10/92	11/05/99	11/10/99	12/15/92
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/L	18 J,c	11	3.6 J	NA	100
1,1-Dichloroethane	UG/L	17	23	4.3 J	NA	11
1,2-Dichloroethane	UG/L	4.3 J	4.6 J	1.4 J	NA	5 U
Methylene chloride	UG/L	3.5	10 U	1.2 J	NA	10 U
Toluene	UG/L	3.8 J	5 U	5.0 U	NA	23
Xylenes, Total	UG/L	2.9 J	5 U	5.0 U	NA	21
Semivolatile Organic Compounds						
Acenaphthylene	UG/L	72 J	48	29	NA	91
Anthracene	UG/L	8.7 J	20 U	5.6 J	NA	50 U
Benzo(a)anthracene	UG/L	110 U	20 U	1.4 J	NA	50 U
2,4-Dimethylphenol	UG/L	12 J	6.0 J	14 U	NA	66 J,s
Fluoranthene	UG/L	8.9 J	10 J	10 J	NA	50 UJ,Q
Fluorene	UG/L	49 J	44	26	NA	73
3-Methylphenol & 4-Methylphenol	UG/L	23 J	NA	28 U	NA	330 J,s
2-Methylphenol	UG/L	8.8 J	6.0 J	14 U	NA	96 J,s
4-Methylphenol	UG/L	NA	18 J	NA	NA	NA
Naphthalene	UG/L	440	320	100	NA	1,100
Phenanthrene	UG/L	57 J	54	41	NA	84
Phenol	UG/L	16 J	31	17	NA	700 J,s
Pyrene	UG/L	7.3 J,c	20 U	6.5 J	NA	50 U
Metals						
Arsenic	UG/L	NA	NA	2.1 B	NA	NA
Barium	UG/L	NA	NA	423	NA	NA
Cadmium	UG/L	NA	NA	0.53 B	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 UPGRADIENT WELL- MWS-14 AND MWS-14B
ZONE 2 SWMUs

Location ID		MWS-14	MWS-14	MWS-14	MWS-14	MWS-14B
Sample ID		MWS-14	MWS-14	MWS-014	MWS-14A	MWS-14B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/31/92	12/10/92	11/05/99	11/10/99	12/15/92
Parameter	**Units**					
Metals						
Calcium	UG/L	NA	NA	204,000 R	NA	NA
Chromium	UG/L	NA	NA	23.9 J	NA	NA
Ferrous Iron	UG/L	NA	NA	NA	NA	NA
Iron	UG/L	NA	NA	523	NA	NA
Lead	UG/L	NA	NA	8.0	NA	NA
Magnesium	UG/L	NA	NA	213 B	NA	NA
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	NA	NA	0.083 B	NA	NA
Nickel	UG/L	NA	NA	68.4	NA	NA
Potassium	UG/L	NA	NA	295,000	NA	NA
Selenium	UG/L	NA	NA	9.2	NA	NA
Sodium	UG/L	NA	NA	273,000	NA	NA
Dissolved Metals						
Arsenic -DISS	UG/L	10 U	10 U	NA	3.6 BJ	10 U
Barium -DISS	UG/L	1,530	1,500	NA	782 J	200 U
Cadmium -DISS	UG/L	5 U	5 U	NA	0.26 B	5 U
Calcium -DISS	UG/L	898,000	630,000 J,m	NA	402,000 R	850,000
Chromium -DISS	UG/L	10 U	10 U	NA	2.7 B	10 U
Iron -DISS	UG/L	NA	NA	NA	30.7 B	NA
Lead -DISS	UG/L	3 U	3 U	NA	7.5	15 U
Magnesium -DISS	UG/L	NA	NA	NA	21.4 B	NA
Manganese -DISS	UG/L	NA	NA	NA	NA	NA
Nickel -DISS	UG/L	40 U	64	NA	65	40 U
Potassium -DISS	UG/L	230,000	160,000	NA	277,000	220,000

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 UPGRADIENT WELL- MWS-14 AND MWS-14B
ZONE 2 SWMUs

Location ID		MWS-14	MWS-14	MWS-14	MWS-14	MWS-14B
Sample ID		MWS-14	MWS-14	MWS-014	MWS-14A	MWS-14B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/31/92	12/10/92	11/05/99	11/10/99	12/15/92
Parameter	**Units**					
Dissolved Metals						
Sodium -DISS	UG/L	174,000	120,000	NA	224,000	170,000
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	2,700	2,000	68.8	NA	140
Alkalinity (Total)	MG/L	NA	NA	913 J	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	41	NA	NA	NA	20
Chloride	MG/L	230	330	418	NA	1,100
Cyanide	MG/L	0.010 U	0.36	0.010 U	NA	2.4
Nitrate Nitrogen	MG/L	NA	NA	0.72	NA	NA
Sulfate	MG/L	5 U	82	32.0	NA	1,200
Total Organic Carbon	MG/L	18	23	38.8	NA	68
Total Dissolved Solids	MG/L	2,900	2,500	1,940	NA	4,000
Total Organic Halogens	MG/L	0.050 U	0.050 U	0.13 J	NA	0.050 UJ,h
Total Recoverable Phenolics	MG/L	0.12	0.08	0.040	NA	0.93
Dissolved Gases						
Methane	MG/L	NA	NA	0.20 J	NA	NA
Nitrogen	MG/L	NA	NA	15.0	NA	NA
Oxygen	MG/L	NA	NA	2.8	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 UPGRADIENT WELL- MWS-14 AND MWS-14B
ZONE 2 SWMUs

Location ID		MWS-14B	MWS-14B
Sample ID		MWS-14B	MWS-14B
Matrix		Groundwater	Groundwater
Depth Interval (ft)		-	-
Date Sampled		11/13/96	11/04/99
Parameter	**Units**		
Volatile Organic Compounds			
Benzene	UG/L	138	42
1,1-Dichloroethane	UG/L	NA	6.5
1,2-Dichloroethane	UG/L	NA	5.0 UJ
Methylene chloride	UG/L	NA	5.0 U
Toluene	UG/L	NA	6.3
Xylenes, Total	UG/L	NA	6.2
Semivolatile Organic Compounds			
Acenaphthylene	UG/L	NA	64
Anthracene	UG/L	NA	7.1 J
Benzo(a)anthracene	UG/L	NA	20 U
2,4-Dimethylphenol	UG/L	NA	23
Fluoranthene	UG/L	NA	10 J
Fluorene	UG/L	NA	51
3-Methylphenol & 4-Methylphenol	UG/L	NA	84
2-Methylphenol	UG/L	NA	23
4-Methylphenol	UG/L	NA	NA
Naphthalene	UG/L	NA	670 D
Phenanthrene	UG/L	NA	56
Phenol	UG/L	NA	78
Pyrene	UG/L	NA	8.8 J
Metals			
Arsenic	UG/L	NA	5.0 B
Barium	UG/L	NA	75.3 B
Cadmium	UG/L	NA	2.0 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 UPGRADIENT WELL- MWS-14 AND MWS-14B
ZONE 2 SWMUs

Location ID		MWS-14B	MWS-14B
Sample ID		MWS-14B	MWS-14B
Matrix		Groundwater	Groundwater
Depth Interval (ft)		-	-
Date Sampled		11/13/96	11/04/99
Parameter	**Units**		
Metals			
Calcium	UG/L	NA	827,000
Chromium	UG/L	NA	8.9
Ferrous Iron	UG/L	2,150 J	NA
Iron	UG/L	3,403	1,440
Lead	UG/L	NA	6.7
Magnesium	UG/L	NA	9,030
Manganese	UG/L	385.8	NA
Mercury	UG/L	NA	0.20 U
Nickel	UG/L	NA	8.8 B
Potassium	UG/L	NA	232,000
Selenium	UG/L	NA	5.0 U
Sodium	UG/L	NA	130,000
Dissolved Metals			
Arsenic -DISS	UG/L	NA	4.3 B
Barium -DISS	UG/L	NA	65.6 B
Cadmium -DISS	UG/L	NA	2.0 U
Calcium -DISS	UG/L	NA	797,000
Chromium -DISS	UG/L	NA	5.0 U
Iron -DISS	UG/L	15 U	13.6 B
Lead -DISS	UG/L	NA	3.0 U
Magnesium -DISS	UG/L	NA	7,260
Manganese -DISS	UG/L	6.7	NA
Nickel -DISS	UG/L	NA	40 U
Potassium -DISS	UG/L	NA	220,000

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 UPGRADIENT WELL- MWS-14 AND MWS-14B
ZONE 2 SWMUs

Location ID		MWS-14B	MWS-14B
Sample ID		MWS-14B	MWS-14B
Matrix		Groundwater	Groundwater
Depth Interval (ft)		-	-
Date Sampled		11/13/96	11/04/99
Parameter	Units		
Dissolved Metals			
Sodium -DISS	UG/L	NA	122,000
General Chemistry Parameters			
Alkalinity (as CaCO3)	MG/L	NA	32.9
Alkalinity (Total)	MG/L	NA	70.1 J
Carbonate Alkalinity (as CaCO3)	MG/L	NA	NA
Chloride	MG/L	NA	885
Cyanide	MG/L	NA	0.010
Nitrate Nitrogen	MG/L	0.08 UJ	0.10 U
Sulfate	MG/L	1,180	268
Total Organic Carbon	MG/L	33.8	21.4 J
Total Dissolved Solids	MG/L	NA	3,840
Total Organic Halogens	MG/L	NA	0.040 J
Total Recoverable Phenolics	MG/L	NA	0.26
Dissolved Gases			
Methane	MG/L	2.60	3.3
Nitrogen	MG/L	14.3	15.6
Oxygen	MG/L	0.60	0.50

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000880	G_000899	G_000900	G_000033	G_000056
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		06/01/86	11/06/87	01/13/88	01/29/91	04/18/91
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/L	1 U	23	28	17	22
Carbon disulfide	UG/L	NA	NA	NA	NA	NA
1,1-Dichloroethane	UG/L	NA	NA	NA	8.2	NA
1,2-Dichloroethene, Total	UG/L	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	UG/L	NA	NA	NA	6.7	NA
Ethylbenzene	UG/L	NA	NA	NA	9.5	NA
Methylene chloride	UG/L	NA	NA	NA	10 U	NA
Styrene	UG/L	NA	NA	NA	NA	NA
Toluene	UG/L	NA	NA	NA	9.8	NA
Trichloroethene	UG/L	NA	NA	NA	22	NA
Xylenes, Total	UG/L	NA	NA	NA	56	NA
Semivolatile Organic Compounds						
Acenaphthene	UG/L	NA	NA	NA	NA	NA
Acenaphthylene	UG/L	NA	NA	NA	10 U	NA
Anthracene	UG/L	NA	NA	NA	10 U	NA
Cresols, Total	UG/L	NA	NA	NA	NA	NA
Dibenzofuran	UG/L	NA	NA	NA	NA	NA
2,4-Dimethylphenol	UG/L	NA	NA	NA	10 U	NA
bis(2-Ethylhexyl)phthalate	UG/L	NA	NA	NA	10 U	NA
Fluoranthene	UG/L	NA	NA	NA	10 U	NA
Fluorene	UG/L	NA	NA	NA	24	NA
2-Methylnaphthalene	UG/L	NA	NA	NA	NA	NA
3-Methylphenol & 4-Methylphenol	UG/L	NA	NA	NA	NA	NA
2-Methylphenol	UG/L	NA	NA	NA	13	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

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TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000880	G_000899	G_000900	G_000033	G_000056
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		06/01/86	11/06/87	01/13/88	01/29/91	04/18/91
Parameter	Units					
Semivolatile Organic Compounds						
4-Methylphenol	UG/L	NA	NA	NA	10 U	NA
Naphthalene	UG/L	1 U	570	180	280	530
Phenanthrene	UG/L	NA	NA	NA	33	NA
Phenol	UG/L	45	21	10 U	10 U	NA
Pyrene	UG/L	NA	NA	NA	10 U	NA
Metals						
Arsenic	UG/L	NA	NA	NA	NA	NA
Barium	UG/L	NA	NA	NA	NA	NA
Calcium	UG/L	NA	NA	NA	NA	NA
Chromium	UG/L	NA	NA	NA	NA	NA
Iron	UG/L	NA	NA	NA	NA	NA
Lead	UG/L	NA	NA	NA	NA	NA
Magnesium	UG/L	NA	NA	NA	NA	NA
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	NA	NA	NA	NA	NA
Potassium	UG/L	NA	NA	NA	NA	NA
Selenium	UG/L	NA	NA	NA	NA	NA
Sodium	UG/L	NA	NA	NA	NA	NA
Dissolved Metals						
Arsenic -DISS	UG/L	NA	NA	NA	10 U	NA
Barium -DISS	UG/L	NA	NA	NA	200 U	NA
Cadmium -DISS	UG/L	NA	NA	NA	5 U	NA
Calcium -DISS	UG/L	NA	NA	NA	410000	380000
Chromium -DISS	UG/L	NA	NA	NA	10 U	10 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

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[LOCID] = 'MW-2U1' OR [LOCID] = 'MW-2U1B'

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000880	G_000899	G_000900	G_000033	G_000056
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		06/01/86	11/06/87	01/13/88	01/29/91	04/18/91
Parameter	Units					
Dissolved Metals						
Iron -DISS	UG/L	NA	NA	NA	NA	NA
Magnesium -DISS	UG/L	NA	NA	NA	NA	NA
Manganese -DISS	UG/L	NA	NA	NA	NA	NA
Mercury -DISS	UG/L	NA	NA	NA	0.2 U	NA
Nickel -DISS	UG/L	NA	NA	NA	40 U	NA
Potassium -DISS	UG/L	NA	NA	NA	NA	160000
Selenium -DISS	UG/L	NA	NA	NA	25 U	NA
Sodium -DISS	UG/L	NA	NA	NA	130000 J	120000
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	NA	NA	NA	570	590
Alkalinity Total	MG/L	NA	NA	NA	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	NA	NA	NA	NA	190
Chloride	MG/L	NA	NA	NA	570 J	480
Cyanide	MG/L	NA	NA	NA	0.010 U	NA
Nitrate Nitrogen	MG/L	NA	NA	NA	NA	NA
Sulfate	MG/L	NA	NA	NA	480	530
Total Organic Carbon	MG/L	NA	NA	NA	12	13
Total Dissolved Solids	MG/L	NA	NA	NA	1900	1800
Total Organic Halogens	MG/L	NA	NA	NA	0.06 J	0.06
Total Recoverable Phenolics	MG/L	NA	NA	NA	0.2	0.092
Total Suspended Solids	MG/L	NA	NA	NA	NA	NA
Dissolved Gases						
Methane	MG/L	NA	NA	NA	NA	NA
Nitrogen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000880	G_000899	G_000900	G_000033	G_000056
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		06/01/86	11/06/87	01/13/88	01/29/91	04/18/91
Parameter	Units					
Dissolved Gases						
Oxygen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000142	G_000157	G_000233	G_000231	G_000586
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		07/18/91	10/16/91	01/31/92	01/31/92	04/24/92
Parameter	**Units**				FIELD DUPLICATE (1-1)	
Volatile Organic Compounds						
Benzene	UG/L	20	24 J	17 J,c	22 J,c	23
Carbon disulfide	UG/L	NA	NA	NA	NA	81
1,1-Dichloroethane	UG/L	NA	NA	7.4 J	6.9	10
1,2-Dichloroethene, Total	UG/L	NA	NA	NA	NA	7.6
trans-1,2-Dichloroethene	UG/L	NA	NA	5 U	5 U	NA
Ethylbenzene	UG/L	NA	NA	6.7	4.7 J	13
Methylene chloride	UG/L	NA	NA	10 U	10 U	10 U
Styrene	UG/L	NA	NA	NA	NA	6.8
Toluene	UG/L	NA	NA	8.7	10	13
Trichloroethene	UG/L	NA	NA	15	22	24
Xylenes, Total	UG/L	NA	NA	47	71	88
Semivolatile Organic Compounds						
Acenaphthene	UG/L	NA	NA	NA	NA	3.5 J
Acenaphthylene	UG/L	NA	NA	26 J,s	31 J	19 J
Anthracene	UG/L	NA	NA	10 UJ,s	50 U	2.9 J
Cresols, Total	UG/L	NA	NA	NA	NA	NA
Dibenzofuran	UG/L	NA	NA	NA	NA	NA
2,4-Dimethylphenol	UG/L	NA	NA	7 J,s	8 J	14 J
bis(2-Ethylhexyl)phthalate	UG/L	NA	NA	10 UJ,s	50 U	40 U
Fluoranthene	UG/L	NA	NA	5 J,s	50 U	5.0 J
Fluorene	UG/L	NA	NA	22 J,s	22 J	24 J
2-Methylnaphthalene	UG/L	NA	NA	NA	NA	NA
3-Methylphenol & 4-Methylphenol	UG/L	NA	NA	7.5 J,s	9.7 J	NA
2-Methylphenol	UG/L	NA	NA	7.7 J,s	12 J	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000142	G_000157	G_000233	G_000231	G_000586
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		07/18/91	10/16/91	01/31/92	01/31/92	04/24/92
Parameter	Units				FIELD DUPLICATE (1-1)	
Semivolatile Organic Compounds						
4-Methylphenol	UG/L	NA	NA	NA	NA	NA
Naphthalene	UG/L	580	420	190 J,s	370	380
Phenanthrene	UG/L	NA	NA	30 J,s	30 J	30 J
Phenol	UG/L	NA	NA	10 UJ,s	50 U	10 U
Pyrene	UG/L	NA	NA	10 UJ,s	50 U	2.7 J
Metals						
Arsenic	UG/L	NA	NA	NA	NA	NA
Barium	UG/L	NA	NA	NA	NA	NA
Calcium	UG/L	NA	NA	NA	NA	NA
Chromium	UG/L	NA	NA	NA	NA	NA
Iron	UG/L	NA	NA	NA	NA	NA
Lead	UG/L	NA	NA	NA	NA	NA
Magnesium	UG/L	NA	NA	NA	NA	NA
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	NA	NA	NA	NA	NA
Potassium	UG/L	NA	NA	NA	NA	NA
Selenium	UG/L	NA	NA	NA	NA	NA
Sodium	UG/L	NA	NA	NA	NA	NA
Dissolved Metals						
Arsenic -DISS	UG/L	NA	NA	10 U	10 U	50 U
Barium -DISS	UG/L	NA	NA	200 U	200 U	200 U
Cadmium -DISS	UG/L	NA	NA	5 U	5 U	5.0 U
Calcium -DISS	UG/L	350000	360000	412000	401000	370000
Chromium -DISS	UG/L	10 U	10 U	10 U	10 U	10 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000142	G_000157	G_000233	G_000231	G_000586
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		07/18/91	10/16/91	01/31/92	01/31/92	04/24/92
Parameter	Units				FIELD DUPLICATE (1-1)	
Dissolved Metals						
Iron -DISS	UG/L	NA	NA	NA	NA	NA
Magnesium -DISS	UG/L	NA	NA	NA	NA	5000 U
Manganese -DISS	UG/L	NA	NA	NA	NA	NA
Mercury -DISS	UG/L	NA	NA	0.2 U	0.2 U	0.2 U
Nickel -DISS	UG/L	NA	NA	40 U	40 U	40 U
Potassium -DISS	UG/L	170000	190000	195000	190000	200000
Selenium -DISS	UG/L	NA	NA	5 U	25 U	NA
Sodium -DISS	UG/L	130000	130000	115000	102000	140000
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	590	550	570	590	560
Alkalinity Total	MG/L	NA	NA	NA	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	210	160	120	170	NA
Chloride	MG/L	470	37	290	360	360
Cyanide	MG/L	NA	NA	0.01	0.01	0.010 U
Nitrate Nitrogen	MG/L	NA	NA	NA	NA	0.02
Sulfate	MG/L	550	450	490	510	470
Total Organic Carbon	MG/L	13 J	14	11	11	NA
Total Dissolved Solids	MG/L	1800 J	1800	1800	1700	1800
Total Organic Halogens	MG/L	0.050 U	0.050 U	0.050 U	0.050 U	NA
Total Recoverable Phenolics	MG/L	0.066 J	0.067	0.04	0.056	NA
Total Suspended Solids	MG/L	NA	NA	NA	NA	NA
Dissolved Gases						
Methane	MG/L	NA	NA	NA	NA	NA
Nitrogen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000142	G_000157	G_000233	G_000231	G_000586
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		07/18/91	10/16/91	01/31/92	01/31/92	04/24/92
Parameter	Units				FIELD DUPLICATE (1-1)	
Dissolved Gases						
Oxygen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000587	G_000598	G_000279	G_000335	G_000514
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		04/24/92	07/14/92	12/04/92	03/18/93	03/31/93
Parameter	**Units**	FIELD DUPLICATE (1-1)				
Volatile Organic Compounds						
Benzene	UG/L	23	24	15	NA	13
Carbon disulfide	UG/L	52	20	NA	NA	NA
1,1-Dichloroethane	UG/L	10	5.0 U	7.4	NA	5.0 U
1,2-Dichloroethene, Total	UG/L	7.3	7.1	NA	NA	NA
trans-1,2-Dichloroethene	UG/L	NA	NA	5 U	NA	5.0 U
Ethylbenzene	UG/L	13	14	7.5	NA	9.5
Methylene chloride	UG/L	10 U	10 U	10 U	NA	NA
Styrene	UG/L	6.7	6.0	NA	NA	NA
Toluene	UG/L	12	14	9.0	NA	NA
Trichloroethene	UG/L	24	20	17	NA	NA
Xylenes, Total	UG/L	88	87	60	NA	NA
Semivolatile Organic Compounds						
Acenaphthene	UG/L	4.2 J	50 U	NA	50 U	NA
Acenaphthylene	UG/L	44	36 J	30	24 J	NA
Anthracene	UG/L	6.6 J	50 U	20 U	50 U	NA
Cresols, Total	UG/L	NA	NA	NA	NA	NA
Dibenzofuran	UG/L	NA	NA	NA	18 J	NA
2,4-Dimethylphenol	UG/L	16 J	18 J	6.0 J	10 J	NA
bis(2-Ethylhexyl)phthalate	UG/L	40 U	50 U	20 U	50 U	NA
Fluoranthene	UG/L	5.9 J	50 U	20 U	50 U	NA
Fluorene	UG/L	28 J	25 J	22	18 J	NA
2-Methylnaphthalene	UG/L	NA	NA	NA	58	NA
3-Methylphenol & 4-Methylphenol	UG/L	NA	NA	NA	NA	NA
2-Methylphenol	UG/L	NA	NA	10 J	16 J	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000587	G_000598	G_000279	G_000335	G_000514
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		04/24/92	07/14/92	12/04/92	03/18/93	03/31/93
Parameter	**Units**	FIELD DUPLICATE (1-1)				
Semivolatile Organic Compounds						
4-Methylphenol	UG/L	NA	NA	10 J	14 J	NA
Naphthalene	UG/L	540	490	430	360	NA
Phenanthrene	UG/L	35 J	32 J	25	22	NA
Phenol	UG/L	10 U	50 U	6.0 J	50 U	NA
Pyrene	UG/L	3.2 J	50 U	20 U	50 U	NA
Metals						
Arsenic	UG/L	NA	NA	NA	NA	NA
Barium	UG/L	NA	NA	NA	NA	NA
Calcium	UG/L	NA	NA	NA	NA	NA
Chromium	UG/L	NA	NA	NA	NA	NA
Iron	UG/L	NA	NA	NA	NA	NA
Lead	UG/L	NA	NA	NA	NA	NA
Magnesium	UG/L	NA	NA	NA	NA	NA
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	NA	NA	NA	NA	NA
Potassium	UG/L	NA	NA	NA	NA	NA
Selenium	UG/L	NA	NA	NA	NA	NA
Sodium	UG/L	NA	NA	NA	NA	NA
Dissolved Metals						
Arsenic -DISS	UG/L	50 U	10 U	10 U	10 U	NA
Barium -DISS	UG/L	200 U	200 U	200 U	200 U	NA
Cadmium -DISS	UG/L	5.0 U	5.0 U	5 U	5.0 U	NA
Calcium -DISS	UG/L	360000	380000	340000	320000	NA
Chromium -DISS	UG/L	10 U	10 U	10 U	10 U	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000587	G_000598	G_000279	G_000335	G_000514
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		04/24/92	07/14/92	12/04/92	03/18/93	03/31/93
Parameter	**Units**	FIELD DUPLICATE (1-1)				
Dissolved Metals						
Iron -DISS	UG/L	NA	NA	NA	NA	NA
Magnesium -DISS	UG/L	5000 U	5000 U	NA	5000 U	NA
Manganese -DISS	UG/L	NA	NA	NA	NA	NA
Mercury -DISS	UG/L	0.2 U	0.2 U	0.2 U	0.20 U	NA
Nickel -DISS	UG/L	40 U	40 U	40 U	40 U	NA
Potassium -DISS	UG/L	200000	210000	150000	160000	NA
Selenium -DISS	UG/L	NA	NA	5 UJ,m	25 U	NA
Sodium -DISS	UG/L	140000	140000	100000	100000	NA
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	580	600	540 J,h	550	NA
Alkalinity Total	MG/L	NA	NA	NA	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	NA	NA	120 J,h	NA	NA
Chloride	MG/L	380	410	350	340	NA
Cyanide	MG/L	0.010 U	0.010 U	0.02	0.01	NA
Nitrate Nitrogen	MG/L	0.01 U	0.01 U	NA	0.50 U	NA
Sulfate	MG/L	480	450	530	240	NA
Total Organic Carbon	MG/L	NA	NA	14	NA	NA
Total Dissolved Solids	MG/L	1800	1800	1700	1700	NA
Total Organic Halogens	MG/L	NA	NA	0.050 UJ,h	NA	NA
Total Recoverable Phenolics	MG/L	NA	NA	0.05	NA	NA
Total Suspended Solids	MG/L	NA	NA	NA	NA	NA
Dissolved Gases						
Methane	MG/L	NA	NA	NA	NA	NA
Nitrogen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000587	G_000598	G_000279	G_000335	G_000514
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		04/24/92	07/14/92	12/04/92	03/18/93	03/31/93
Parameter	Units	FIELD DUPLICATE (1-1)				
Dissolved Gases						
Oxygen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000349	G_000362	G_000383	G_000418	G_000613
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		06/18/93	09/16/93	11/17/93	01/26/94	05/05/94
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/L	14	15	14	27	15
Carbon disulfide	UG/L	NA	NA	NA	NA	NA
1,1-Dichloroethane	UG/L	8.7	8.6	8.8	5.0 U	9.2
1,2-Dichloroethene, Total	UG/L	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	UG/L	5 U	5 U	5 U	5.0 U	5.0 U
Ethylbenzene	UG/L	9.9	10	8.5	5.7	8.0
Methylene chloride	UG/L	10 U	2.7 J	10 U	10 U	10 U
Styrene	UG/L	NA	NA	NA	NA	NA
Toluene	UG/L	11	10	8.9	39	9.1
Trichloroethene	UG/L	19	20	20	5.0 U	16
Xylenes, Total	UG/L	70	66	63	75	58
Semivolatile Organic Compounds						
Acenaphthene	UG/L	NA	NA	NA	NA	NA
Acenaphthylene	UG/L	26 J	26 J	30 J	10 J	18 J
Anthracene	UG/L	50 U	43 U	50 U	20 U	40 U
Cresols, Total	UG/L	NA	NA	27 J	NA	NA
Dibenzofuran	UG/L	NA	NA	NA	NA	NA
2,4-Dimethylphenol	UG/L	50 U	43 U	50 U	20 U	40 U
bis(2-Ethylhexyl)phthalate	UG/L	50 U	23 J	50 U	20 U	40 U
Fluoranthene	UG/L	50 U	43 U	50 U	20 U	40 U
Fluorene	UG/L	30 J	21 J	24 J	5.5 J	30 J
2-Methylnaphthalene	UG/L	NA	NA	NA	NA	NA
3-Methylphenol & 4-Methylphenol	UG/L	14 J	15 J	NA	10 U	12 J
2-Methylphenol	UG/L	14 J	13 J	NA	20 U	10 J

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000349	G_000362	G_000383	G_000418	G_000613
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		06/18/93	09/16/93	11/17/93	01/26/94	05/05/94
Parameter	Units					
Semivolatile Organic Compounds						
4-Methylphenol	UG/L	NA	NA	NA	NA	NA
Naphthalene	UG/L	500	370	430	280	380
Phenanthrene	UG/L	42 J	24 J	30 J	10 J	38 J
Phenol	UG/L	50 U	43 U	50 U	20 U	40 U
Pyrene	UG/L	50 U	43 U	50 U	20 U	40 U
Metals						
Arsenic	UG/L	NA	NA	NA	NA	10 U
Barium	UG/L	NA	NA	NA	NA	200 U
Calcium	UG/L	NA	NA	NA	NA	NA
Chromium	UG/L	NA	NA	NA	NA	10 U
Iron	UG/L	NA	NA	NA	NA	NA
Lead	UG/L	NA	NA	NA	NA	3.0 U
Magnesium	UG/L	NA	NA	NA	NA	5000 U
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	NA	NA	NA	NA	0.20 U
Potassium	UG/L	NA	NA	NA	NA	141000
Selenium	UG/L	NA	NA	NA	NA	5.9
Sodium	UG/L	NA	NA	NA	NA	97400
Dissolved Metals						
Arsenic -DISS	UG/L	10 U	10 U	10 U	10 U	10 U
Barium -DISS	UG/L	200 U	200 U	200 U	200 U	200 U
Cadmium -DISS	UG/L	5 U	5 U	5 U	5 U	5.0 U
Calcium -DISS	UG/L	320000	260000	312000	156000	NA
Chromium -DISS	UG/L	10 U	10 U	10 U	10 U	10 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000349	G_000362	G_000383	G_000418	G_000613
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		06/18/93	09/16/93	11/17/93	01/26/94	05/05/94
Parameter	Units					
Dissolved Metals						
Iron -DISS	UG/L	NA	NA	NA	NA	NA
Magnesium -DISS	UG/L	NA	NA	NA	28100	5000 U
Manganese -DISS	UG/L	NA	NA	NA	NA	NA
Mercury -DISS	UG/L	0.2 U	0.2 U	0.2 U	0.20 U	0.2 U
Nickel -DISS	UG/L	40 U	40 U	40 U	40 U	40 U
Potassium -DISS	UG/L	160000	120000	153000	145000	155000
Selenium -DISS	UG/L	5 U	5 U	5 U	5.0 U	5.1
Sodium -DISS	UG/L	100000	85000	104000	89100	108000
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	580	580	NA	NA	NA
Alkalinity Total	MG/L	NA	NA	660	65.3	525
Carbonate Alkalinity (as CaCO3)	MG/L	140	160	140	18.1	80.8
Chloride	MG/L	320	330	271	269	268
Cyanide	MG/L	0.02	0.02	0.01	NA	0.020
Nitrate Nitrogen	MG/L	NA	0.1	0.029	0.82	0.48
Sulfate	MG/L	460	460	500	483	515
Total Organic Carbon	MG/L	16	15	12	NA	NA
Total Dissolved Solids	MG/L	1800	1800	2170	1410	1700
Total Organic Halogens	MG/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Total Recoverable Phenolics	MG/L	0.030	0.098	0.21	0.012	NA
Total Suspended Solids	MG/L	NA	5 U	5 U	NA	NA
Dissolved Gases						
Methane	MG/L	NA	NA	NA	NA	NA
Nitrogen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000349	G_000362	G_000383	G_000418	G_000613
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		06/18/93	09/16/93	11/17/93	01/26/94	05/05/94
Parameter	Units					
Dissolved Gases						
Oxygen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000614	G_000629	G_000630	G_000647	G_000665
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		05/05/94	10/18/94	10/18/94	05/26/95	11/14/95
Parameter	**Units**	FIELD DUPLICATE (1-1)		FIELD DUPLICATE (1-1)		
Volatile Organic Compounds						
Benzene	UG/L	15	17	16	17	11
Carbon disulfide	UG/L	NA	NA	NA	NA	NA
1,1-Dichloroethane	UG/L	8.7	10	9.0	8.2	5.5
1,2-Dichloroethene, Total	UG/L	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	UG/L	5.0 U	5.0 U	5.0 U	5.0 U	5 U
Ethylbenzene	UG/L	7.5	9.8	9.4	12	6.4
Methylene chloride	UG/L	10 U	10 U	10 U	3.2 J	10 U
Styrene	UG/L	NA	NA	NA	NA	NA
Toluene	UG/L	9.1	9.2	8.9	11	5.9
Trichloroethene	UG/L	16	17	15	15	11
Xylenes, Total	UG/L	61	69	68	95	54
Semivolatile Organic Compounds						
Acenaphthene	UG/L	NA	NA	NA	NA	NA
Acenaphthylene	UG/L	24 J	33	24 J	40 J	20
Anthracene	UG/L	40 U	30 U	30 U	5.9 J	20 U
Cresols, Total	UG/L	NA	NA	NA	NA	NA
Dibenzofuran	UG/L	NA	NA	NA	NA	NA
2,4-Dimethylphenol	UG/L	40 U	9.3 J	30 U	22 J	4.4 J
bis(2-Ethylhexyl)phthalate	UG/L	40 U	30 U	30 U	50 U	12 J
Fluoranthene	UG/L	40 U	30 U	30 U	50 U	20 U
Fluorene	UG/L	28 J	24 J	16 J	29 J	18 J
2-Methylnaphthalene	UG/L	NA	NA	NA	NA	NA
3-Methylphenol & 4-Methylphenol	UG/L	12 J	14 J	14 J	33 J	6 J
2-Methylphenol	UG/L	40 U	13 J	12 J	25 J	6 J

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000614	G_000629	G_000630	G_000647	G_000665
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		05/05/94	10/18/94	10/18/94	05/26/95	11/14/95
Parameter	Units	FIELD DUPLICATE (1-1)		FIELD DUPLICATE (1-1)		
Semivolatile Organic Compounds						
4-Methylphenol	UG/L	NA	NA	NA	NA	NA
Naphthalene	UG/L	380	340	320	340	250
Phenanthrene	UG/L	37 J	28 J	31	32 J	23
Phenol	UG/L	40 U	30 U	30 U	9 J	20 U
Pyrene	UG/L	40 U	30 U	30 U	50 U	20 U
Metals						
Arsenic	UG/L	10 U	10.0 U	10.0 U	10.0 U	10 U
Barium	UG/L	200 U	200 U	200 U	200 U	200 U
Calcium	UG/L	NA	NA	NA	273000	324000
Chromium	UG/L	10 U	10.0 U	10.0 U	10.0 U	10 U
Iron	UG/L	NA	NA	NA	NA	NA
Lead	UG/L	3.0 U	3.0 U	3.0 U	3.0 U	3 U
Magnesium	UG/L	5000 U	5000 U	5000 U	5000 U	5000 U
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U
Potassium	UG/L	142000	136000	142000	127000	124000
Selenium	UG/L	5.0 U	10.6	9.8	5.0 U	6.1
Sodium	UG/L	97300	84000	87400	75600	71300
Dissolved Metals						
Arsenic -DISS	UG/L	10 U	10.0 U	10.0 U	10.0 U	10 U
Barium -DISS	UG/L	200 U	200 U	200 U	200 U	200 U
Cadmium -DISS	UG/L	5.0 U	5.0 U	5.0 U	5.0 U	5 U
Calcium -DISS	UG/L	NA	NA	NA	298000	322000
Chromium -DISS	UG/L	10 U	10.0 U	10.0 U	10.0 U	10 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000614	G_000629	G_000630	G_000647	G_000665
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		05/05/94	10/18/94	10/18/94	05/26/95	11/14/95
Parameter	**Units**	FIELD DUPLICATE (1-1)		FIELD DUPLICATE (1-1)		
Dissolved Metals						
Iron -DISS	UG/L	NA	NA	NA	NA	NA
Magnesium -DISS	UG/L	5000 U	5000 U	5000 U	5000 U	5000 U
Manganese -DISS	UG/L	NA	NA	NA	NA	NA
Mercury -DISS	UG/L	0.2 U	0.20 U	0.20 U	0.20 U	0.2 U
Nickel -DISS	UG/L	40 U	40.0 U	40.0 U	NA	NA
Potassium -DISS	UG/L	156000	158000	167000	141000	121000
Selenium -DISS	UG/L	5 U	29.9	27.7	5.0 U	5 U
Sodium -DISS	UG/L	109000	96000	102000	85000	70200
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	NA	NA	NA	NA	NA
Alkalinity Total	MG/L	533	560	574	104	NA
Carbonate Alkalinity (as CaCO3)	MG/L	92.9	100	108	56	144
Chloride	MG/L	268	259	255	3040	250
Cyanide	MG/L	0.021	0.021	0.010 U	0.058	0.012
Nitrate Nitrogen	MG/L	0.22	0.020 U	0.020 U	0.020 U	0.02 U
Sulfate	MG/L	519	451	471	469	488
Total Organic Carbon	MG/L	NA	NA	NA	NA	NA
Total Dissolved Solids	MG/L	1740	1630	1650	1700	11500
Total Organic Halogens	MG/L	0.050 U	0.050 U	0.050 U	NA	NA
Total Recoverable Phenolics	MG/L	NA	NA	NA	NA	NA
Total Suspended Solids	MG/L	NA	NA	NA	NA	NA
Dissolved Gases						
Methane	MG/L	NA	NA	NA	NA	NA
Nitrogen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000614	G_000629	G_000630	G_000647	G_000665
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		05/05/94	10/18/94	10/18/94	05/26/95	11/14/95
Parameter	Units	FIELD DUPLICATE (1-1)		FIELD DUPLICATE (1-1)		
Dissolved Gases						
Oxygen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000682	G_000688	G_000741	G_000821	G_000939
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		05/02/96	11/07/96	05/05/97	05/20/97	11/20/97
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/L	13	7.9	7.7	NA	6.9
Carbon disulfide	UG/L	NA	NA	NA	NA	NA
1,1-Dichloroethane	UG/L	7.8	5.0	5.6	NA	3.1 J
1,2-Dichloroethene, Total	UG/L	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	UG/L	5.0 U	5.0 U	5.0 U	NA	5.0 U
Ethylbenzene	UG/L	8.2	4.3 J	6.7	NA	5.3
Methylene chloride	UG/L	10 U	5.0 U	5.0 U	NA	5.0 U
Styrene	UG/L	NA	NA	NA	NA	NA
Toluene	UG/L	9.0	4.1 J	4.9 J	NA	4.3 J
Trichloroethene	UG/L	15	7.1	9.3	NA	7.9
Xylenes, Total	UG/L	89	36	36	NA	35
Semivolatile Organic Compounds						
Acenaphthene	UG/L	NA	NA	NA	NA	NA
Acenaphthylene	UG/L	44	11 J	10	NA	16 J
Anthracene	UG/L	5.0 J	3.6 J	2.5 J	NA	50 U
Cresols, Total	UG/L	NA	NA	NA	NA	NA
Dibenzofuran	UG/L	NA	NA	NA	NA	NA
2,4-Dimethylphenol	UG/L	9.3 J	30 U	4.6 J	NA	50 U
bis(2-Ethylhexyl)phthalate	UG/L	5.4 J	30 U	10 U	NA	50 U
Fluoranthene	UG/L	4.2 J	3.3 J	5.1 J	NA	50 U
Fluorene	UG/L	25 J	14 J	13	NA	12 J
2-Methylnaphthalene	UG/L	NA	NA	NA	NA	NA
3-Methylphenol & 4-Methylphenol	UG/L	12 J	8.6 J	4.7 J	NA	50 U
2-Methylphenol	UG/L	11 J	7.3 J	3.8 J	NA	50 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000682	G_000688	G_000741	G_000821	G_000939
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		05/02/96	11/07/96	05/05/97	05/20/97	11/20/97
Parameter	Units					
Semivolatile Organic Compounds						
4-Methylphenol	UG/L	NA	NA	NA	NA	NA
Naphthalene	UG/L	320	270	110	NA	220
Phenanthrene	UG/L	28 J	21 J	22	NA	18 J
Phenol	UG/L	7.4 J	30 U	3.8 J	NA	50 U
Pyrene	UG/L	40 U	30 U	1.8 J	NA	50 U
Metals						
Arsenic	UG/L	10.0 U	10.0 U	10.0 U	NA	10.0 U
Barium	UG/L	200 U	56.2	52.5	NA	45.4
Calcium	UG/L	355000	361000	357000	NA	320000
Chromium	UG/L	10.0 U	10.0 U	10.0 U	NA	10.0 U
Iron	UG/L	NA	NA	38.2	NA	NA
Lead	UG/L	6.3	3.0 U	3.0 U	NA	3.0 U
Magnesium	UG/L	5000 U	17.4	5000 U	NA	57.4
Manganese	UG/L	NA	NA	2.2	NA	NA
Mercury	UG/L	0.20 U	0.20 U	0.20 U	NA	0.20 U
Potassium	UG/L	127000	119000	120000	NA	89900
Selenium	UG/L	9.2	8.8	8.6	NA	7.0
Sodium	UG/L	72100	63600	62800	NA	43600
Dissolved Metals						
Arsenic -DISS	UG/L	10.0 U	10.0 U	10.0 U	NA	10.0 U
Barium -DISS	UG/L	200 U	56.4	51.2	NA	49.2
Cadmium -DISS	UG/L	5.0 U	5.0 U	5.0 U	NA	2.0
Calcium -DISS	UG/L	332000	350000	364000	NA	336000
Chromium -DISS	UG/L	10.0 U	10.0 U	10.0 U	NA	10.0 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000682	G_000688	G_000741	G_000821	G_000939
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		05/02/96	11/07/96	05/05/97	05/20/97	11/20/97
Parameter	**Units**					
Dissolved Metals						
Iron -DISS	UG/L	NA	NA	71.9	NA	NA
Magnesium -DISS	UG/L	5000 U	29.3	44.0	NA	74.5
Manganese -DISS	UG/L	NA	NA	2.0	NA	NA
Mercury -DISS	UG/L	0.20 U	0.20 U	0.20 U	NA	0.073
Nickel -DISS	UG/L	NA	NA	NA	NA	NA
Potassium -DISS	UG/L	118000	120000	111000	NA	108000
Selenium -DISS	UG/L	6.4	10.6	8.4	NA	10.9
Sodium -DISS	UG/L	67100	63900	58200	NA	51900
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	NA	NA	NA	NA	NA
Alkalinity Total	MG/L	NA	NA	NA	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	120	110	90	NA	140
Chloride	MG/L	255	250	190	NA	180
Cyanide	MG/L	0.010 U	0.010 U	0.36	NA	0.012
Nitrate Nitrogen	MG/L	0.20 U	0.03	0.05	NA	0.04
Sulfate	MG/L	469	520	500	NA	500
Total Organic Carbon	MG/L	NA	NA	NA	NA	NA
Total Dissolved Solids	MG/L	NA	NA	1600	NA	1400
Total Organic Halogens	MG/L	NA	NA	NA	NA	NA
Total Recoverable Phenolics	MG/L	NA	NA	NA	NA	NA
Total Suspended Solids	MG/L	6.0	6.0	NA	NA	NA
Dissolved Gases						
Methane	MG/L	NA	NA	NA	1.66	NA
Nitrogen	MG/L	NA	NA	NA	21.2	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1	MW-2U1
Sample ID		G_000682	G_000688	G_000741	G_000821	G_000939
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		05/02/96	11/07/96	05/05/97	05/20/97	11/20/97
Parameter	Units					
Dissolved Gases						
Oxygen	MG/L	NA	NA	NA	0.87	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

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[LOCID] = 'MW-2U1' OR [LOCID] = 'MW-2U1B'

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1B	MW-2U1B
Sample ID		G_001007	G_001179	G_001192	G_000296	G_000336
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		04/16/98	10/22/98	04/14/99	12/14/92	03/18/93
Parameter	**Units**					
Volatile Organic Compounds						
Benzene	UG/L	7.6	4.8 J	10	17	NA
Carbon disulfide	UG/L	NA	NA	NA	NA	NA
1,1-Dichloroethane	UG/L	3.7 J	1.5 J	3.5 J	5 U	NA
1,2-Dichloroethene, Total	UG/L	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	UG/L	5.0 U	5.0 U	5.0 U	5 U	NA
Ethylbenzene	UG/L	3.7 J	4.0 J	10	5 U	NA
Methylene chloride	UG/L	5.0 U	5.0 U	1.1 J	10 UJ,c	NA
Styrene	UG/L	NA	NA	NA	NA	NA
Toluene	UG/L	5.0	3.4 J	6.7	10	NA
Trichloroethene	UG/L	8.8	3.5 J	5.5	5 U	NA
Xylenes, Total	UG/L	41	31.8	73	9.2	NA
Semivolatile Organic Compounds						
Acenaphthene	UG/L	NA	NA	NA	NA	400 U
Acenaphthylene	UG/L	19 J	33 J	34	400 U	400 U
Anthracene	UG/L	100 U	6.5 J	3.4 J	400 U	400 U
Cresols, Total	UG/L	NA	NA	NA	NA	NA
Dibenzofuran	UG/L	NA	NA	NA	NA	NA
2,4-Dimethylphenol	UG/L	100 U	16 J	11	400 U	400 U
bis(2-Ethylhexyl)phthalate	UG/L	100 U	50 U	10 U	400 U	400 U
Fluoranthene	UG/L	100 U	50 U	4.3 J	400 UJ,Q	400 U
Fluorene	UG/L	100 U	24 J	22	400 U	400 U
2-Methylnaphthalene	UG/L	NA	NA	NA	NA	NA
3-Methylphenol & 4-Methylphenol	UG/L	16 J	27 J	20	160 J	NA
2-Methylphenol	UG/L	9.9 J	16 J	14	100 J	110 J

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1B	MW-2U1B
Sample ID		G_001007	G_001179	G_001192	G_000296	G_000336
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		04/16/98	10/22/98	04/14/99	12/14/92	03/18/93
Parameter	**Units**					
Semivolatile Organic Compounds						
4-Methylphenol	UG/L	NA	NA	NA	NA	150 J
Naphthalene	UG/L	250	230	370	400 U	400 U
Phenanthrene	UG/L	22 J	31 J	22	400 U	400 U
Phenol	UG/L	100 U	24 J	20	3400	3300
Pyrene	UG/L	100 U	50 U	2.1 J	400 U	400 U
Metals						
Arsenic	UG/L	10 U	10 U	10 U	NA	NA
Barium	UG/L	51.3	64.0	61.9	NA	NA
Calcium	UG/L	340000	350000	335000	NA	NA
Chromium	UG/L	0.57	1.1	10 U	NA	NA
Iron	UG/L	NA	NA	NA	NA	NA
Lead	UG/L	3 U	3 U	3 U	NA	NA
Magnesium	UG/L	88.3	35.3	5000 U	NA	NA
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	0.2 U	0.2 U	0.2 U	NA	NA
Potassium	UG/L	106000	126000	109000	NA	NA
Selenium	UG/L	9.1	9.5	5.6	NA	NA
Sodium	UG/L	56000	58600	50100	NA	NA
Dissolved Metals						
Arsenic -DISS	UG/L	10 U	10 U	10 U	10 U	10 U
Barium -DISS	UG/L	56.1	65.9	60.6	10000	14000
Cadmium -DISS	UG/L	5 U	5 U	5 U	5 U	5.0 U
Calcium -DISS	UG/L	346000	339000	350000	790000	790000
Chromium -DISS	UG/L	10 U	10 U	10 U	10 U	10 U

Flags assigned during chemistry validation are shown.

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[LOCID] = 'MW-2U1' OR [LOCID] = 'MW-2U1B'

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1B	MW-2U1B
Sample ID		G_001007	G_001179	G_001192	G_000296	G_000336
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		04/16/98	10/22/98	04/14/99	12/14/92	03/18/93
Parameter	**Units**					
Dissolved Metals						
Iron -DISS	UG/L	NA	NA	NA	NA	NA
Magnesium -DISS	UG/L	72.5	5000 U	5000 U	NA	5000 U
Manganese -DISS	UG/L	NA	NA	NA	NA	NA
Mercury -DISS	UG/L	0.2 U	0.2 U	0.2 U	0.2 U	0.20 U
Nickel -DISS	UG/L	NA	NA	NA	40 U	40 U
Potassium -DISS	UG/L	108000	133000	109000	130000	1300000
Selenium -DISS	UG/L	7.9	9.0	8.8	25 U	25 U
Sodium -DISS	UG/L	57500	61800	51800	140000	160000
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	NA	NA	NA	3400	3500
Alkalinity Total	MG/L	NA	NA	NA	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	160	138	218	1200	NA
Chloride	MG/L	190	250	225	4400	5600
Cyanide	MG/L	0.014	0.010 U	0.010 U	0.06	0.02
Nitrate Nitrogen	MG/L	0.1 U	0.20 U	0.20 U	NA	1.0 U
Sulfate	MG/L	260	439	426	190	240
Total Organic Carbon	MG/L	NA	NA	NA	340 J,Q	NA
Total Dissolved Solids	MG/L	1500	1410	1260	5300	5400
Total Organic Halogens	MG/L	NA	NA	NA	0.050 U	NA
Total Recoverable Phenolics	MG/L	NA	NA	NA	5.3	NA
Total Suspended Solids	MG/L	NA	NA	NA	NA	NA
Dissolved Gases						
Methane	MG/L	NA	NA	NA	NA	NA
Nitrogen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1	MW-2U1	MW-2U1B	MW-2U1B
Sample ID		G_001007	G_001179	G_001192	G_000296	G_000336
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		04/16/98	10/22/98	04/14/99	12/14/92	03/18/93
Parameter	Units					
Dissolved Gases						
Oxygen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

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[LOCID] = 'MW-2U1' OR [LOCID] = 'MW-2U1B'

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1B	MW-2U1B	MW-2U1B
Sample ID		G_000338	G_000764	MW-2U1B
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-
Date Sampled		03/18/93	05/13/97	11/05/99
Parameter	Units	FIELD DUPLICATE (1-1)		
Volatile Organic Compounds				
Benzene	UG/L	NA	20	16
Carbon disulfide	UG/L	NA	NA	NA
1,1-Dichloroethane	UG/L	NA	2.5 J	5.0 U
1,2-Dichloroethene, Total	UG/L	NA	NA	NA
trans-1,2-Dichloroethene	UG/L	NA	5.0 U	2.5 U
Ethylbenzene	UG/L	NA	5.4	1.7 J
Methylene chloride	UG/L	NA	5.0 U	5.0 U
Styrene	UG/L	NA	NA	NA
Toluene	UG/L	NA	8.5	7.6
Trichloroethene	UG/L	NA	5.0 U	5.0 U
Xylenes, Total	UG/L	NA	46	17
Semivolatile Organic Compounds				
Acenaphthene	UG/L	400 U	NA	NA
Acenaphthylene	UG/L	400 U	50 U	200 U
Anthracene	UG/L	400 U	50 U	200 U
Cresols, Total	UG/L	NA	NA	NA
Dibenzofuran	UG/L	NA	NA	NA
2,4-Dimethylphenol	UG/L	400 U	27 J	200 U
bis(2-Ethylhexyl)phthalate	UG/L	400 U	17 J	200 U
Fluoranthene	UG/L	400 U	50 U	200 U
Fluorene	UG/L	400 U	50 U	200 U
2-Methylnaphthalene	UG/L	NA	NA	NA
3-Methylphenol & 4-Methylphenol	UG/L	NA	72 J,cl	110 J
2-Methylphenol	UG/L	84 J	46 J,c	78 J

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1B	MW-2U1B	MW-2U1B
Sample ID		G_000338	G_000764	MW-2U1B
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-
Date Sampled		03/18/93	05/13/97	11/05/99
Parameter	**Units**	FIELD DUPLICATE (1-1)		
Semivolatile Organic Compounds				
4-Methylphenol	UG/L	120 J	NA	NA
Naphthalene	UG/L	400 U	200 J,c	42 J
Phenanthrene	UG/L	400 U	50 U	200 U
Phenol	UG/L	3000	1100	2600 D
Pyrene	UG/L	400 U	50 U	200 U
Metals				
Arsenic	UG/L	NA	NA	5.4 B
Barium	UG/L	NA	NA	9860
Calcium	UG/L	NA	NA	702000
Chromium	UG/L	NA	NA	1.4 B
Iron	UG/L	NA	1530	37.3 B
Lead	UG/L	NA	NA	3.0 U
Magnesium	UG/L	NA	NA	5000 U
Manganese	UG/L	NA	40.0	NA
Mercury	UG/L	NA	NA	0.075 B
Potassium	UG/L	NA	NA	964000
Selenium	UG/L	NA	NA	12.2 R
Sodium	UG/L	NA	NA	148000
Dissolved Metals				
Arsenic -DISS	UG/L	10 U	NA	5.9 B
Barium -DISS	UG/L	13000	NA	9850
Cadmium -DISS	UG/L	5.0 U	NA	2.0 U
Calcium -DISS	UG/L	760000	NA	709000 J
Chromium -DISS	UG/L	10 U	NA	0.61 B

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1B	MW-2U1B	MW-2U1B
Sample ID		G_000338	G_000764	MW-2U1B
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-
Date Sampled		03/18/93	05/13/97	11/05/99
Parameter	**Units**	FIELD DUPLICATE (1-1)		
Dissolved Metals				
Iron -DISS	UG/L	NA	23.3	8.3 B
Magnesium -DISS	UG/L	5000 U	NA	16.4 B
Manganese -DISS	UG/L	NA	3.0	NA
Mercury -DISS	UG/L	0.20 U	NA	0.13 B
Nickel -DISS	UG/L	40 U	NA	13.5 B
Potassium -DISS	UG/L	1200000	NA	957000
Selenium -DISS	UG/L	25 U	NA	19.9 R
Sodium -DISS	UG/L	160000	NA	146000
General Chemistry Parameters				
Alkalinity (as CaCO3)	MG/L	3500	NA	2240
Alkalinity Total	MG/L	NA	NA	2730
Carbonate Alkalinity (as CaCO3)	MG/L	NA	950	NA
Chloride	MG/L	5600	2500	5060
Cyanide	MG/L	0.03	NA	0.010 U
Nitrate Nitrogen	MG/L	1.0 U	NA	0.10 U
Sulfate	MG/L	240	160	18.1
Total Organic Carbon	MG/L	NA	NA	209
Total Dissolved Solids	MG/L	5400	NA	4720
Total Organic Halogens	MG/L	NA	NA	0.0039 BJ
Total Recoverable Phenolics	MG/L	NA	NA	0.0050 U
Total Suspended Solids	MG/L	NA	NA	NA
Dissolved Gases				
Methane	MG/L	NA	6.98	20.7
Nitrogen	MG/L	NA	8.0	9.0

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1B	MW-2U1B	MW-2U1B
Sample ID		G_000338	G_000764	MW-2U1B
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-
Date Sampled		03/18/93	05/13/97	11/05/99
Parameter	Units	FIELD DUPLICATE (1-1)		
Dissolved Gases				
Oxygen	MG/L	NA	0.19	0.28 J

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01	MWS-01	MWS-01	MWS-01
Sample ID		G_000016	G_000040	G_000087	G_000145	G_000177
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/24/91	01/24/91	04/23/91	07/18/91	10/17/91
Parameter	Units		FIELD DUPLICATE (1-1)			
Volatile Organic Compounds						
Benzene	UG/L	63	62	94	130	100 J
1,1-Dichloroethane	UG/L	7.3	7.2	NA	NA	NA
Ethylbenzene	UG/L	8.6	5 U	NA	NA	NA
Methylene chloride	UG/L	6.9 J	7	NA	NA	NA
Toluene	UG/L	81	77	NA	NA	NA
Xylenes, Total	UG/L	120	110	NA	NA	NA
Semivolatile Organic Compounds						
Acenaphthylene	UG/L	24	100 U	NA	NA	NA
Anthracene	UG/L	20 U	100 U	NA	NA	NA
Benzo(a)anthracene	UG/L	20 U	100 U	NA	NA	NA
Butyl benzyl phthalate	UG/L	14	100 U	NA	NA	NA
2,4-Dichlorophenol	UG/L	20 U	100 U	NA	NA	NA
2,4-Dimethylphenol	UG/L	20 U	100 U	NA	NA	NA
Fluoranthene	UG/L	10	100 U	NA	NA	NA
Fluorene	UG/L	20	100 U	NA	NA	NA
3-Methylphenol & 4-Methylphenol	UG/L	NA	NA	NA	NA	NA
2-Methylphenol	UG/L	20 U	100 U	NA	NA	NA
Naphthalene	UG/L	510	610	710	230	720
Phenanthrene	UG/L	30	100 U	NA	NA	NA
Phenol	UG/L	20 U	100 U	NA	NA	NA
Pyrene	UG/L	10	100 U	NA	NA	NA
Metals						
Antimony	UG/L	NA	NA	NA	NA	NA
Arsenic	UG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01	MWS-01	MWS-01	MWS-01
Sample ID		G_000016	G_000040	G_000087	G_000145	G_000177
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/24/91	01/24/91	04/23/91	07/18/91	10/17/91
Parameter	**Units**		FIELD DUPLICATE (1-1)			
Metals						
Barium	UG/L	NA	NA	NA	NA	NA
Cadmium	UG/L	NA	NA	NA	NA	NA
Calcium	UG/L	NA	NA	NA	NA	NA
Chromium	UG/L	NA	NA	NA	NA	NA
Copper	UG/L	NA	NA	NA	NA	NA
Ferrous Iron	UG/L	NA	NA	NA	NA	NA
Iron	UG/L	NA	NA	NA	NA	NA
Lead	UG/L	NA	NA	NA	NA	NA
Magnesium	UG/L	NA	NA	NA	NA	NA
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	NA	NA	NA	NA	NA
Nickel	UG/L	NA	NA	NA	NA	NA
Potassium	UG/L	NA	NA	NA	NA	NA
Selenium	UG/L	NA	NA	NA	NA	NA
Sodium	UG/L	NA	NA	NA	NA	NA
Zinc	UG/L	NA	NA	NA	NA	NA
Dissolved Metals						
Arsenic -DISS	UG/L	10 U	10 U	NA	NA	NA
Barium -DISS	UG/L	200 U	200 U	NA	NA	NA
Cadmium -DISS	UG/L	36	5 U	NA	NA	NA
Calcium -DISS	UG/L	140,000 J	140,000 J	180,000	200,000	180,000
Chromium -DISS	UG/L	10 U	10 U	10 U	10 U	10 U
Iron -DISS	UG/L	NA	NA	NA	NA	NA
Magnesium -DISS	UG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01	MWS-01	MWS-01	MWS-01
Sample ID		G_000016	G_000040	G_000087	G_000145	G_000177
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/24/91	01/24/91	04/23/91	07/18/91	10/17/91
Parameter	**Units**		FIELD DUPLICATE (1-1)			
Dissolved Metals						
Manganese -DISS	UG/L	NA	NA	NA	NA	NA
Nickel -DISS	UG/L	40 U	40 U	NA	NA	NA
Potassium -DISS	UG/L	NA	NA	170,000	190,000	200,000
Selenium -DISS	UG/L	25 U	25 U	NA	NA	NA
Sodium -DISS	UG/L	140,000 J	140,000 J	150,000	160,000	170,000
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	76	72	92	96	120
Alkalinity Total	MG/L	NA	NA	NA	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	NA	NA	NA	40	61
Chloride	MG/L	190	190	240	270	270
Cyanide	MG/L	0.1	0.1	NA	NA	NA
Nitrate Nitrogen	MG/L	NA	NA	NA	NA	NA
Sulfate	MG/L	410	440	550	620	620
Total Organic Carbon	MG/L	14	13	17	20 J	25
Total Dissolved Solids	MG/L	1,200	1,200	1,500	1,600 J	1,600
Total Organic Halogens	MG/L	0.050 U	0.1	0.050 U	0.050 U	0.050 U
Total Recoverable Phenolics	MG/L	0.02	0.01	0.038	0.046 J	0.03
Total Suspended Solids	MG/L	NA	NA	NA	NA	NA
Total Solids	MG/L	NA	NA	NA	NA	NA
Dissolved Gases						
Carbon Dioxide	MG/L	NA	NA	NA	NA	NA
Methane	MG/L	NA	NA	NA	NA	NA
Nitrogen	MG/L	NA	NA	NA	NA	NA
Oxygen	MG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01	MWS-01	MWS-01	MWS-01
Sample ID		G_000219	G_000243	G_000461	G_000797	G_000799
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/21/92	12/09/92	10/25/94	11/13/96	11/13/96
Parameter	**Units**					FIELD DUPLICATE (1-1)
Volatile Organic Compounds						
Benzene	UG/L	104 J,c	140	190 J,I	82	97.1
1,1-Dichloroethane	UG/L	4.1 J	21	NA	NA	NA
Ethylbenzene	UG/L	17	22	100 U	NA	NA
Methylene chloride	UG/L	10 U	10 U	NA	NA	NA
Toluene	UG/L	145	200	320 J,c	NA	NA
Xylenes, Total	UG/L	240	300	100 U	NA	NA
Semivolatile Organic Compounds						
Acenaphthylene	UG/L	43 J	45 J	NA	NA	NA
Anthracene	UG/L	15 J	50 U	NA	NA	NA
Benzo(a)anthracene	UG/L	50 U	50 U	NA	NA	NA
Butyl benzyl phthalate	UG/L	50 U	50 U	NA	NA	NA
2,4-Dichlorophenol	UG/L	10 J	50 U	NA	NA	NA
2,4-Dimethylphenol	UG/L	50 U	50 U	NA	NA	NA
Fluoranthene	UG/L	36 J	25 J	NA	NA	NA
Fluorene	UG/L	56	60	NA	NA	NA
3-Methylphenol & 4-Methylphenol	UG/L	10 J	NA	NA	NA	NA
2-Methylphenol	UG/L	8.4 J	50 U	NA	NA	NA
Naphthalene	UG/L	660	900	NA	NA	NA
Phenanthrene	UG/L	110	86	NA	NA	NA
Phenol	UG/L	5.3 J	50 U	NA	NA	NA
Pyrene	UG/L	22 J	23 J	NA	NA	NA
Metals						
Antimony	UG/L	NA	NA	NA	NA	NA
Arsenic	UG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01	MWS-01	MWS-01	MWS-01
Sample ID		G_000219	G_000243	G_000461	G_000797	G_000799
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/21/92	12/09/92	10/25/94	11/13/96	11/13/96
Parameter	Units					FIELD DUPLICATE (1-1)
Metals						
Barium	UG/L	NA	NA	NA	NA	NA
Cadmium	UG/L	NA	NA	NA	NA	NA
Calcium	UG/L	NA	NA	NA	NA	NA
Chromium	UG/L	NA	NA	NA	NA	NA
Copper	UG/L	NA	NA	NA	NA	NA
Ferrous Iron	UG/L	NA	NA	NA	9,610 J	7,320 J
Iron	UG/L	NA	NA	NA	62,590	55,590
Lead	UG/L	NA	NA	NA	NA	NA
Magnesium	UG/L	NA	NA	NA	NA	NA
Manganese	UG/L	NA	NA	NA	1,736	1,479
Mercury	UG/L	NA	NA	NA	NA	NA
Nickel	UG/L	NA	NA	NA	NA	NA
Potassium	UG/L	NA	NA	NA	NA	NA
Selenium	UG/L	NA	NA	NA	NA	NA
Sodium	UG/L	NA	NA	NA	NA	NA
Zinc	UG/L	NA	NA	NA	NA	NA
Dissolved Metals						
Arsenic -DISS	UG/L	10 U	10 U	NA	NA	NA
Barium -DISS	UG/L	200 UJ,m	200 U	NA	NA	NA
Cadmium -DISS	UG/L	5 U	5 U	NA	NA	NA
Calcium -DISS	UG/L	118,000 J,m	120,000 J,m	NA	NA	NA
Chromium -DISS	UG/L	14 J,d	10 U	NA	NA	NA
Iron -DISS	UG/L	NA	NA	NA	85.6	64.8
Magnesium -DISS	UG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01	MWS-01	MWS-01	MWS-01
Sample ID		G_000219	G_000243	G_000461	G_000797	G_000799
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		01/21/92	12/09/92	10/25/94	11/13/96	11/13/96
Parameter	Units					FIELD DUPLICATE (1-1)
Dissolved Metals						
Manganese -DISS	UG/L	NA	NA	NA	6 U	6 U
Nickel -DISS	UG/L	40 U	40 U	NA	NA	NA
Potassium -DISS	UG/L	163,000	150,000	NA	NA	NA
Selenium -DISS	UG/L	5 UR,m	25 UR,m	NA	NA	NA
Sodium -DISS	UG/L	135,000	140,000	NA	NA	NA
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	120	150 J,f	NA	NA	NA
Alkalinity Total	MG/L	NA	NA	NA	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	62	71	NA	NA	NA
Chloride	MG/L	200	220	NA	NA	NA
Cyanide	MG/L	0.010 U	0.32	NA	NA	NA
Nitrate Nitrogen	MG/L	NA	NA	NA	0.08 UJ	0.08 UJ
Sulfate	MG/L	380	560	NA	574	556
Total Organic Carbon	MG/L	12	15	NA	13.4	14.4
Total Dissolved Solids	MG/L	1,000	1,300	NA	NA	NA
Total Organic Halogens	MG/L	0.050 U	0.050 U	NA	NA	NA
Total Recoverable Phenolics	MG/L	0.025	0.06	NA	NA	NA
Total Suspended Solids	MG/L	NA	NA	NA	NA	NA
Total Solids	MG/L	NA	NA	NA	NA	NA
Dissolved Gases						
Carbon Dioxide	MG/L	NA	NA	NA	0.3 U	0.3 U
Methane	MG/L	NA	NA	NA	2.48	3.36
Nitrogen	MG/L	NA	NA	NA	16.5	19.4
Oxygen	MG/L	NA	NA	NA	1.02	0.92

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01B	MWS-01B	MWS-01B	MWS-01B
Sample ID		MWS-1	G_000297	G_000494	G_000563	G_000798
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		11/08/99	12/14/92	01/27/95	01/27/95	11/13/96
Parameter	Units				FIELD DUPLICATE (1-1)	
Volatile Organic Compounds						
Benzene	UG/L	67	14	8	NA	9.0
1,1-Dichloroethane	UG/L	2.7 J	5 U	10	NA	NA
Ethylbenzene	UG/L	21	5 U	5 U	NA	NA
Methylene chloride	UG/L	5.0 U	10 U	10 U	NA	NA
Toluene	UG/L	130	24	3 J	NA	NA
Xylenes, Total	UG/L	350	60	4 J	NA	NA
Semivolatile Organic Compounds						
Acenaphthylene	UG/L	83 J	250 U	8.1 J	NA	NA
Anthracene	UG/L	13 J	250 U	30 U	NA	NA
Benzo(a)anthracene	UG/L	100 U	250 U	30 U	NA	NA
Butyl benzyl phthalate	UG/L	100 U	250 U	30 U	NA	NA
2,4-Dichlorophenol	UG/L	100 U	250 U	30 U	NA	NA
2,4-Dimethylphenol	UG/L	100 U	250 U	9.6 J	NA	NA
Fluoranthene	UG/L	100 U	250 UJ,Q	30 U	NA	NA
Fluorene	UG/L	57 J	250 U	9.3 J	NA	NA
3-Methylphenol & 4-Methylphenol	UG/L	200 U	250 U	16 J	NA	NA
2-Methylphenol	UG/L	100 U	250 U	30 U	NA	NA
Naphthalene	UG/L	1,000 D	2,800	410	NA	NA
Phenanthrene	UG/L	80 J	250 U	12 J	NA	NA
Phenol	UG/L	100 U	75 J	51	NA	NA
Pyrene	UG/L	100 U	250 U	30 U	NA	NA
Metals						
Antimony	UG/L	60 UJ	NA	151 J,c	165	NA
Arsenic	UG/L	5.9 B	NA	46.6	42.4	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01B	MWS-01B	MWS-01B	MWS-01B
Sample ID		MWS-1	G_000297	G_000494	G_000563	G_000798
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		11/08/99	12/14/92	01/27/95	01/27/95	11/13/96
Parameter	**Units**				FIELD DUPLICATE (1-1)	
Metals						
Barium	UG/L	58.4 B	NA	2,090	1,940	NA
Cadmium	UG/L	2.0 U	NA	16	17.1	NA
Calcium	UG/L	164,000	NA	576,000	555,000 J,k	NA
Chromium	UG/L	2.3 B	NA	97.3	103	NA
Copper	UG/L	NA	NA	NA	134	NA
Ferrous Iron	UG/L	NA	NA	NA	NA	63,700 J
Iron	UG/L	140	NA	NA	178,000	208,300
Lead	UG/L	3.0 U	NA	1,470	1,250	NA
Magnesium	UG/L	98.4 B	NA	NA	NA	NA
Manganese	UG/L	NA	NA	NA	4,160	4,541
Mercury	UG/L	0.20 U	NA	0.2 UJ,c	0.2 U	NA
Nickel	UG/L	40 U	NA	40 U	42.2	NA
Potassium	UG/L	158,000	NA	214,000 J,Q1	196,000 J,Q	NA
Selenium	UG/L	8.0 J	NA	5 UJ,Q	5 UR,Q	NA
Sodium	UG/L	83,600	NA	108,000 J,Q1	100,000 J,Q	NA
Zinc	UG/L	NA	NA	NA	6,630	NA
Dissolved Metals						
Arsenic -DISS	UG/L	6.3 B	10 U	10 U	10 U	NA
Barium -DISS	UG/L	58.3 B	2,300	2,080	1,990	NA
Cadmium -DISS	UG/L	2.0 U	5 U	5 U	5 U	NA
Calcium -DISS	UG/L	164,000	630,000	592,000	575,000	NA
Chromium -DISS	UG/L	5.0 U	10 U	10 U	10 U	NA
Iron -DISS	UG/L	69.8 B	NA	NA	10,400	8,891
Magnesium -DISS	UG/L	96.1 B	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01B	MWS-01B	MWS-01B	MWS-01B
Sample ID		MWS-1	G_000297	G_000494	G_000563	G_000798
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		11/08/99	12/14/92	01/27/95	01/27/95	11/13/96
Parameter	Units				FIELD DUPLICATE (1-1)	
Dissolved Metals						
Manganese -DISS	UG/L	NA	NA	NA	616	470.9
Nickel -DISS	UG/L	40 U	40 U	40 U	40 U	NA
Potassium -DISS	UG/L	158,000	240,000	246,000 J,Q1	231,000 J,Q	NA
Selenium -DISS	UG/L	9.9 J	5 U	6.7 J,Q1	14.4 R,Q	NA
Sodium -DISS	UG/L	83,300	120,000	124,000 J,Q1	112,000 J,Q	NA
General Chemistry Parameters						
Alkalinity (as CaCO3)	MG/L	47.5	200	NA	NA	NA
Alkalinity Total	MG/L	114 J	NA	268	NA	NA
Carbonate Alkalinity (as CaCO3)	MG/L	NA	NA	NA	NA	NA
Chloride	MG/L	149	1,800	1,700	NA	NA
Cyanide	MG/L	0.12	0.010 U	0.22 J,m	NA	NA
Nitrate Nitrogen	MG/L	0.12	NA	NA	NA	0.08 UJ
Sulfate	MG/L	559	5 U	5 U	NA	5.0 U
Total Organic Carbon	MG/L	13.3	55 J,Q	38.6	NA	31.7
Total Dissolved Solids	MG/L	1,160	3,100	3,400	NA	NA
Total Organic Halogens	MG/L	0.014 BJ	0.39	0.12	NA	NA
Total Recoverable Phenolics	MG/L	0.033	0.16	0.86	NA	NA
Total Suspended Solids	MG/L	NA	NA	1,130	NA	NA
Total Solids	MG/L	NA	NA	3,970	NA	NA
Dissolved Gases						
Carbon Dioxide	MG/L	0.60 U	NA	NA	NA	8.7
Methane	MG/L	5.1	NA	NA	NA	20.14
Nitrogen	MG/L	14.5	NA	NA	NA	2.8
Oxygen	MG/L	0.65	NA	NA	NA	0.24

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01B
Sample ID		MWS-1B
Matrix		Groundwater
Depth Interval (ft)		-
Date Sampled		11/10/99
Parameter	Units	
Volatile Organic Compounds		
Benzene	UG/L	16
1,1-Dichloroethane	UG/L	4.1 J
Ethylbenzene	UG/L	5.0 U
Methylene chloride	UG/L	5.0 U
Toluene	UG/L	4.8 J
Xylenes, Total	UG/L	4.4 J
Semivolatile Organic Compounds		
Acenaphthylene	UG/L	18
Anthracene	UG/L	2.6 J
Benzo(a)anthracene	UG/L	1.1 J
Butyl benzyl phthalate	UG/L	10 U
2,4-Dichlorophenol	UG/L	10 U
2,4-Dimethylphenol	UG/L	24
Fluoranthene	UG/L	3.6 J
Fluorene	UG/L	12
3-Methylphenol & 4-Methylphenol	UG/L	42
2-Methylphenol	UG/L	16
Naphthalene	UG/L	630 D
Phenanthrene	UG/L	13
Phenol	UG/L	150 D
Pyrene	UG/L	2.7 J
Metals		
Antimony	UG/L	19.1
Arsenic	UG/L	17.1

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01B
Sample ID		MWS-1B
Matrix		Groundwater
Depth Interval (ft)		-
Date Sampled		11/10/99
Parameter	**Units**	
Metals		
Barium	UG/L	1,620 J
Cadmium	UG/L	2.7
Calcium	UG/L	498,000
Chromium	UG/L	35.6
Copper	UG/L	NA
Ferrous Iron	UG/L	NA
Iron	UG/L	32,100
Lead	UG/L	278
Magnesium	UG/L	16,900
Manganese	UG/L	NA
Mercury	UG/L	0.077 B
Nickel	UG/L	23.6 B
Potassium	UG/L	228,000
Selenium	UG/L	5.0 U
Sodium	UG/L	120,000
Zinc	UG/L	NA
Dissolved Metals		
Arsenic -DISS	UG/L	6.9 BJ
Barium -DISS	UG/L	1,520 J
Cadmium -DISS	UG/L	2.0 U
Calcium -DISS	UG/L	474,000
Chromium -DISS	UG/L	0.73 B
Iron -DISS	UG/L	4,760
Magnesium -DISS	UG/L	16,200

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4
SUMMARY OF DETECTED GROUNDWATER ANALYTES
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01B
Sample ID		MWS-1B
Matrix		Groundwater
Depth Interval (ft)		-
Date Sampled		11/10/99
Parameter	Units	
Dissolved Metals		
Manganese -DISS	UG/L	NA
Nickel -DISS	UG/L	12.0 B
Potassium -DISS	UG/L	225,000
Selenium -DISS	UG/L	5.0 U
Sodium -DISS	UG/L	119,000
General Chemistry Parameters		
Alkalinity (as CaCO3)	MG/L	5.0 U
Alkalinity Total	MG/L	68.1 J
Carbonate Alkalinity (as CaCO3)	MG/L	NA
Chloride	MG/L	1,420
Cyanide	MG/L	0.10
Nitrate Nitrogen	MG/L	0.10 U
Sulfate	MG/L	5.0 U
Total Organic Carbon	MG/L	40.1
Total Dissolved Solids	MG/L	2,490
Total Organic Halogens	MG/L	0.093 J
Total Recoverable Phenolics	MG/L	0.39
Total Suspended Solids	MG/L	NA
Total Solids	MG/L	NA
Dissolved Gases		
Carbon Dioxide	MG/L	1.3 J
Methane	MG/L	24.1
Nitrogen	MG/L	3.3
Oxygen	MG/L	0.15 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 1 UPGRADIENT WELLS - MWS-13, MWS-12 AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12A	MWS-12B	MWS-13
Sample ID		MWS-12A	MWS-12B	MWS-13
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-
Date Sampled		11/04/99	11/04/99	11/09/99
Parameter	**Units**			
Volatile Organic Compounds				
Benzene	UG/L	55	44	5.0 U
1,1-Dichloroethane	UG/L	3.3 J	1.3 J	1.5 J
Toluene	UG/L	1.5 J	1.3 J	5.0 U
Semivolatile Organic Compounds				
Acenaphthylene	UG/L	1.6 J	50 U	10 U
Anthracene	UG/L	1.6 J	50 U	10 U
Fluoranthene	UG/L	2.4 J	50 U	10 U
Fluorene	UG/L	6.1 J	50 U	10 U
3-Methylphenol & 4-Methylphenol	UG/L	5.0 J	28 J	20 U
Naphthalene	UG/L	26	200	3.2 J
Phenanthrene	UG/L	9.4 J	50 U	10 U
Phenol	UG/L	18	160 J	10 U
Pyrene	UG/L	1.2 J	50 U	10 U
Pyridine	UG/L	4.9 J	100 U	20 UJ
Metals				
Antimony	UG/L	2.2 BJ	60 UJ	10 UJ
Arsenic	UG/L	10.0 U	31.6	10.0 U
Barium	UG/L	130 B	776 J	122 B
Cadmium	UG/L	0.33 B	2.0 U	2.0 U
Calcium	UG/L	132000 J	1500000	272000
Chromium	UG/L	3.3 B	6.0	1.6 B
Iron	UG/L	102 J	147	44.2 B
Lead	UG/L	1.3 B	3.0 U	3.0 U
Magnesium	UG/L	32.2 B	179 B	59.7 B

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 1 UPGRADIENT WELLS - MWS-13, MWS-12 AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12A	MWS-12B	MWS-13
Sample ID		MWS-12A	MWS-12B	MWS-13
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-
Date Sampled		11/04/99	11/04/99	11/09/99
Parameter	**Units**			
Metals				
Mercury	UG/L	0.083 B	0.20 U	0.20 U
Potassium	UG/L	320000	385000	175000
Selenium	UG/L	17.3	6.0	16.4
Sodium	UG/L	160000	130000	157000
Thallium	UG/L	10 U	4 B	10 U
Dissolved Metals				
Arsenic -DISS	UG/L	2.5 B	26.9	NA
Barium -DISS	UG/L	102 B	680	NA
Cadmium -DISS	UG/L	0.26 B	2.0 U	NA
Calcium -DISS	UG/L	147000 J	1260000	NA
Iron -DISS	UG/L	115 J	20.6 B	NA
Magnesium -DISS	UG/L	55.8 B	122 B	NA
Mercury -DISS	UG/L	0.089 B	0.20 U	NA
Nickel -DISS	UG/L	40 U	8.2 B	NA
Potassium -DISS	UG/L	326000	371000	NA
Selenium -DISS	UG/L	14.0	4.7 B	NA
Sodium -DISS	UG/L	165000	125000	NA
General Chemistry Parameters				
Alkalinity (as CaCO3)	MG/L	366	258	70.8
Alkalinity Total	MG/L	450 J	439 J	358 J
Chloride	MG/L	654	2980	278
Cyanide	MG/L	0.062	0.15 J	0.066 J
Nitrate Nitrogen	MG/L	0.10 U	902	0.10 U
Sulfate	MG/L	229	163	502

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 1 UPGRADIENT WELLS - MWS-13, MWS-12 AND MWS-12B
ZONE 2 SWMUS

Location ID		MWS-12A	MWS-12B	MWS-13
Sample ID		MWS-12A	MWS-12B	MWS-13
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft.)		-	-	-
Date Sampled		11/04/99	11/04/99	11/09/99
Parameter	Units			
General Chemistry Parameters				
Total Organic Carbon	MG/L	10.1 J	35.4 J	11.1
Total Dissolved Solids	MG/L	1450	5890	1620
Total Organic Halogens	MG/L	0.019 BJ	0.062 J	0.0049 BJ
Total Recoverable Phenolics	MG/L	0.052	0.0050 U	0.021
Dissolved Gases				
Methane	MG/L	4.7	7.7	2.2
Nitrogen	MG/L	15.9	13.3	16.4
Oxygen	MG/L	0.53	0.42	0.55

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

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([LOCID] = 'MWS-13' OR [LOCID] = 'MWS-12A' OR [LOCID] = 'MWS-12B') AND [LOGDATE] > #12/17/1998#

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 1 CROSS/DOWNGRADIENT WELL - MWS-15
ZONE 2 SWMUS

Location ID		**MWS-15**
Sample ID		**MWS-15**
Matrix		**Groundwater**
Depth Interval (ft.)		**-**
Date Sampled		**11/09/99**
Parameter	**Units**	
Volatile Organic Compounds		
Benzene	UG/L	8.4
1,1-Dichloroethane	UG/L	4.4 J
Ethylbenzene	UG/L	6.7
Toluene	UG/L	2.2 J
Trichloroethene	UG/L	3.0 J
Xylenes, Total	UG/L	34
Semivolatile Organic Compounds		
Acenaphthylene	UG/L	6.1 J
Fluoranthene	UG/L	1.2 J
Fluorene	UG/L	2.6 J
Naphthalene	UG/L	44
Phenanthrene	UG/L	4.2 J
Metals		
Barium	UG/L	57.1 B
Calcium	UG/L	351000
Chromium	UG/L	1.5 B
Iron	UG/L	76.7 B
Magnesium	UG/L	99.6 B
Potassium	UG/L	85900
Selenium	UG/L	5.0
Sodium	UG/L	40600
General Chemistry Parameters		
Alkalinity (as CaCO3)	MG/L	84.2
Alkalinity Total	MG/L	478

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 1 CROSS/DOWNGRADIENT WELL - MWS-15
ZONE 2 SWMUS

Location ID		MWS-15
Sample ID		MWS-15
Matrix		Groundwater
Depth Interval (ft.)		-
Date Sampled		11/09/99
Parameter	**Units**	
General Chemistry Parameters		
Chloride	MG/L	194
Nitrate Nitrogen	MG/L	0.11
Sulfate	MG/L	463
Total Organic Carbon	MG/L	4.1
Total Dissolved Solids	MG/L	1330
Total Organic Halogens	MG/L	0.0055 BJ
Total Recoverable Phenolics	MG/L	0.010
Dissolved Gases		
Methane	MG/L	0.79 J
Nitrogen	MG/L	17.7
Oxygen	MG/L	0.78

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 1 DOWNGRADIENT WELLS - MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		MWS-09	MWS-26A
Sample ID		MWS-9	MWS-26A
Matrix		Groundwater	Groundwater
Depth Interval (ft)		-	-
Date Sampled		11/08/99	11/08/99
Parameter	**Units**		
Volatile Organic Compounds			
Benzene	UG/L	5.0 U	2.8 J
Ethylbenzene	UG/L	5.0 U	5.3
Toluene	UG/L	5.0 U	1.7 J
Xylenes, Total	UG/L	5.0 U	37
Semivolatile Organic Compounds			
Acenaphthylene	UG/L	10 U	6.3 J
Fluoranthene	UG/L	10 U	1.6 J
Fluorene	UG/L	10 U	2.9 J
Naphthalene	UG/L	10 U	43
Phenanthrene	UG/L	10 U	4.2 J
Metals			
Arsenic	UG/L	10.0 U	3.6 B
Barium	UG/L	27.2 B	39.4 B
Calcium	UG/L	344,000	211,000
Chromium	UG/L	40.4	33.6
Iron	UG/L	110	1,220
Lead	UG/L	3.0 U	9.0
Magnesium	UG/L	8,430	1,260 B
Nickel	UG/L	40 U	21.8 B
Potassium	UG/L	76,000	104,000
Selenium	UG/L	5.7	8.1
Sodium	UG/L	48,400	41,000
Dissolved Metals			
Antimony -DISS	UG/L	60 UJ	2.3 BJ

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 1 DOWNGRADIENT WELLS - MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		MWS-09	MWS-26A
Sample ID		MWS-9	MWS-26A
Matrix		Groundwater	Groundwater
Depth Interval (ft)		-	-
Date Sampled		11/08/99	11/08/99
Parameter	**Units**		
Dissolved Metals			
Arsenic -DISS	UG/L	10.0 U	1.9 B
Barium -DISS	UG/L	26.4 B	34.3 B
Cadmium -DISS	UG/L	0.29 B	2.0 U
Calcium -DISS	UG/L	340,000	211,000
Chromium -DISS	UG/L	0.51 B	0.50 B
Iron -DISS	UG/L	16.0 B	28.0 B
Magnesium -DISS	UG/L	21.5 B	119 B
Potassium -DISS	UG/L	75,500	102,000
Selenium -DISS	UG/L	4.9 B	7.6
Sodium -DISS	UG/L	47,600	41,100
General Chemistry Parameters			
Alkalinity (as CaCO3)	MG/L	40.2	156
Alkalinity (Total)	MG/L	345 J	298 J
Chloride	MG/L	108	104
Cyanide	MG/L	0.010 U	0.011
Nitrate Nitrogen	MG/L	2.1	0.15
Sulfate	MG/L	594	532
Total Organic Carbon	MG/L	10.7	6.2
Total Dissolved Solids	MG/L	10,300	1,050
Total Organic Halogens	MG/L	0.0041 BJ	0.0064 BJ
Total Recoverable Phenolics	MG/L	0.015	0.0060
Dissolved Gases			
Methane	MG/L	0.07 U	0.33 J
Nitrogen	MG/L	16.8	19.4

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 1 DOWNGRADIENT WELLS - MWS-09 AND MWS-26A
ZONE 2 SWMUS

Location ID		MWS-09	MWS-26A
Sample ID		MWS-9	MWS-26A
Matrix		Groundwater	Groundwater
Depth Interval (ft)		-	-
Date Sampled		11/08/99	11/08/99
Parameter	Units		
Dissolved Gases			
Oxygen	MG/L	1.4	0.61

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 2 UPGRADIENT WELL - MWS-29A
ZONE 2 SWMUS

Location ID		MWS-29A
Sample ID		MWS-29A
Matrix		Groundwater
Depth Interval (ft)		-
Date Sampled		12/28/00
Parameter	Units	
Volatile Organic Compounds		
Benzene	UG/L	2.4 J
Metals		
Antimony	UG/L	10.9
Arsenic	UG/L	11.6
Barium	UG/L	47.9 B
Calcium	UG/L	66,900
Chromium	UG/L	15.7
Iron	UG/L	23.3 B
Magnesium	UG/L	34,200
Potassium	UG/L	32,500
Selenium	UG/L	6.7
Silver	UG/L	2.4 B
Sodium	UG/L	14,300
Dissolved Metals		
Antimony -DISS	UG/L	11.5
Arsenic -DISS	UG/L	11.7
Barium -DISS	UG/L	45.9 B
Calcium -DISS	UG/L	62,700
Chromium -DISS	UG/L	14.4
Iron -DISS	UG/L	22.2 B
Magnesium -DISS	UG/L	32,500
Potassium -DISS	UG/L	31,100
Selenium -DISS	UG/L	7.3 J
Sodium -DISS	UG/L	13,700

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

J:\4200008B.15\DB\program\PROGRAM.MDE
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([LOCID] = 'MWS-29A') AND [LOGDATE] > #12/17/98#

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 2 UPGRADIENT WELL - MWS-29A
ZONE 2 SWMUS

Location ID		MWS-29A
Sample ID		MWS-29A
Matrix		Groundwater
Depth Interval (ft)		-
Date Sampled		12/28/00
Parameter	**Units**	
General Chemistry Parameters		
Alkalinity (as CaCO3)	MG/L	12.7
Alkalinity Total	MG/L	159
Chloride	MG/L	5.2 J
Cyanide	MG/L	0.024 J
Sulfate	MG/L	202
Total Organic Carbon	MG/L	6.6
Total Dissolved Solids	MG/L	466
Total Organic Halogens	MG/L	0.0458 J
Total Recoverable Phenolics	MG/L	0.012
Dissolved Gases		
Carbon Dioxide	MG/L	1.2
Methane	MG/L	0.0013
Nitrogen	MG/L	22
Oxygen	MG/L	5.1

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1B
Sample ID		G_001192	MW-2U1B
Matrix		Groundwater	Groundwater
Depth Interval (ft.)		-	-
Date Sampled		04/14/99	11/05/99
Parameter	**Units**		
Volatile Organic Compounds			
Benzene	UG/L	10	16
1,1-Dichloroethane	UG/L	3.5 J	5.0 U
Ethylbenzene	UG/L	10	1.7 J
Methylene chloride	UG/L	1.1 J	5.0 U
Toluene	UG/L	6.7	7.6
Trichloroethene	UG/L	5.5	5.0 U
Xylenes, Total	UG/L	73	17
Semivolatile Organic Compounds			
Acenaphthylene	UG/L	34	200 U
Anthracene	UG/L	3.4 J	200 U
2,4-Dimethylphenol	UG/L	11	200 U
Fluoranthene	UG/L	4.3 J	200 U
Fluorene	UG/L	22	200 U
3-Methylphenol & 4-Methylphenol	UG/L	20	110 J
2-Methylphenol	UG/L	14	78 J
Naphthalene	UG/L	370	42 J
Phenanthrene	UG/L	22	200 U
Phenol	UG/L	20	2600 D
Pyrene	UG/L	2.1 J	200 U
Metals			
Arsenic	UG/L	10 U	5.4 B
Barium	UG/L	61.9	9860
Calcium	UG/L	335000	702000
Chromium	UG/L	10 U	1.4 B

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1B
Sample ID		G_001192	MW-2U1B
Matrix		Groundwater	Groundwater
Depth Interval (ft.)		-	-
Date Sampled		04/14/99	11/05/99
Parameter	Units		
Metals			
Iron	UG/L	NA	37.3 B
Mercury	UG/L	0.2 U	0.075 B
Potassium	UG/L	109000	964000
Selenium	UG/L	5.6	12.2 R
Sodium	UG/L	50100	148000
Dissolved Metals			
Arsenic -DISS	UG/L	10 U	5.9 B
Barium -DISS	UG/L	60.6	9850
Calcium -DISS	UG/L	350000	709000 J
Chromium -DISS	UG/L	10 U	0.61 B
Iron -DISS	UG/L	NA	8.3 B
Magnesium -DISS	UG/L	5000 U	16.4 B
Mercury -DISS	UG/L	0.2 U	0.13 B
Nickel -DISS	UG/L	NA	13.5 B
Potassium -DISS	UG/L	109000	957000
Selenium -DISS	UG/L	8.8	19.9 R
Sodium -DISS	UG/L	51800	146000
General Chemistry Parameters			
Alkalinity (as CaCO3)	MG/L	NA	2240
Alkalinity Total	MG/L	NA	2730
Carbonate Alkalinity (as CaCO3)	MG/L	218	NA
Chloride	MG/L	225	5060
Sulfate	MG/L	426	18.1
Total Organic Carbon	MG/L	NA	209

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 2 DOWNGRADIENT WELLS - MW-2U1 AND MW-2U1B
ZONE 2 SWMUS

Location ID		MW-2U1	MW-2U1B
Sample ID		G_001192	MW-2U1B
Matrix		Groundwater	Groundwater
Depth Interval (ft.)		-	-
Date Sampled		04/14/99	11/05/99
Parameter	Units		
General Chemistry Parameters			
Total Dissolved Solids	MG/L	1260	4720
Total Organic Halogens	MG/L	NA	0.0039 BJ
Dissolved Gases			
Methane	MG/L	NA	20.7
Nitrogen	MG/L	NA	9.0
Oxygen	MG/L	NA	0.28 J

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

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([LOCID] = 'MW-2U1' OR [LOCID] = 'MW-2U1B') AND [LOGDATE] > #12/17/1998#

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 3 UPGRADIENT WELLS - MWS-14 AND MWS-14B
ZONE 2 SWMUS

Location ID		MWS-14	MWS-14	MWS-14B
Sample ID		MWS-14A	MWS-14A	MWS-14B
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-
Date Sampled		11/05/99	11/10/99	11/04/99
Parameter	**Units**			
Volatile Organic Compounds				
Benzene	UG/L	3.6 J	NA	42
1,1-Dichloroethane	UG/L	4.3 J	NA	6.5
1,2-Dichloroethane	UG/L	1.4 J	NA	5.0 UJ
Methylene chloride	UG/L	1.2 J	NA	5.0 U
Toluene	UG/L	5.0 U	NA	6.3
Xylenes, Total	UG/L	5.0 U	NA	6.2
Semivolatile Organic Compounds				
Acenaphthylene	UG/L	29	NA	64
Anthracene	UG/L	5.6 J	NA	7.1 J
Benzo(a)anthracene	UG/L	1.4 J	NA	20 U
2,4-Dimethylphenol	UG/L	14 U	NA	23
Fluoranthene	UG/L	10 J	NA	10 J
Fluorene	UG/L	26	NA	51
3-Methylphenol & 4-Methylphenol	UG/L	28 U	NA	84
2-Methylphenol	UG/L	14 U	NA	23
Naphthalene	UG/L	100	NA	670 D
Phenanthrene	UG/L	41	NA	56
Phenol	UG/L	17	NA	78
Pyrene	UG/L	6.5 J	NA	8.8 J
Metals				
Arsenic	UG/L	2.1 B	NA	5.0 B
Barium	UG/L	423	NA	75.3 B
Cadmium	UG/L	0.53 B	NA	2.0 U
Calcium	UG/L	204,000 R	NA	827,000

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 3 UPGRADIENT WELLS - MWS-14 AND MWS-14B
ZONE 2 SWMUS

Location ID		MWS-14	MWS-14	MWS-14B
Sample ID		MWS-14A	MWS-14A	MWS-14B
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-
Date Sampled		11/05/99	11/10/99	11/04/99
Parameter	Units			
Metals				
Chromium	UG/L	23.9 J	NA	8.9
Iron	UG/L	523	NA	1,440
Lead	UG/L	8.0	NA	6.7
Magnesium	UG/L	213 B	NA	9,030
Mercury	UG/L	0.083 B	NA	0.20 U
Nickel	UG/L	68.4	NA	8.8 B
Potassium	UG/L	295,000	NA	232,000
Selenium	UG/L	9.2	NA	5.0 U
Sodium	UG/L	273,000	NA	130,000
Dissolved Metals				
Arsenic -DISS	UG/L	NA	3.6 BJ	4.3 B
Barium -DISS	UG/L	NA	782 J	65.6 B
Cadmium -DISS	UG/L	NA	0.26 B	2.0 U
Calcium -DISS	UG/L	NA	402,000 R	797,000
Chromium -DISS	UG/L	NA	2.7 B	5.0 U
Iron -DISS	UG/L	NA	30.7 B	13.6 B
Lead -DISS	UG/L	NA	7.5	3.0 U
Magnesium -DISS	UG/L	NA	21.4 B	7,260
Nickel -DISS	UG/L	NA	65	40 U
Potassium -DISS	UG/L	NA	277,000	220,000
Sodium -DISS	UG/L	NA	224,000	122,000
General Chemistry Parameters				
Alkalinity (as CaCO3)	MG/L	68.8	NA	32.9
Alkalinity Total	MG/L	913 J	NA	70.1 J

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 3 UPGRADIENT WELLS - MWS-14 AND MWS-14B
ZONE 2 SWMUS

Location ID		MWS-14	MWS-14	MWS-14B
Sample ID		MWS-14A	MWS-14A	MWS-14B
Matrix		Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-
Date Sampled		11/05/99	11/10/99	11/04/99
Parameter	**Units**			
General Chemistry Parameters				
Chloride	MG/L	418	NA	885
Cyanide	MG/L	0.010 U	NA	0.010
Nitrate Nitrogen	MG/L	0.72	NA	0.10 U
Sulfate	MG/L	32.0	NA	268
Total Organic Carbon	MG/L	38.8	NA	21.4 J
Total Dissolved Solids	MG/L	1,940	NA	3,840
Total Organic Halogens	MG/L	0.13 J	NA	0.040 J
Total Recoverable Phenolics	MG/L	0.040	NA	0.26
Dissolved Gases				
Methane	MG/L	0.20 J	NA	3.3
Nitrogen	MG/L	15.0	NA	15.6
Oxygen	MG/L	2.8	NA	0.50

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01B
Sample ID		MWS-1	MWS-1B
Matrix		Groundwater	Groundwater
Depth Interval (ft)		-	-
Date Sampled		11/08/99	11/10/99
Parameter	Units		
Volatile Organic Compounds			
Benzene	UG/L	67	16
1,1-Dichloroethane	UG/L	2.7 J	4.1 J
Ethylbenzene	UG/L	21	5.0 U
Toluene	UG/L	130	4.8 J
Xylenes, Total	UG/L	350	4.4 J
Semivolatile Organic Compounds			
Acenaphthylene	UG/L	83 J	18
Anthracene	UG/L	13 J	2.6 J
Benzo(a)anthracene	UG/L	100 U	1.1 J
2,4-Dimethylphenol	UG/L	100 U	24
Fluoranthene	UG/L	100 U	3.6 J
Fluorene	UG/L	57 J	12
3-Methylphenol & 4-Methylphenol	UG/L	200 U	42
2-Methylphenol	UG/L	100 U	16
Naphthalene	UG/L	1,000 D	630 D
Phenanthrene	UG/L	80 J	13
Phenol	UG/L	100 U	150 D
Pyrene	UG/L	100 U	2.7 J
Metals			
Antimony	UG/L	60 UJ	19.1
Arsenic	UG/L	5.9 B	17.1
Barium	UG/L	58.4 B	1,620 J
Cadmium	UG/L	2.0 U	2.7
Calcium	UG/L	164,000	498,000

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01B
Sample ID		MWS-1	MWS-1B
Matrix		Groundwater	Groundwater
Depth Interval (ft)		-	-
Date Sampled		11/08/99	11/10/99
Parameter	Units		
Metals			
Chromium	UG/L	2.3 B	35.6
Iron	UG/L	140	32,100
Lead	UG/L	3.0 U	278
Magnesium	UG/L	98.4 B	16,900
Mercury	UG/L	0.20 U	0.077 B
Nickel	UG/L	40 U	23.6 B
Potassium	UG/L	158,000	228,000
Selenium	UG/L	8.0 J	5.0 U
Sodium	UG/L	83,600	120,000
Dissolved Metals			
Arsenic -DISS	UG/L	6.3 B	6.9 BJ
Barium -DISS	UG/L	58.3 B	1,520 J
Calcium -DISS	UG/L	164,000	474,000
Chromium -DISS	UG/L	5.0 U	0.73 B
Iron -DISS	UG/L	69.8 B	4,760
Magnesium -DISS	UG/L	96.1 B	16,200
Nickel -DISS	UG/L	40 U	12.0 B
Potassium -DISS	UG/L	158,000	225,000
Selenium -DISS	UG/L	9.9 J	5.0 U
Sodium -DISS	UG/L	83,300	119,000
General Chemistry Parameters			
Alkalinity (as CaCO3)	MG/L	47.5	5.0 U
Alkalinity Total	MG/L	114 J	68.1 J
Chloride	MG/L	149	1,420

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 4A
SUMMARY OF DETECTED GROUNDWATER ANALYTES - 1999-2000
AREA 3 DOWNGRADIENT WELLS - MWS-01 AND MWS-01B
ZONE 2 SWMUS

Location ID		MWS-01	MWS-01B
Sample ID		MWS-1	MWS-1B
Matrix		Groundwater	Groundwater
Depth Interval (ft)		-	-
Date Sampled		11/08/99	11/10/99
Parameter	Units		
General Chemistry Parameters			
Cyanide	MG/L	0.12	0.10
Nitrate Nitrogen	MG/L	0.12	0.10 U
Sulfate	MG/L	559	5.0 U
Total Organic Carbon	MG/L	13.3	40.1
Total Dissolved Solids	MG/L	1,160	2,490
Total Organic Halogens	MG/L	0.014 BJ	0.093 J
Total Recoverable Phenolics	MG/L	0.033	0.39
Dissolved Gases			
Carbon Dioxide	MG/L	0.60 U	1.3 J
Methane	MG/L	5.1	24.1
Nitrogen	MG/L	14.5	3.3
Oxygen	MG/L	0.65	0.15 U

Flags assigned during chemistry validation are shown.

Only Detected Results Reported.

Detection Limits shown are PQL

TABLE 5
SUMMARY OF CHEMICALS OF POTENTIAL CONCERN (COPC) SELECTION PROCESS
SURFACE SWMU MATERIAL
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Chemical	Number of Samples	Number of Detects	Detection Frequency	Maximum Detected Concentration (mg/kg)	Maximum Background Concentration (mg/kg)	Region III Residential Soil RBC (mg/kg)[a]	Human Health COPC?[b]
Volatiles							
Benzene	17	2	12%	1.6	0.01	12	No
Carbon disulfide	11	1	9%	0.002	NA	7,800	No
Ethylbenzene	11	1	9%	2.5	NA	7,800	No
Methylene chloride	17	2	12%	0.01	NA	85	No
Methyl ethyl ketone	11	2	18%	0.59	NA	47,000	No
Toluene	17	3	18%	3.6	0.006	16,000	No
Trichloroethene	17	4	24%	0.015	NA	58	No
Xylenes, Total	17	1	6%	12	NA	160,000	No
Semivolatiles							
Acenaphthene	11	1	9%	170	0.34	4,700	No
Acenaphthylene	17	4	24%	200	1.1	4,700[g]	No
Anthracene	17	2	12%	460	1.9	23,000	No
Benzo(a)anthracene	17	9	53%	630	6.7	0.87	**Yes**
Benzo(a)pyrene	17	9	53%	330	6	0.087	**Yes**
Benzo(b)fluoranthene	11	7	64%	490	12	0.87	**Yes**
Benzo(k)fluoranthene	11	3	27%	150	3.3	8.7	**Yes**
Benzo(g,h,i)perylene	11	4	36%	170	5.9	2,300[h]	No
Bis(2-ethylhexyl)phthalate	17	4	24%	0.98	2.7	46	No
Chrysene	17	12	71%	540	4.9	87	**Yes**
Dibenz(a,h)anthracene	11	1	9%	38	1.8	0.087	**Yes**
Fluoranthene	17	13	76%	1,500	12	3,100	No
Fluorene	17	2	12%	710	0.81	3,100	No
Indeno(1,2,3-c,d)pyrene	11	6	55%	210	6	0.87	**Yes**
Naphthalene	17	7	41%	1,500	0.22	1,600	No
Phenanthrene	17	7	41%	1,900	8.1	2,300[h]	No
Pyrene	17	11	65%	1,200	10	2,300	No
Metals							
Antimony	17	5	29%	375	1	31	**Yes**
Arsenic	17	17	100%	23	12	0.43	**Yes**
Barium	17	11	65%	82.4	84.3	5,500	No
Cadmium	17	11	65%	27	NA	78	No
Chromium	9	9	100%	299	27.1	230[c]	**Yes**
Lead	17	16	94%	3,670	30	400[d]	**Yes**
Mercury	17	9	53%	5.6	0.32	23[e]	No
Nickel	17	11	65%	139.0	27.7	1,600	No
Selenium	14	5	36%	11.9	0.6	390	No
Silver	17	2	12%	1.6	NA	390	No
Thallium	17	2	12%	7.2	NA	6	**Yes**
Miscellaneous							
Cyanide	17	10	59%	32.2	NA	1,600[f]	No

[a] USEPA Region III Residential Soil Risk Based Concentration (RBC) (USEPA 2000b).

[b] Chemicals with a detection frequency greater than 5% and a maximum concentration greater than background and are retained as COPCs.

[c] Chromium is compared to the RBC for hexavalent chromium.

[d] Lead lacks standard toxicity criteria and RBCs. A value of 400 mg/kg (protective of children) is used for screening purposes (USEPA 1994).

[e] Mercury is compared to the RBC for mercuric chloride.

[f] Cyanide is compared to the RBC for free cyanide.

[g] Acenaphthene used as a surrogate for acenaphthylene.

[h] Pyrene used as a surrogate for phenanthrene and benzo(g,h,i)perylene.

NA Not available

TABLE 6
SUMMARY OF CHEMICALS OF POTENTIAL CONCERN (COPC) SELECTION PROCESS
SUBSURFACE SWMU MATERIAL
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Chemical	Number of Samples	Number of Detects	Detection Frequency	Maximum Detected Concentration (mg/kg)	Soil Screening Criteria[a] (mg/kg)	Human Health COPC?[b]
Volatiles						
1,1-Dichloroethane	15	1	7%	0.036	1,300	No
1,2-Dichloroethane	15	1	7%	0.005	0.4	No
1,2-Dichloroethene, total	10	3	30%	7.6	3,100[i]	No
1,1,1-Trichloroethane	16	1	6%	0.054	1,200	No
Benzene	16	9	56%	9.5	0.8	**Yes**
Carbon disulfide	16	1	6%	0.01	720[c]	No
Ethylbenzene	16	4	25%	1.4	400[c]	No
Methylene chloride	16	6	38%	6.4	13	No
Methyl ethyl ketone	15	2	13%	0.03	21,000[d]	No
Toluene	16	11	69%	12	650[c]	No
Trichloroethene	16	2	13%	3	5	No
Xylenes, Total	16	10	63%	5.3	410[c,e]	No
Volatile Semivolatiles						
Acenaphthene	16	4	25%	0.3	120[c,d]	No
Acenaphthylene	16	4	25%	46	NA	**Yes**
Anthracene	16	4	25%	0.34	6.8[c,d]	No
Fluorene	16	5	31%	46	89[c,d]	No
Naphthalene	16	12	75%	1,600	180[c,d]	**Yes**
Phenanthrene	16	8	50%	130	NA	**Yes**
Semivolatiles						
2,4-Dimethylphenol	15	1	7%	0.12	1,600	No
3-Methylphenol & 4-Methylphenol	12	6	50%	20	390	No
Benzo(a)anthracene	16	6	38%	3.2	0.87	**Yes**
Benzo(b)fluoranthene	16	7	44%	2	0.87	**Yes**
Benzo(k)fluoranthene	16	2	13%	0.6	8.7	No
Benzo(g,h,i)perylene	16	1	6%	0.38	NA	**Yes**
Benzo(a)pyrene	16	1	6%	0.49	0.087	**Yes**
Bis(2-ethylhexyl)phthalate	16	1	6%	0.19	46	No
Chrysene	16	7	44%	3.0	87	No
Fluoranthene	16	7	44%	80	3,100	No
Indeno(1,2,3-c,d)pyrene	16	1	6%	0.25	0.87	No
Phenol	15	2	13%	12	47,000	No
Pyrene	16	8	50%	64	2,300	No

TABLE 6
SUMMARY OF CHEMICALS OF POTENTIAL CONCERN (COPC) SELECTION PROCESS
SUBSURFACE SWMU MATERIAL
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Chemical	Number of Samples	Number of Detects	Detection Frequency	Maximum Detected Concentration (mg/kg)	Soil Screening Criteria[a] (mg/kg)	Human Health COPC?[b]
Metals						
Antimony	15	1	7%	16.2	31	No
Arsenic	16	16	100%	31.1	0.43	**Yes**
Barium	16	9	56%	129	5,500	No
Cadmium	15	14	93%	37.7	78	No
Chromium	15	15	100%	203	230[f]	No
Lead	16	16	100%	1,630	400[g]	**Yes**
Mercury	16	10	63%	0.8	23[h]	No
Nickel	16	13	81%	135	1600	No
Selenium	14	4	29%	11.1	390	No
Silver	12	4	33%	6.1	390	No
Thallium	16	6	38%	5.9	5.5	**Yes**
Miscellaneous						
Cyanide	12	11	92%	24.2	1,600	No

a For volatile chemicals, USEPA Soil Screening Levels for vapor inhalation were used (Generic SSLs) (USEPA 1996a); for semivolatile chemicals and metals, USEPA Region III Residential Soil Risk Based Concentrations (RBCs) (USEPA 2000b) are used.

b Chemicals with a detection frequency greater than 5% and a maximum concentration greater than the screening criteria are retained as COPCs.

c Soil saturation concentration (C_{sat}); the concentration at which soil pore air is saturated with a chemical, and volatile emissions reach their maximum. (USEPA 1996a).

d SSL calculated per EPA SSL guidance (USEPA 1996a).

e Most conservative value for xylene isomers (o-xylene)

f Chromium is compared to the RBC for hexavalent chromium.

g Lead lacks standard toxicity criteria and RBCs. A value of 400 mg/kg (protective of children) is used for screening purposes (USEPA 1994).

h Mercury is compared to the RBC for mercuric chloride.

i SSL is for cis-1,2-dichloroethylene.

NA Not available.

TABLE 7
SUMMARY OF CHEMICALS OF POTENTIAL CONCERN (COPC) SELECTION PROCESS
SLAG FILL AREA ZONE 2 - GROUNDWATER

Chemical	Number of Samples	Number of Detects	Detection Frequency	Maximum Detected Concentration (µg/L)	Region III Tap Water RBC[a] (µg/L)	NYSDEC Standard[b] (µg/L)	Human Health COPC?[c]
Volatiles							
1,1-Dichloroethane	191	103	54%	210	800	5	**Yes**
1,2-Dichloroethane	191	19	10%	300	0.12	0.6	**Yes**
1,2-Dichloroethene, total	10	3	30%	7.6	55	5	**Yes**
Benzene	248	210	85%	110,000	0.32	1	**Yes**
Carbon disulfide	24	5	21%	81	1,000	NA	No
Chlorobenzene	193	1	1%	1.4	110	5	No
Chloroform	191	1	0.5%	2.9	0.15	7	No
Dibenzofuran	3	3	100%	18	24	NA	No
Ethylbenzene	195	97	50%	53	1,300	5	**Yes**
2-Methylnaphthalene	3	3	100%	58	120	NA	No
Methylene chloride	187	14	7%	130	4.1	5	**Yes**
Pyridine	185	7	3.8%	250,000	37	50	No
Tetrachloroethene	187	1	0.5%	19	1.1	5	No
Toluene	191	137	72%	700	750	5	**Yes**
trans-1,2-Dichloroethene	181	6	3%	16	120	5	No
Trichloroethene	178	43	24%	31	1.6	5	**Yes**
Xylenes, Total	190	129	68%	1,000	12,000	5	**Yes**
Volatile Semivolatiles							
Acenaphthene	31	7	23%	4.4	370	20	No
Acenaphthylene	194	111	57%	91	370[d]	20[d]	**Yes**
Anthracene	194	25	13%	15	1,800	50	No
Fluorene	194	108	56%	100	240	50	**Yes**
Naphthalene	240	181	75%	3,500	6.5	10	**Yes**
Phenanthrene	194	118	61%	110	180[e]	50	**Yes**

a USEPA Region III Tapwater Risk Based Concentration (RBC; USEPA, 2000b).

b NYSDEC Ambient Water Quality Standard and Guidance value (NYSDEC, 1998).

c Chemical is a COPC if detection frequency exceeds 5.0%, and the maximum detected concentration exceeds the lower of the RBC or NYSDEC Standard.

d Screening values for acenaphthene are used as surrogate criteria for acenaphthylene.

e Screening value for pyrene used for phenanthrene.

NA Not available.

TABLE 8
REPRESENTATIVE CONCENTRATIONS[a] OF CHEMICALS OF POTENTIAL CONCERN (COPCs)
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Surface SWMU Material COPCs	Representative Concentration (mg/kg)	Subsurface SWMU Material COPCs	Representative Concentration (mg/kg)	Zone 2 Groundwater COPCs	Representative Concentration (mg/L)
Antimony	247	Arsenic	24	1,1-Dichloroethane	0.0084
Arsenic	15	Lead	893	1,2-Dichloroethane	0.0065
Chromium	299	Thallium	4.2	1,2-Dichloroethene (total)	0.0053
Lead	2,435	Acenaphthylene	46	Acenaphthylene	0.029
Thallium	2.9	Benzo(a)anthracene	3.2	Benzene	0.17
Benzo(a)anthracene	556[b]	Benzene	9.5	Ethylbenzene	0.010
Benzo(a)pyrene	330[b]	Benzo(a)pyrene	0.49	Fluorene	0.025
Benzo(b)fluoranthene	490[b]	Benzo(b)fluoranthene	2.0	Methylene Chloride	0.0065
Benzo(k)fluoranthene	150[b]	Benzo(g,h,i)perylene	0.38	Naphthalene	0.91
Chrysene	540[b]	Naphthalene	1,091[b]	Phenanthrene	0.030
Dibenz(a,h)anthracene	38	Phenanthrene	87	Toluene	0.034
Indeno(1,2,3-c,d)pyrene	210[b]			Trichloroethene	0.0068
				Xylenes, Total	0.13

[a] For data sets greater than 10, the 95% UCL is used as the representative concentration. For datasets with less than 10 samples, the maximum concentration is used.

[b] The representative concentration for this chemical exceeds the chemical's soil saturation limit.

TABLE 9
POTENTIAL EXPOSURE SCENARIOS[a]
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Potential Receptor Scenario	Exposure Media	Potential Pathway of Exposure
Future Commercial/Industrial Worker	Surface SWMU Material	vapor and particulate inhalation
		ingestion
		dermal contact
	Subsurface SWMU Material	ambient and indoor vapor inhalation
	Zone 2 Groundwater	ambient and indoor vapor inhalation
Current Non-BSC Commercial/Industrial Worker	Surface SWMU Material	particulate inhalation
	Subsurface SWMU Material	ambient vapor inhalation
Future Utility/Maintenance Worker	Surface SWMU Material	vapor and particulate inhalation
		ingestion
		dermal contact
	Subsurface SWMU Material	vapor and particulate inhalation
		ingestion
		dermal contact
	Zone 2 Groundwater	ambient vapor inhalation
Trespasser	Surface SWMU Material	vapor and particulate inhalation
		ingestion
		dermal contact
	Subsurface SWMU Material	ambient vapor inhalation
	Zone 2 Groundwater	ambient vapor inhalation
Future Construction Worker	Surface SWMU Material	vapor and particulate inhalation
		ingestion
		dermal contact
	Subsurface SWMU Material	vapor and particulate inhalation
		ingestion
		dermal contact
	Zone 2 Groundwater	ambient vapor inhalation
Future Marina Worker	Surface SWMU Material	particulate inhalation
	Subsurface SWMU Material	ambient vapor inhalation
Future Greenway User	Surface SWMU Material	particulate inhalation
	Subsurface SWMU Material	ambient vapor inhalation
Future Fenceline Resident	Surface SWMU Material	particulate inhalation
	Subsurface SWMU Material	ambient vapor inhalation
Present Fenceline Resident	Surface SWMU Material	particulate inhalation
	Subsurface SWMU Material	ambient vapor inhalation

a Potential exposure scenarios for SWMU SFA-1 are based on those determined in ID No. 2 (BSC 1999a) and the chemicals of potential interest determined in ID No. 1 (BSC 1998).

TABLE 10
TOXICITY CRITERIA FOR COPCs
REFERENCE DOSES (RfDs) AND SLOPE FACTORS (SFs)
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

		Noncarcinogenic Toxicity Criteria				Carcinogenic Toxicity Criteria				
Chemical	CAS	Oral RfD (mg/kg-d)	Source	Inhalation RfD (mg/kg-d)	Source	Weight of Evidence[a]	Oral SF $(mg/kg-d)^{-1}$	Source	Inhalation SF $(mg/kg-d)^{-1}$	Source
Inorganics										
Antimony	7440-36-0	4.00E-04	H	4.00E-04	R	--	--	--	--	--
Arsenic	7440-38-2	3.00E-04	I	--	--	A	1.50E+00	I	1.51E+01	I
Chromium	18540-29-9	3.00E-03	I	3.00E-05	I	A	--	--	4.10E+01	H
Lead[b]	7439-92-1	--	--	--	--	--	--	--	--	--
Thallium	7440-28-0	8.00E-05	I, thallium chloride	8.00E-05	R	--	--	--	--	--
Organics										
Acenaphthylene	83-32-9	6.00E-02	I, acenaphthene surrogate	6.00E-02	R	--	--	--	--	--
Benzene	71-43-2	3.00E-03	E	1.70E-03	E	A	5.50E-02	I	2.90E-02	I
Benzo(a)anthracene	56-55-3	--	--	--	--	B2	7.30E-01	E	3.10E-01	E
Benzo(a)pyrene	50-32-8	--	--	--	--	B2	7.30E+00	I	3.10E+00	E
Benzo(b)fluoranthene	205-99-2	--	--	--	--	B2	7.30E-01	E	3.10E-01	E
Benzo(k)fluoranthene	207-08-9	--	--	--	--	B2	7.30E-02	E	3.10E-02	E
Benzo(g,h,i)perylene	191-24-2	3.00E-02	I, pyrene surrogate	3.00E-02	R	--	--	--	--	--
Chrysene	218-09-9	--	--	--	--	B2	7.30E-03	E	3.10E-03	E
Dibenz(a,h)anthracene	53-70-3	--	--	--	--	B2	7.30E+00	E	3.10E+00	E
1,1-Dichloroethane	75-34-3	1.00E-01	H	1.40E-01	H	--	--	--	--	--
1,2-Dichloroethane	107-06-2	3.00E-02	H	1.40E-03	E	B2	9.10E-02	I	9.10E-02	I
1,2-Dichloroethene (total)	540-59-0	9.00E-03	H	9.00E-03	R	--	--	--	--	--
Ethylbenzene	100-41-4	1.00E-01	I	2.90E-01	I	--	--	--	--	--
Fluorene	86-73-7	4.00E-02	I	4.00E-02	R	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	--	B2	7.30E-01	E	3.10E-01	E

TABLE 10
TOXICITY CRITERIA FOR COPCs
REFERENCE DOSES (RfDs) AND SLOPE FACTORS (SFs)
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

		Noncarcinogenic Toxicity Criteria				Carcinogenic Toxicity Criteria				
Chemical	CAS	Oral RfD (mg/kg-d)	Source	Inhalation RfD (mg/kg-d)	Source	Weight of Evidence[a]	Oral SF $(mg/kg\text{-}d)^{-1}$	Source	Inhalation SF $(mg/kg\text{-}d)^{-1}$	Source
Methylene chloride	75-09-2	6.00E-02	I	8.60E-01	H	B2	7.50E-03	I	1.65E-03	I
Naphthalene	91-20-3	2.00E-02	I	9.00E-04	I	--	--	--	--	--
Phenanthrene	85-01-8	3.00E-02	I, pyrene surrogate	3.00E-02	R	--	--	--	--	--
Toluene	108-88-3	2.00E-01	I	1.14E-01	I	--	--	--	--	--
Trichloroethene	79-01-6	6.00E-03	E	--	--	NC	1.10E-02	E	6.00E-03	E
Xylenes, Total	1130-20-7	2.00E+00	I	2.00E+00	R	--	--	--	--	--

a Weight of Evidence: A - known human carcinogen, B2 - probable human carcinogen (sufficient animal/inadequate human evidence), NC - no classification at this time (USEPA 2000a).

b Lead lacks standard toxicity criteria and was evaluated alternatively using the Adult Lead Model (USEPA 1996a).

-- There is no toxicity criteria for this pathway.

E Obtained from the USEPA National Center for Environmental Assessment as obtained from the Region III RBC Tables (USEPA 2000b).

H Health Effects Assessment Summary Tables (HEAST) (USEPA 1997).

I Integrated Risk Information System (IRIS) online database (USEPA 2000a).

R Route to route extrapolation; in absence of inhalation RfD, oral RfD was used for volatile COPCs which do not have carcinogenic inhalation toxicity criteria.

TABLE 11
COMPARISON OF CHEMICALS OF POTENTIAL CONCERN (COPCs) TO RISK-BASED SCREENING LEVELS (RBSLs)
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Scenarios and COPCs	Representative Concentration	Cancer RBSL	Non-Cancer RBSL
Current Non-BSC Commercial/Industrial Worker *Inhalation of Particles from Uncovered SWMUs (mg/kg)*			
Antimony	247	--	>1,000,000
Arsenic	15	289,000	--
Chromium	299	>1,000,000	>1,000,000
Lead	2,435	--	NE
Thallium	2.9		>1,000,000
Acenaphthylene	200	--	>1,000,000
Benzo(a)anthracene	556	>1,000,000	--
Benzo(a)pyrene	330	>1,000,000	--
Benzo(b)fluoranthene	490	>1,000,000	--
Benzo(g,h,i)perylene	170	--	>1,000,000
Benzo(k)fluoranthene	150	>1,000,000	--
Chrysene	540	>1,000,000	--
Dibenz(a,h)anthracene	38	>1,000,000	--
Indeno(1,2,3-c,d)pyrene	210	>1,000,000	--
Phenanthrene	1,900	--	>1,000,000
Inhalation of Vapors from Subsurface SWMU material (mg/kg)			
Acenaphthylene	46	--	>1,000,000
Benzene	9.5	79	343
Naphthalene[b]	371	--	51,700
Phenanthrene	87	--	>1,000,000
Future Commercial/Industrial Worker *Direct Contact (including particulate inhalation) with Surficial SWMU Material (mg/kg)*			
Antimony	247	--	**50**
Arsenic	15	**12[a]**	37
Chromium	299	>1,000,000	373
Lead	2,435	--	**1545**
Thallium	2.9	--	10
Benzo(a)anthracene	556	**1.9**	--
Benzo(a)pyrene	330	**0.19**	--
Benzo(b)fluoranthene	490	**1.9**	--
Benzo(k)fluoranthene	150	**19**	--
Chrysene	540	**194**	--
Dibenz(a,h)anthracene	38	**0.19**	--
Indeno(1,2,3-c,d)pyrene	210	**1.9**	--

TABLE 11
COMPARISON OF CHEMICALS OF POTENTIAL CONCERN (COPCs) TO RISK-BASED SCREENING LEVELS (RBSLs)
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Scenarios and COPCs	Representative Concentration	Cancer RBSL	Non-Cancer RBSL
Inhalation of Ambient Vapors From Subsurface SWMU Material (mg/kg)			
Acenaphthylene	46	--	676,000
Benzene	9.5	**1.3**	**5**
Naphthalene[b]	371	--	**313**
Phenanthrene	87	--	> sat (163)
Inhalation of Indoor Vapors From Subsurface SWMU Material (mg/kg)			
Acenaphthylene	46	--	223,000
Benzene	9.5	**0.16**	**0.69**
Naphthalene[b]	371	--	**103**
Phenanthrene	87	--	> sat (163)
Inhalation of Ambient Vapors from Groundwater (mg/L)			
1,1-Dichloroethane	0.0084	--	> sol (5,060)
1,2-Dichloroethane	0.0065	18	202
1,2-Dichloroethene (total)	0.0053	--	417
Acenaphthylene	0.029	--	> sol (16.1)
Benzene	0.17	19	82
Ethylbenzene	0.0099	--	> sol (169)
Fluorene	0.026	--	> sol (2.0)
Methylene Chloride	0.0065	551	> sol (13,000)
Naphthalene	0.91	--	> sol (31)
Phenanthrene	0.030	--	> sol (1.15)
Toluene	0.034	--	> sol (526)
Trichloroethene	0.0068	63	--
Xylenes, Total	0.13	--	> sol (175)
Inhalation of Indoor Vapors from Groundwater (mg/L)			
1,1-Dichloroethane	0.0084	--	240
1,2-Dichloroethane	0.0065	0.68	8.0
1,2-Dichloroethene (total)	0.0053	--	13
Acenaphthylene	0.029	--	> sol (16.1)
Benzene	0.17	0.59	2.6
Ethylbenzene	0.0099	--	> sol (169)
Fluorene	0.026	--	> sol (2.0)
Methylene Chloride	0.0065	19	2412.00
Naphthalene	0.91	--	16
Phenanthrene	0.030	--	> sol (1.15)
Toluene	0.034	--	154
Trichloroethene	0.0068	1.9	--
Xylenes, Total	0.13	--	> sol (175)

TABLE 11
COMPARISON OF CHEMICALS OF POTENTIAL CONCERN (COPCs) TO RISK-BASED SCREENING LEVELS (RBSLs)
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Scenarios and COPCs	Representative Concentration	Cancer RBSL	Non-Cancer RBSL
Future Construction Worker *Direct Contact (including particulate inhalation) with Surficial SWMU Material (mg/kg)*			
Antimony	247	--	**129**
Arsenic	15	16	96
Chromium	299	>1,000,000	964
Lead	2,435	--	**1545**
Thallium	2.9	--	26
Benzo(a)anthracene	556	**33**	--
Benzo(a)pyrene	330	**3.3**	--
Benzo(b)fluoranthene	490	**33**	--
Benzo(k)fluoranthene	150	330	--
Future Construction Worker *Direct Contact (including particulate inhalation) with Surficial SWMU Material (mg/kg) cont.*			
Chrysene	540	3,300	--
Dibenz(a,h)anthracene	38	**3.3**	--
Indeno(1,2,3-c,d)pyrene	210	**33**	--
Direct Contact (including particulate and ambient vapor inhalation) with Subsurface SWMU Material (mg/kg)			
Arsenic	24	**16**	96
Lead	893	--	1,545
Thallium	4.2	--	26
Acenaphthylene	46	--	12,000
Benzo(a)anthracene	3.2	33	--
Benzene	9.5	30	21
Benzo(a)pyrene	0.49	3.3	--
Benzo(b)fluoranthene	2.0	33	--
Benzo(g,h,i)perylene	0.38	--	9,637
Naphthalene	1,091	--	**83**
Phenanthrene	87	--	6,910
Inhalation of Ambient Vapors from Groundwater (mg/L)			
1,1-Dichloroethane	0.0084	--	> sol (5,060)
1,2-Dichloroethane	0.0065	302	514
1,2-Dichloroethene (total)	0.0053	--	1,060
Acenaphthylene	0.029	--	> sol (16.1)
Benzene	0.17	318	209
Ethylbenzene	0.0099	--	> sol (169)
Fluorene	0.026	--	> sol (2.0)
Methylene Chloride	0.0065	9,260	> sol (13,000)
Naphthalene	0.91	--	> sol (31)
Phenanthrene	0.030	--	> sol (1.15)
Toluene	0.034	--	> sol (526)
Trichloroethene	0.0068	1,050	--
Xylenes, Total	0.13	--	> sol (175)

TABLE 11
COMPARISON OF CHEMICALS OF POTENTIAL CONCERN (COPCs) TO RISK-BASED SCREENING LEVELS (RBSLs)
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Scenarios and COPCs	Representative Concentration	Cancer RBSL	Non-Cancer RBSL
Future Utility/Maintenance Worker *Direct Contact (including particulate inhalation) with Surficial SWMU Material (mg/kg)*			
Antimony	247	--	554
Arsenic	15	69	416
Chromium	299	>1,000,000	8316
Lead	2,435	--	1545
Thallium	2.9	--	111
Benzo(a)anthracene	556	142	--
Benzo(a)pyrene	330	14	--
Benzo(b)fluoranthene	490	142	--
Benzo(k)fluoranthene	150	1,424	--
Chrysene	540	14,240	--
Future Utility/Maintenance Worker *Direct Contact (including particulate inhalation) with Surficial SWMU Material (mg/kg) cont.*			
Dibenz(a,h)anthracene	38	14	--
Indeno(1,2,3-c,d)pyrene	210	142	--
Phenanthrene	1,900	--	31,000
Direct Contact (including particulate and ambient vapor inhalation) with Subsurface SWMU Material (mg/kg)			
Arsenic	24	69	416
Lead	893	--	1,545
Thallium	4.2	--	111
Acenaphthylene	46	--	54,600
Benzo(a)anthracene	3.2	142	--
Benzene	9.5	149	104
Benzo(a)pyrene	0.49	14	--
Benzo(b)fluoranthene	2.0	142	--
Benzo(g,h,i)perylene	0.38	--	41,581
Naphthalene	1,091	--	414
Phenanthrene	87	--	31,000
Inhalation of Ambient Vapors from Groundwater (mg/L)			
1,1-Dichloroethane	0.0084	--	> sol (5,060)
1,2-Dichloroethane	0.0065	1,510	2,570
1,2-Dichloroethene (total)	0.0053	--	> sol (4,900)
Acenaphthylene	0.029	--	> sol (16.1)
Benzene	0.17	1,590	1,040
Ethylbenzene	0.0099	--	> sol (169)
Fluorene	0.026	--	> sol (2.0)
Methylene Chloride	0.0065	> sol (13,000)	> sol (13,000)
Naphthalene	0.91	--	> sol (31)
Phenanthrene	0.030	--	> sol (1.15)
Toluene	0.034	--	> sol (526)
Trichloroethene	0.0068	> sol (1,100)	--
Xylenes, Total	0.13	--	> sol (175)

TABLE 11
COMPARISON OF CHEMICALS OF POTENTIAL CONCERN (COPCs) TO RISK-BASED SCREENING LEVELS (RBSLs)
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Scenarios and COPCs	Representative Concentration	Cancer RBSL	Non-Cancer RBSL
Trespasser *Direct Contact with Surficial SWMU Material (mg/kg)*			
Antimony	247	--	6,780
Arsenic	15	212	5,080
Chromium	299	>1,000,000	50,779
Lead	2,435	--	**1545**
Thallium	2.9	--	1,354
Benzo(a)anthracene	556	**435**	--
Benzo(a)pyrene	330	**44**	--
Benzo(b)fluoranthene	490	**435**	--
Benzo(k)fluoranthene	150	4,350	--
Chrysene	540	43,476	--
Dibenz(a,h)anthracene	38	44	--
Trespasser *Direct Contact with Surficial SWMU Material (mg/kg) cont.*			
Indeno(1,2,3-c,d)pyrene	210	435	--
Inhalation of Vapors from Subsurface SWMU material (mg/kg)			
Acenaphthylene	46	--	>1,000,000
Benzene	9.5	319	839
Naphthalene[b]	371	--	79,400
Phenanthrene	87	--	>1,000,000
Inhalation of Ambient Vapors from Groundwater (mg/L)			
1,1-Dichloroethane	0.0084	--	> sol (5,060)
1,2-Dichloroethane	0.0065	7,530	> sol (8,520)
1,2-Dichloroethene (total)	0.0053	--	> sol (4,900)
Acenaphthylene	0.029	--	> sol (16.1)
Benzene	0.17	> sol (1,750)	> sol(1,750)
Ethylbenzene	0.0099	--	> sol (169)
Fluorene	0.026	--	> sol (2.0)
Methylene Chloride	0.0065	> sol (13,000)	> sol (13,000)
Naphthalene	0.91	--	> sat (371)
Phenanthrene	0.030	--	> sol (1.15)
Toluene	0.034	--	> sol (526)
Trichloroethene	0.0068	> sol (1,100)	--
Xylenes, Total	0.13	--	> sol (175)

TABLE 11
COMPARISON OF CHEMICALS OF POTENTIAL CONCERN (COPCs) TO RISK-BASED SCREENING LEVELS (RBSLs)
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Scenarios and COPCs	Representative Concentration	Cancer RBSL	Non-Cancer RBSL
Future Marina Worker			
Inhalation of Particles from Uncovered SWMUs (mg/kg)			
Antimony	247	--	>1,000,000
Arsenic	15	370,000	--
Chromium	299	136,000	>1,000,000
Lead	2,435	--	NE
Thallium	2.9	--	>1,000,000
Acenaphthylene	200	--	>1,000,000
Benzo(a)anthracene	556	>1,000,000	--
Benzo(a)pyrene	330	>1,000,000	--
Benzo(b)fluoranthene	490	>1,000,000	--
Benzo(g,h,i)perylene	170	--	>1,000,000
Benzo(k)fluoranthene	150	>1,000,000	--
Chrysene	540	>1,000,000	--
Dibenz(a,h)anthracene	38	>1,000,000	--
Indeno(1,2,3-c,d)pyrene	210	>1,000,000	--
Phenanthrene	1,900	--	>1,000,000
Inhalation of Vapors from Subsurface SWMU material (mg/kg)			
Acenaphthylene	46	--	>1,000,000
Benzene	9.5	21	90
Naphthalene[b]	371	--	13,600
Phenanthrene	87	--	>1,000,000
Future Greenway User			
Inhalation of Particles from Uncovered SWMUs (mg/kg)			
Antimony	247	--	>1,000,000
Arsenic	15	872,000	--
Chromium	299	321,000	>1,000,000
Lead	2,435	--	NE
Thallium	2.9	--	>1,000,000
Acenaphthylene	200	--	>1,000,000
Benz(a)anthracene	556	>1,000,000	--
Benzo(a)pyrene	330	>1,000,000	--
Benzo(b)fluoranthene	490	>1,000,000	--
Benzo(g,h,i)perylene	170	--	>1,000,000
Benzo(k)fluoranthene	150	>1,000,000	--
Chrysene	540	>1,000,000	--
Dibenz(a,h)anthracene	38	>1,000,000	--
Indeno(1,2,3-c,d)pyrene	210	>1,000,000	--
Phenanthrene	1,900	--	>1,000,000
Inhalation of Vapors from Subsurface SWMU material (mg/kg)			
Acenaphthylene	46	--	>1,000,000
Benzene	9.5	49	967
Naphthalene[b]	371	--	146,000
Phenanthrene	87	--	>1,000,000

TABLE 11
COMPARISON OF CHEMICALS OF POTENTIAL CONCERN (COPCs) TO RISK-BASED SCREENING LEVELS (RBSLs)
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

Scenarios and COPCs	Representative Concentration	Cancer RBSL	Non-Cancer RBSL
Present/Future Fenceline Resident *Inhalation of Particles from Uncovered SWMUs (mg/kg)*			
Antimony	247	--	>1,000,000
Arsenic	15	33,100	--
Chromium	299	12,200	>1,000,000
Lead	2,435	--	NE
Thallium	2.9	--	>1,000,000
Acenaphthylene	200	--	>1,000,000
Benzo(a)anthracene	556	>1,000,000	--
Benzo(a)pyrene	330	161,000	--
Benzo(b)fluoranthene	490	818,000	--
Benzo(g,h,i)perylene	170	--	>1,000,000
Benzo(k)fluoranthene	150	>1,000,000	--
Chrysene	540	>1,000,000	--
Dibenz(a,h)anthracene	38	161,000	--
Indeno(1,2,3-c,d)pyrene	210	>1,000,000	--
Phenanthrene	1,900	--	>1,000,000
Inhalation of Vapors from Subsurface SWMU material (mg/kg)			
Acenaphthylene	46	--	>1,000,000
Benzene	9.5	22	434
Naphthalene[b]	371	--	65,400
Phenanthrene	87	--	>1,000,000

a	The RBSL for arsenic is less than the background, therefore, the background was used as the RBSL.
b	The representative concentration for this chemical exceeds the chemical's saturation limit (C_{sat}) in soil. As C_{sat} is the concentration at which maximum emissions occur, and inhalation is the only pathway for this scenario, the representative concentration defaulted to the C_{sat}.
--	Not evaluated as there is no toxicity criteria for this pathway.
> Sol	The RBSL exceeds the solubility limit in this medium, indicated in parentheses.
> Sat	The RBSL exceeds the saturation limit in this medium, indicated in parentheses.
▨	Shaded cell indicates value exceeds the RBSL.
>1,000,000	Calculated RBSL is greater than 1,000,000 parts per million (mg/kg or mg/L).
NE	Not evaluated for this scenario.

TABLE 12
TIER I RISK ASSESSMENT RESULTS
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

	Representative Concentration (mg/kg)	**Cancer RBSL (mg/kg)**	**Screening Level Cancer Risk (SLCR)**	**Non-Cancer RBSL (mg/kg)**	**Screening Level Hazard Quotient (SLHQ)**	**Primary Target Organ[a]**
			FUTURE COMMERCIAL/INDUSTRIAL WORKER			
Direct Contact with Surficial SWMU Material						
Antimony	247	NA	NA	50	4.9	blood
Arsenic[b]	15.1	0.94	1.6E-05	NA	NA	NA
Lead[c]	2435	NE	NE	NE	NE	NE
Benzo(a)anthracene[d]	556	1.9	2.9E-04	NA	NA	NA
Benzo(a)pyrene[d]	330	0.19	1.7E-03	NA	NA	NA
Benzo(b)fluoranthene[d]	490	1.9	2.6E-04	NA	NA	NA
Benzo(k)fluoranthene[d]	150	19	7.9E-06	NA	NA	NA
Chrysene[d]	540	194	2.8E-06	NA	NA	NA
Dibenz(a,h)anthracene	38	0.19	2.0E-04	NA	NA	NA
Indeno(1,2,3-c,d)pyrene[d]	210	1.9	1.1E-04	NA	NA	NA
Total			**3E-03**		**4.9**	
Inhalation of Ambient Vapors from Subsurface SWMU material						
Benzene	9.5	1.3	7.3E-06	5.5	1.7	blood/immune system
Naphthalene[d]	371[e]	NA	NA	313	1.2	upper respiratory system
Total			**7E-06**		**2.9**	
Inhalation of Indoor Vapors from Subsurface SWMU material						
Benzene	9.5	0.16	5.9E-05	0.69	13.8	blood/immune system
Naphthalene[d]	371[e]	NA	NA	103	3.6	upper respiratory system
Total			**6E-05**		**17**	
					Ambient	Indoor
Total across all pathways:		Ambient $SLCR_{total}$ =	**3E-03**	Total SLHI=	**7.9**	**22**
		Indoor $SLCR_{total}$ =	**3E-03**	Total blood/immune system SLHI=	**6.7**	**18.7**
				Total upper respiratory system SLHI=	**1.2**	**3.6**

TABLE 12
TIER I RISK ASSESSMENT RESULTS
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

	Representative Concentration (mg/kg)	Cancer RBSL (mg/kg)	Screening Level Cancer Risk (SLCR)	Non-Cancer RBSL (mg/kg)	Screening Level Hazard Quotient (SLHQ)	Primary Target Organ[a]
FUTURE CONSTRUCTION WORKER						
Direct Contact with Surficial SWMU Material						
Antimony	247	NA	NA	129	1.9	blood
Lead[c]	2435	NE	NE	NE	NE	NE
Benzo(a)anthracene[d]	556	33	1.7E-05	NA	NA	NA
Benzo(a)pyrene[d]	330	3.3	1.0E-04	NA	NA	NA
Benzo(b)fluoranthene[d]	490	33	1.5E-05	NA	NA	NA
Dibenz(a,h)anthracene	38	3.3	1.2E-05	NA	NA	NA
Indeno(1,2,3-c,d)pyrene[d]	210	33	6.4E-06	NA	NA	NA
Total			**1E-04**		**1.9**	
Direct Contact with Subsurface SWMU Material						
Arsenic[b]	24	16	1.5E-06	NA	NA	NA
Naphthalene[d]	1,091	NA	NA	83	13.1	system
Total			**2E-06**		**13.1**	
Total across all pathways:		$SLCR_{total}$ =	**2E-04**	Total SLHI=	**15.1**	
				Total blood/immune system SLHI=	**1.9**	
				Total upper respiratory system SLHI=	**13.1**	
FUTURE UTILITY/MAINTENANCE WORKER						
Direct Contact with Surficial SWMU Material						
Lead[c]	2435	NE	NE	NE	NE	NE
Benzo(a)anthracene[d]	556	142	3.9E-06	NA	NA	NA
Benzo(a)pyrene[d]	330	14.0	2.4E-05	NA	NA	NA
Benzo(b)fluoranthene [d]	490	142	3.5E-06	NA	NA	NA
Dibenz(a,h)anthracene	38	14.0	2.7E-06	NA	NA	NA
Indeno(1,2,3-c,d)pyrene[d]	210	142	1.5E-06	NA	NA	NA
Total			**4E-05**		**NE**	
Direct Contact with Subsurface SWMU Material						
Naphthalene[d]	1,091	NA	NA	414	2.6	system
Total			**NA**		**2.6**	
					Ambient	
Total across all pathways:		Ambient $SLCR_{total}$=	**4E-05**	Total SLHI=	**2.6**	
				Total upper respiratory system SLHI=	**2.6**	

TABLE 12
TIER I RISK ASSESSMENT RESULTS
SWMU GROUP SFA-1
(SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27)

	Representative Concentration (mg/kg)	Cancer RBSL (mg/kg)	Screening Level Cancer Risk (SLCR)	Non-Cancer RBSL (mg/kg)	Screening Level Hazard Quotient (SLHQ)	Primary Target Organ[a]
TRESPASSER						
Direct Contact with Surficial SWMU Material						
Lead[c]	2435	NE	NE	NE	NE	NE
Benzo(a)anthracene[d]	556	435	1.3E-06	NA	NA	NA
Benzo(a)pyrene[d]	330	44	7.5E-06	NA	NA	NA
Benzo(b)fluoranthene[d]	490	435	1.1E-06	NA	NA	NA
		$SLCR_{total}$ =	**1E-05**	SLHI=	**NA**	

a Primary Target Organ information obtained from IRIS (USEPA, 2000).
b Screening level for arsenic based on risk. The background value is 12 mg/kg.
c The lead RBSL (1,545 mg/kg) for this scenario is exceeded by the representative concentration. Lead RBSL calculated using Adult Lead Model (USEPA 1996c). As lead is evaluated as neither a carcinogen nor a noncarcinogen, this exceedances is noted here.
d The representative concentration for this chemical exceeds the chemical's saturation limit.
NA Not applicable as chemical does not exceed the RBSL for this effect, or no toxicity criteria exists for this pathway.
NE Not evaluated as there is no toxicity criteria for this pathway.
SLHI Screening Level Hazard Index.
SLCR Screening Level Cancer Risk.

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

SWMU INSPECTION REPORT

SWMU S-1

DATE 4/11/01 10:00

DAY	S	M	T	[✓ W]	TH.	F	S

PROJECT BSC - Lackawanna, NY
OWNER BSC Corp
CONTRACT No. 42 00008 BSC.15
URS CORP JOB No. 42-00008BSC.15 20000
URS CORP PROJECT MANAGER J. Jacobi

WEATHER	Bright Sun	Clear	[✓ Overcast]	Rain	Snow
TEMP	To 32	32-50	50-70 50°F	70-85	85 up
WIND	[✓ Still]	Moder	High	Report No.	
HUMIDITY	Dry	[✓ Moder]	Humid		

Name of Contractor	Non-manual	Manual	Remarks

VISITORS

Time	Representating	Representating	Remarks

EQUIPMENT AT THE SITE None

Inspectors: M Colmerauer, T. Burmeier

INSPECTION NOTES Elevated perimeter berm (3'-8') with vehicle access around most of the site. One area with truck access into pit on SW portion; from pilot study. The pit is 7-10 feet below level of berm. Pit contains black oily sludge which has been moved to the south end of the pit. There is ponded water along the north end of the pit. The water has a sheen on the surface. Water covers about 40%-50% of the pit. There is scattered debris on the surface of the sludge with petroleum odor. There is a small trailer at the north end of the SWMU. Photos were taken. The perimeter has sumac shrubs but no vegetation in the interior of pit. The berm consists of slag, soil, brick and steel debris. No drainage observed leaving the pit

sketch map on next page

SHEET ______ OF ______

BY ______________________ TITLE ______________________

REVIEWED BY: ______________________ PROJECT ENGINEER

URSF-011/1 OF 3/GDCONREP

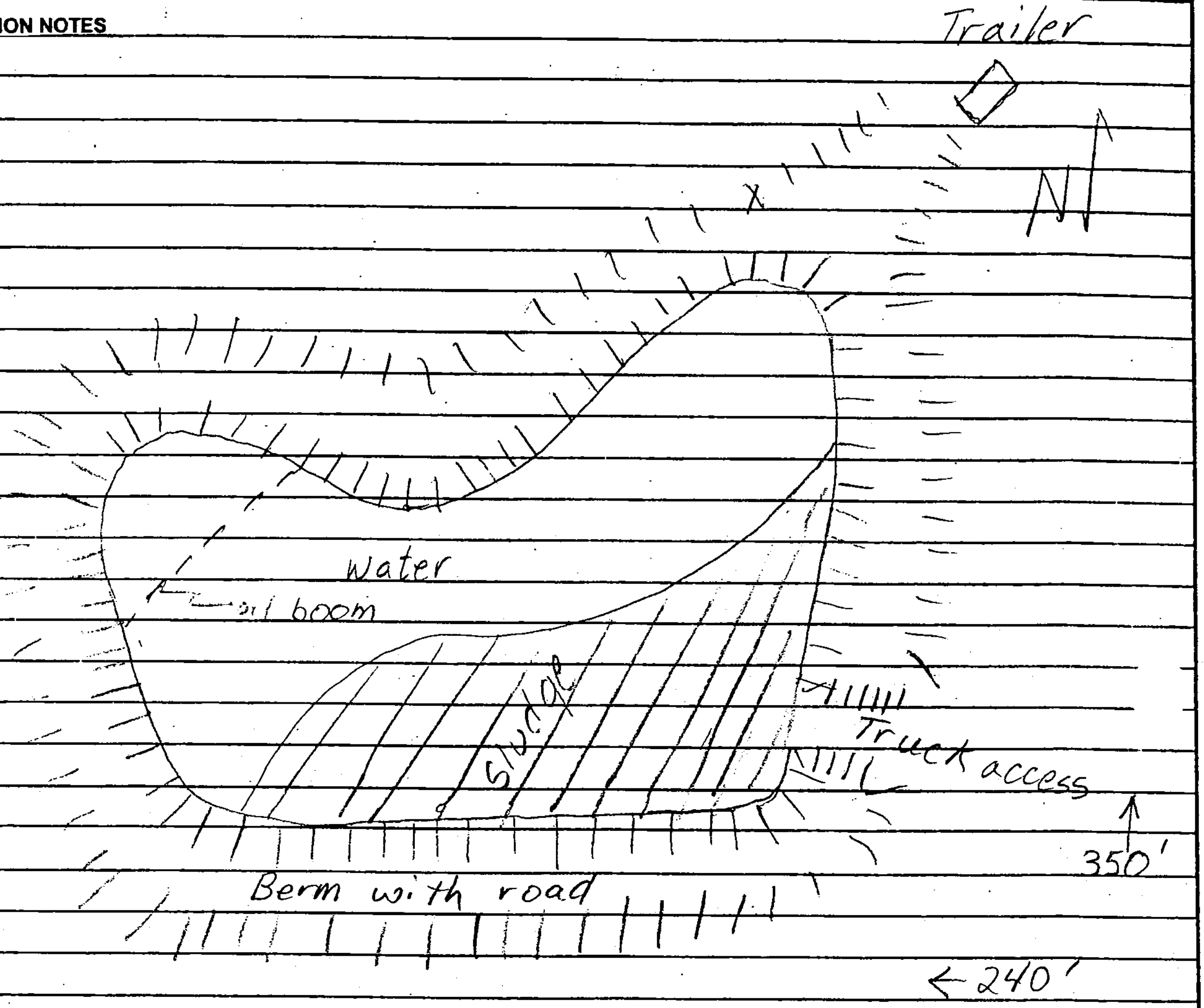
S-1

SWMU INSPECTION REPORT (cont'd)

PROJECT BSC - Lackawanna NY
URS CORP JOB No. 420·0008 BSC, 15

REPORT No.
DATE 4/11/01

INSPECTION NOTES



SHEET ____ OF ____

BY ____ TITLE ____

REVIEWED BY: ____ PROJECT ENGINEER

URSF-011/2 OF 3/GDCONREP

FIELD INSPECTION CHECKLIST
SWMU SURFACE WATER RUNOFF POTENTIAL EVALUATION
BETHLEHEM STEEL CORPORATION
LACKAWANNA, NEW YORK

SWMU #: S-1

SWMU Name: Surface Impoundment A.

Date of Inspection: 9/5/96

Inspector(s): J. Hannon

TYPE OF SWMU (check type and configuration and add comments):

Type:

______ Landfill   X Impoundment

______ Pit/sump/trench   ______ Pile

Configuration:

______ Level
______ Above Grade - height ______ ft
✓ Depression depth 2.5 ft
______ Interior trench/pit/sump width ______ feet, length ______ ft, depth ______ ft, height of top above grade ______ ft
______ Free board 2.5 ft At ~~[illegible]~~ dumping area Ave. 5' elsewhere
______ Other (describe) ______

Comments: Surface Impoundment with water on surface, oil sheen on water
BLACK powdery mill scale

SWMU# S-1

Inspection Date: 9/5/96

SURFACE OF SWMU (check all that apply and add comments):

Material:

_______ Concrete/Asphalt
_______ Grass
_______ Slag
_______ Other (describe):________________________________

___X___ Trees/Shrubs on Berm
___✓___ Liquid w/sheen
_______ Unvegetated Soil

Comments: The site is partially covered with water with an oil sheen

SURROUNDING AREA (Attach topography map and indicate features of interest, check all that apply and add comments):

Features:

_______ Buildings, direction________, distance ___________ ft
_______ Road, type _______________, direction __________, distance ___________ ft
_______ Railroad, direction _________, distance ___________ ft
_______ Other (describe): On plateau w/ S-27, S-5, S-2
Slag processing Area 1500 FT South

Ground Surface:

_______ Concrete/Asphalt
_______ Grass
___X___ Slag
_______ Other (describe):

_______ Unvegetated Soil
___X___ Trees/Shrubs
_______ Liquid

The containment dike is vegetated with dense weeds.

SWMU# S-1

Inspection Date: 9/5/96

Comments:

Surrounding topography:

X Level

___ Sloped to ______ at ______ ft (vertical) per feet (horizontal)

Comments: About 150 FT south @ S-27 ground slops down about 30 FT. Then 200 feet south to edge of slag processing area. LAke Erie to west with slope > 25%

CONTAINMENT SYSTEM (check all that apply and add comments):

___ Cover - type None
___ Concrete sump/pit
___ Concrete trench
___ Wooden trench
___ Berm or dike Are
height 5 ft
width 2 ft at crest
width 22 ft at base

Comments: The dumping area is about 2.5' from the waste to the dump berm. Otherwise the site is completely contained

DISTANCE TO NEAREST SURFACE WATER BODY: 180 ft, direction W

Name of water body: LAKE Erie

SWMU# S-1

Inspection Date: 9/5/96

VISUAL EVIDENCE OF RUN ON

✓ No

____ Yes, Description:

VISUAL EVIDENCE OF RUN OFF:

✓ No

____ Yes, Description:

If Yes, which of following are present?

____ Erosion scars on SWMU

____ Sediments near SWMU in runoff areas

____ Staining in SWMU runoff areas

____ Distressed vegetation in SWMU runoff areas

DOES RUNOFF REACH SURFACE WATER BODY? NO

If yes, provide description:

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

SWMU INSPECTION REPORT

SWMU-S2

DATE 4/11/01 - 10:20

DAY	S	M	T	W ☒	TH	F	S

PROJECT BSC Lackawanna NY
OWNER BSC Corp
CONTRACT No. 4200008 BSC.15
URS CORP JOB No. 4200008 BSC.15 20000
URS CORP PROJECT MANAGER J. Jacobi

WEATHER	Bright Sun	Clear	Overcast ☒	Rain	Snow
TEMP	To 32	32-50	50-70 ☒ 50°F	70-85	85 up
WIND	Still ☒	Moder	High	Report No.	
HUMIDITY	Dry	Moder ☒	Humid		

Name of Contractor	Non-manual	Manual	Remarks

VISITORS

Time	Representating	Representating	Remarks

EQUIPMENT AT THE SITE None

Inspectors: M. Colmerauer, T. Burmeier

INSPECTION NOTES Berm, approximately 375' by 240' with vehicle access, approximately 3' to 8' high around perimeter. Interior is flat, 3 to 6' below top of berm. The central area is about 30' by 80' and has no vegetation with brown iron rich soil. The remainder of the pit (70%) has grass, shrubs and several trees with scattered debris. Any water drain to the center of the pit, with no containment or standing water. The berm has piles along road, as shown in the sketch map. Photos were taken. The trailer noted in the report on SWMU S-1 at SE corner

SHEET ______ OF ______

BY ______________________ TITLE ______________________

REVIEWED BY: ______________________ PROJECT ENGINEER

S-2

SWMU INSPECTION REPORT (cont'd)

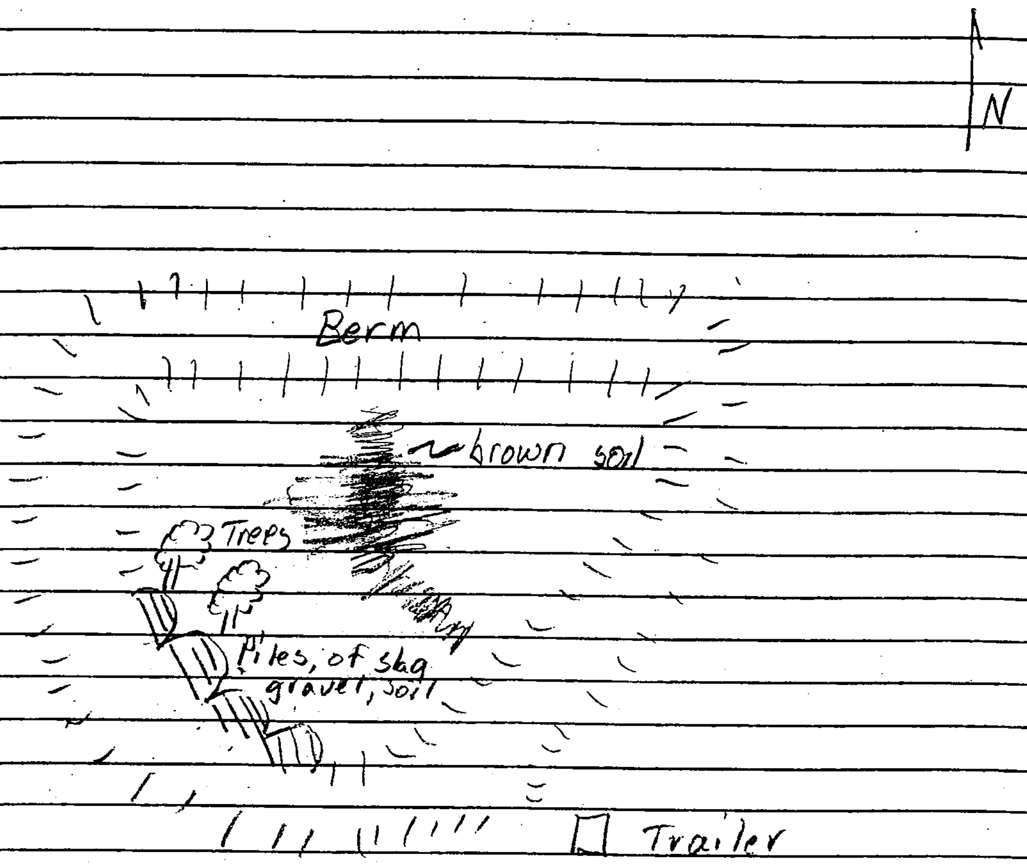
PROJECT BSC Lackawanna, NY

URS CORP JOB No. 4200008 BSC, 15

REPORT No.

DATE 4/11/01

INSPECTION NOTES



SHEET ____ OF ____

BY ____ TITLE ____

REVIEWED BY: ____ PROJECT ENGINEER

URSF-011/2 OF 3/GDCONREP

FIELD INSPECTION CHECKLIST
SWMU SURFACE WATER RUNOFF POTENTIAL EVALUATION
BETHLEHEM STEEL CORPORATION
LACKAWANNA, NEW YORK

SWMU #: S-2

SWMU Name: Surface Impoundment B

Date of Inspection: 9/5/96

Inspector(s): J. Harmon

TYPE OF SWMU (check type and configuration and add comments):

Type:

______ Landfill

X Impoundment

______ Pit/sump/trench

______ Pile

Configuration:

____________ Level

____________ Above Grade - height__________ ft

X Depression depth 6 ft

____________ Interior trench/pit/sump width _____ feet, length_________ ft, depth________ ft, height of top above grade_____________ft

____________ Free board_________ft

____________ Other (describe)________________________________

Comments: Redish Brown Sand & silt size powdered sludge no water on surface, No Berm on eastern side however it appears to Be upslope of pond which will allow runoff into pond but will contain dry waste in the pond

SWMU# S-2

Inspection Date: 9/5/96

SURFACE OF SWMU (check all that apply and add comments):

Material:

______ Concrete/Asphalt
______ Grass
______ Slag
__X__ Other (describe): Waste some vegetation

______ Unvegetated Soil
______ Trees/Shrubs
______ Liquid

Comments: Site has redish Brown sludge and is Approx. 50-60% vegetated by weeds

SURROUNDING AREA (Attach topography map and indicate features of interest, check all that apply and add comments):

Features:

______ Buildings, direction ______, distance ______ ft
__✓__ Road, type Access, direction WSEW, distance 15 ft
__✓__ Railroad, direction ______, distance ______ ft
______ Other (describe): Lake Erie 160 W
Pliteau with S-1, S-3, S-7/20,

Ground Surface:

______ Concrete/Asphalt
______ Grass
__X__ Slag
______ Other (describe): This unit is on a slag/Fill Area with moderate to heavy vegetation on Berms and waste surface

______ Unvegetated Soil
__X__ Trees/Shrubs
______ Liquid

SWMU# S-2

Inspection Date: 9/5/96

Comments:

Surrounding topography:

X Level

______ Sloped to _________ at __________ ft (vertical) per feet (horizontal)

Comments: Adjacent to S-1, S-5, S-7/10; S-3 on the plateau adjacent (160FT) to Lake Erie

CONTAINMENT SYSTEM (check all that apply and add comments):

______ Cover - type none

______ Concrete sump/pit

______ Concrete trench

______ Wooden trench

X Berm or dike Average 2-3 FT min

height____________ ft

width____________ ft at crest

width____________ ft at base

Comments: NO Berm on western edge

DISTANCE TO NEAREST SURFACE WATER BODY: 160 ft, direction W

Name of water body: Lake Erie

SWMU# S-2

Inspection Date: 9/5/96

VISUAL EVIDENCE OF RUN ON

X No

_____ Yes, Description: __________

VISUAL EVIDENCE OF RUN OFF:

X No

_____ Yes, Description: __________

If Yes, which of following are present?

_____ Erosion scars on SWMU

_____ Sediments near SWMU in runoff areas

_____ Staining in SWMU runoff areas

_____ Distressed vegetation in SWMU runoff areas

DOES RUNOFF REACH SURFACE WATER BODY? No

If yes, provide description: __________

SWMU# S2

Inspection Date: 9/5/96

PHOTO LOG

Direction	Description	
[✓ N] E S W	Waste surface - north	1
N E [✓ S] W	waste surface - south	2
[✓ N] E S W	mound of waste on site	3
N E S [✓ W]	low spot on Berm	4
N E S W		
N E S W		
N E S W		
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SWMU INSPECTION REPORT

SWMU S-4

DATE 8/28/00

DAY	S	M	T	W.	TH	F	S
		X					

PROJECT BSC -LACKAWANNA RFI
OWNER BSC
CONTRACT No.
URS CORP JOB No. 6200008BSC.15
URS CORP PROJECT MANAGER J. Jacobi

WEATHER	[✓ Bright Sun]	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	[✓ 70-85]	85 up
WIND	Still	[✓ Moder]	High	Report No.	
HUMIDITY	Dry	[✓ Moder]	Humid		

AVERAGE FIELD FORCE

Name of Contractor	Non-manual	Manual	Remarks

VISITORS

Time	Representating	Representating	Remarks
3:30 pm	M. Colmerauer	URS Corp.	

EQUIPMENT AT THE SITE

~~CONSTRUCTION ACTIVITIES~~ Site Observations:

SWMU S-4 is located within the shoreline surface impoundments south of Smoke Creek. The SWMU is surrounded by gravel access roads. Further north is Smokes Creek, further west is Lake Erie, further south is SWMU-3 and further east is SWMU S-8.

- The SWMU is contained by the gravel access roads which surround it, ~~the~~ the surface is an estimated 20 feet below the surroundg roads and is extremely vegitated with thick brush and tall trees.

- Both Lake Erie and Smokee Creek are approximitly 40 to 50 feet below the access road elevation (i.e. 20 to 30 feet below the SWMU surface)

SHEET 1 OF

BY Mark Colmerauer TITLE Geologist

REVIEWED BY: ____________ PROJECT ENGINEER

SWMU INSPECTION REPORT (cont'd)

PROJECT BSC Lackawanna RFI

URS CORP JOB No. 42 00008BSC.15

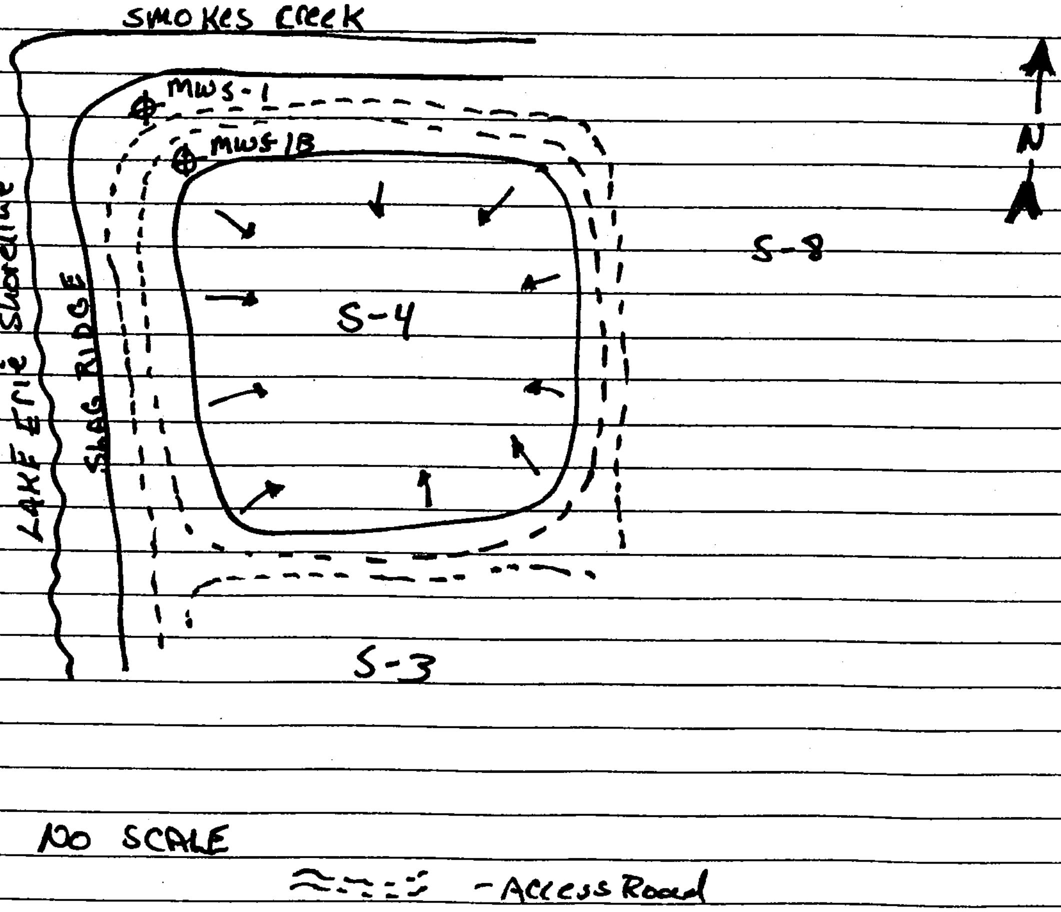
REPORT No.

DATE 8/28/00

CONSTRUCTION ACTIVITIES (cont'd) SWMU S-4

- There is no visible surface water although visibility is limited by the vegitation.
- All surface water will be contained within the SWMU where it is either absorbed by vegitation or infiltrates through the SWMU surface.

Sketch:



SHEET 2 OF 2

BY Mark Colmerauer TITLE Geologist

REVIEWED BY: PROJECT ENGINEER

FIELD INSPECTION CHECKLIST
SWMU SURFACE WATER RUNOFF POTENTIAL EVALUATION
BETHLEHEM STEEL CORPORATION
LACKAWANNA, NEW YORK

SWMU #: S-4

SWMU Name: Surface Impoundment D

Date of Inspection: 9/5/96

Inspector(s): J. HANNAN

TYPE OF SWMU (check type and configuration and add comments):

Type:

______ Landfill

X Impoundment

______ Pit/sump/trench

______ Pile

Configuration:

______ Level
______ Above Grade - height______ ft
X Depression depth 35 ft
______ Interior trench/pit/sump width ____ feet, length______ ft, depth______ ft, height of top above grade______ ft
______ Free board 35 ft
______ Other (describe)______

Comments: Site is densely vegitated with 4"-6"ϕ trees and ground cover. The site is contained with Freeboard of about 35' along the perimeter.

SWMU# S-4

Inspection Date: 9/5/96

SURFACE OF SWMU (check all that apply and add comments):

Material:

______ Concrete/Asphalt
__✓__ Grass
______ Slag
______ Other (describe):

______ Unvegetated Soil
__✓__ Trees/Shrubs
______ Liquid

Comments: Dense trees AND ground cover

SURROUNDING AREA (Attach topography map and indicate features of interest, check all that apply and add comments):

Features:

______ Buildings, direction ________, distance __________ ft
______ Road, type ______________, direction _________, distance __________ ft
______ Railroad, direction ________, distance __________ ft
__✓__ Other (describe): LAke Erie 800' W ; Smokes Creek 120 FT. North

Ground Surface:

______ Concrete/Asphalt
______ Grass
__✓__ Slag
______ Other (describe):

______ Unvegetated Soil
__✓__ Trees/Shrubs
______ Liquid

SWMU# S-4

Inspection Date: 9/5/96

Comments:

Surrounding topography:

_____ Level

✓ Sloped to 10B H at 1V ft (vertical) per feet (horizontal) At slope to Lake

Comments: Site is on plateau about 55 FT above Lake Erie. It is adjacent to S-3, S-7 and S-8 Dike elevation about 631. Smokes Creek to north

CONTAINMENT SYSTEM (check all that apply and add comments):

_____ Cover - type None dense vegitation

_____ Concrete sump/pit

_____ Concrete trench

_____ Wooden trench

X Berm or dike

height 1'-5' ft

width 0 ft at crest

width 3-15 ft at base

Comments: Berm is along road which completely surrounds site. Site has no runon from adjacent areas

DISTANCE TO NEAREST SURFACE WATER BODY: 120 ft, direction N

Name of water body: Smokes Creek

SWMU# S-4

Inspection Date: 9/5/96

VISUAL EVIDENCE OF RUN ON

✓ No

______ Yes, Description:

VISUAL EVIDENCE OF RUN OFF:

✓ No

______ Yes, Description: Pipe from/to SWMU S-8 shown on east side of dike not visible on S-8 side of dike

If Yes, which of following are present?

______ Erosion scars on SWMU

______ Sediments near SWMU in runoff areas

______ Staining in SWMU runoff areas

______ Distressed vegetation in SWMU runoff areas

DOES RUNOFF REACH SURFACE WATER BODY? NO

If yes, provide description:

SWMU# S-4

Inspection Date: 9/5/96

PHOTO LOG

Direction	Description	
[✓ N] E S [✓ W]	NW of site showing Smokes Creek discharge to Lake E	1
[✓ N] E S W	Dike Between Site AND LAKE Erie	2
N [✓ E] S W	Trees growing on site	3
N [✓ E] [✓ S] W	SE Corner of Site	4
N [✓ E] S W	North side dike	5
N E S [✓ W]	East dike showing 10"ϕ pipe which	6
N E S W	doesn't go through to S-8 to east.	
N E S W		
N E S W		
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SWMU INSPECTION REPORT

SWMU S5

DATE 4/11/01 - 12:00

DAY S M T [✓ W] TH. F S

PROJECT BSC - Lackawanna NY
OWNER BSC Corp
CONTRACT No. 4200008BSC.15
URS CORP JOB No. 4200008BSC.15 20000
URS CORP PROJECT MANAGER J. Jacobi

WEATHER: Bright Sun / Clear / [✓ Overcast] / Rain / Snow
TEMP: To 32 / 32-50 / [✓ 50-70] 50°F / 70-85 / 85 up
WIND: [✓ Still] / Moder / High
HUMIDITY: Dry / [✓ Moder] / Humid
Report No.

Name of Contractor	Non-manual	Manual	Remarks

VISITORS

Time	Representating	Representating	Remarks

EQUIPMENT AT THE SITE None

Inspectors: M. Colmerauer, T. Burmeier

INSPECTION NOTES S-5 is an elongated pit, approximately 200' by 350' with water ponded in northern half. Reeds and phragmites are growing at the north end. The south half has oily, brown to black iron rich sludge piles. The pit is approximately 200' by 350' with the surrounding berm rising 8' to 14'

SHEET ______ OF ______

BY ______________________ TITLE ______________________

REVIEWED BY: ______________________ PROJECT ENGINEER

S5

SWMU INSPECTION REPORT (cont'd)

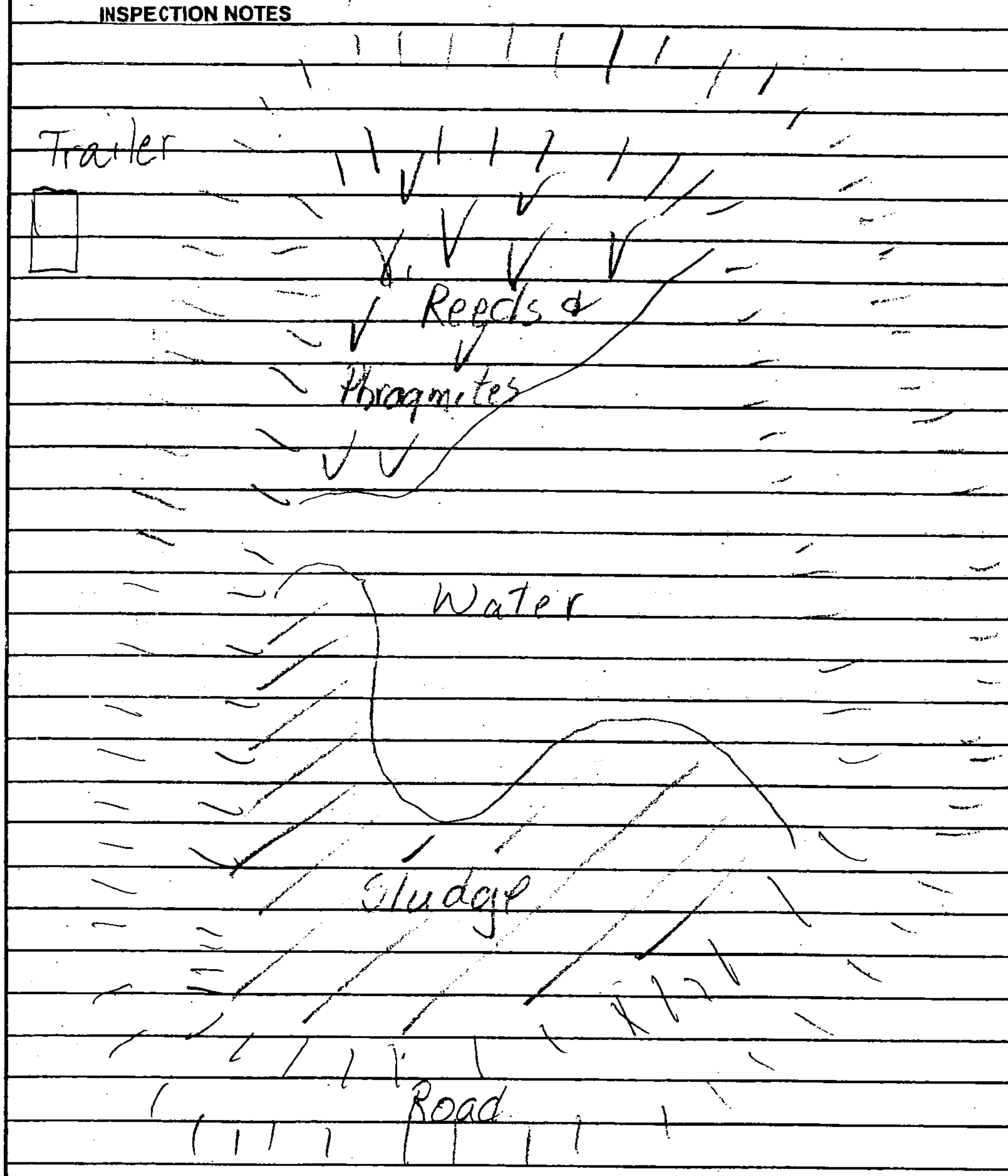
PROJECT BSC Lackawanna

URS CORP JOB No. 42-00008BSC.15

REPORT No.

DATE 4/11/01

INSPECTION NOTES



SHEET ___ OF ___

S-5

BY ___ TITLE ___

REVIEWED BY: ___ PROJECT ENGINEER

FIELD INSPECTION CHECKLIST
SWMU SURFACE WATER RUNOFF POTENTIAL EVALUATION
BETHLEHEM STEEL CORPORATION
LACKAWANNA, NEW YORK

SWMU #: S-5

SWMU Name: Surface Impoundment E

Date of Inspection: 9/5/96

Inspector(s): J. Hannon

TYPE OF SWMU (check type and configuration and add comments):

Type:

______ Landfill X Impoundment

______ Pit/sump/trench ______ Pile

Configuration:

______ Level
______ Above Grade - height______ ft
X Depression depth 9-12 ft
______ Interior trench/pit/sump width _____ feet, length______ ft,
depth______ ft, height of top above grade______ ft
______ Free board 9 ft
______ Other (describe) Low spot on North side allows runoff to flow into site; Dike removed for about 50' on SE dump Area; surface water will flow into site not out.

Comments: Surface Impoundment w/BLACK powdery Mill scale; some Water on surface; Aquatic Vegitation on NW side of impoundment; Dikes are slag w/ dense weeds with some trees.

SWMU# S-5

Inspection Date: 9/5/96

SURFACE OF SWMU (check all that apply and add comments):

Material:

_____ Concrete/Asphalt
_____ Grass
_____ Slag
X Other (describe): Waste mill scale some water

_____ Unvegetated Soil
_____ Trees/Shrubs
X Liquid

Comments: Access road into site is on SE corner which ramps down into site

SURROUNDING AREA (Attach topography map and indicate features of interest, check all that apply and add comments):

Features:

_____ Buildings, direction _____, distance _____ ft
_____ Road, type _____, direction _____, distance _____ ft
_____ Railroad, direction _____, distance _____ ft
X Other (describe): S-1; -S-6, S-7/20; S-27 in vicinity

Ground Surface:

_____ Concrete/Asphalt
_____ Grass
X Slag
_____ Other (describe):

_____ Unvegetated Soil
X Trees/Shrubs
_____ Liquid

SWMU# S-5

Inspection Date: 9/5/96

Comments:

Surrounding topography:

X Level to N, E, W
X Sloped to 2H at 1V ft (vertical) per feet (horizontal)

Comments: South of site Across Access road Area slopes downhill ~ 30 FT. to A used equipment area then about 1000 FT to the slag processing area

CONTAINMENT SYSTEM (check all that apply and add comments):

_____ Cover - type None
_____ Concrete sump/pit
_____ Concrete trench
_____ Wooden trench
_____ Berm or dike
height _____ ft
width _____ ft at crest
width _____ ft at base

Comments: At the access road Berm is ~3' high but water/waste elevation is 6-9 FT below road grade

DISTANCE TO NEAREST SURFACE WATER BODY: 550 ft, direction W

Name of water body: LAke Erie

SWMU# S-5

Inspection Date: 9/5/96

VISUAL EVIDENCE OF RUN ON

X No

______ Yes, Description:

VISUAL EVIDENCE OF RUN OFF:

X No

______ Yes, Description:

If Yes, which of following are present?

______ Erosion scars on SWMU

______ Sediments near SWMU in runoff areas

______ Staining in SWMU runoff areas

______ Distressed vegetation in SWMU runoff areas

DOES RUNOFF REACH SURFACE WATER BODY? NO

If yes, provide description:

SWMU# S-5

Inspection Date: 9/5/96

PHOTO LOG

Direction	Description	
[✓ N] E S W	From SW corner	1
[✓ N] E S [✓ W]	From SE corner	2
N E [✓ S] W	From NW corner	3
N [✓ E] [✓ S] W	From SW corner	4
N [✓ E] S W	Erosion on dike Between S-5 & S-7	5
[✓ N] E S [✓ W]	From SE corner	6
N [✓ E] S W	Low spot At northern dike	7
N [✓ E] S W	View of eastern dike from W	8
N [✓ E] [✓ S] W	SE corner from western Dike	9
N E S W		
N E S W		
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SWMU INSPECTION REPORT

SWMU - 5 - 6

DATE 4/11/01 - 11:50

DAY	S	M	T	[✓ W]	TH	F	S

PROJECT BSC Lackawanna, NY
OWNER BSC Corp
CONTRACT No. 42 00008BSC.15
URS CORP JOB No. 42 00008BSC.15 20000
URS CORP PROJECT MANAGER J. Jacobi

WEATHER	Bright Sun	Clear	[✓ Overcast]	Rain	Snow
TEMP	To 32	32-50	[✓ 50-70] 60°F	70-85	85 up
WIND	[✓ Still]	Moder	High	Report No.	
HUMIDITY	Dry	[✓ Moder]	Humid		

Name of Contractor	Non-manual	Manual	Remarks

VISITORS

Time	Representating	Representating	Remarks

EQUIPMENT AT THE SITE None

Inspectors M Colmeraver, T Burmeier

INSPECTION NOTES

5-6 is approximately "L" shaped, over all dimensions 200 Feet by 240 ft. Pit is surrounded by debris piles in a berm-like configuration. Piles consist of soil, slag gravel and bricks East side of pit is at grade, piles 2 to 5 feet above grade. Floor of pit is flat, composed of brown iron rich soil, with a sludge like appearance and high water content.

SHEET ____ OF ____

BY ________ TITLE ________

REVIEWED BY: ________ PROJECT ENGINEER

URSF-011/1 OF 3/GDCONREP

SWMU INSPECTION REPORT (cont'd)

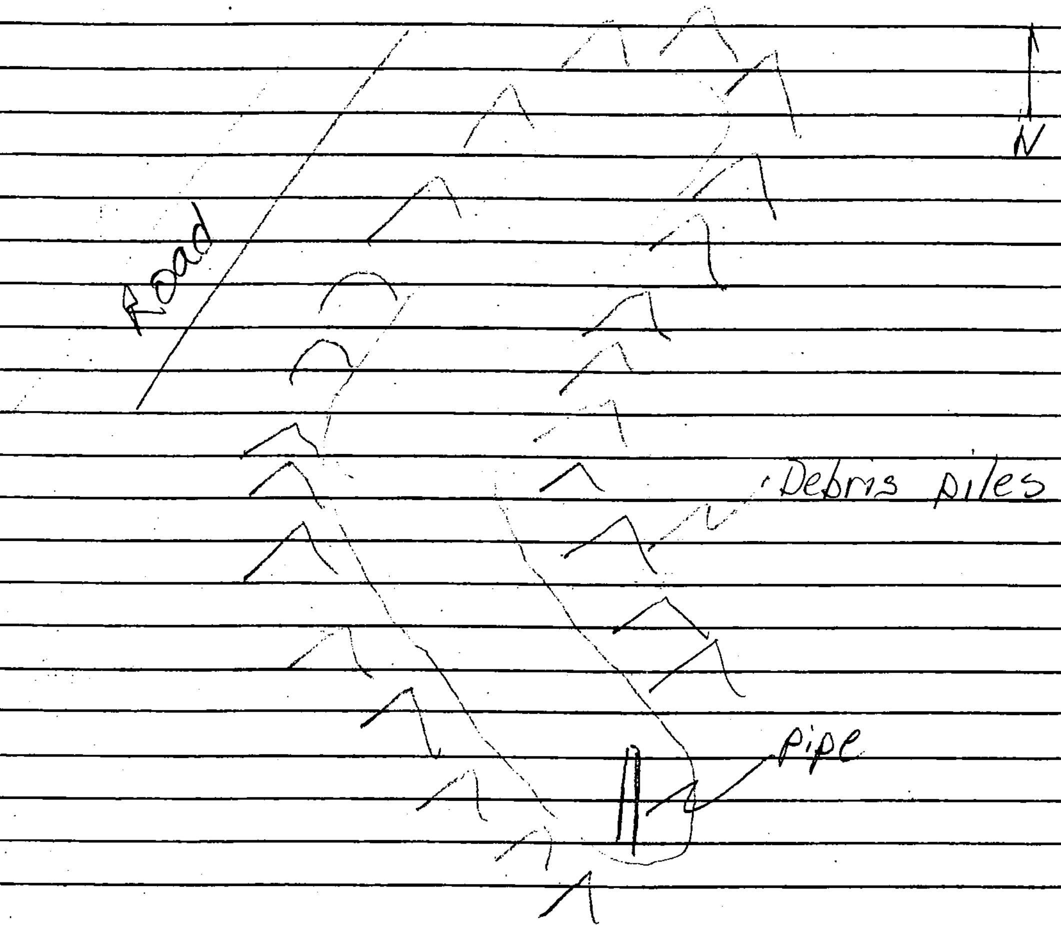
PROJECT BSC Lackawanna NY

URS CORP JOB No. 42-00008BSC.15

REPORT No. S-6

DATE 4/11/01

INSPECTION NOTES



SHEET_____ OF_____

BY_____ TITLE_____

REVIEWED BY: _____ PROJECT ENGINEER

URSF-011/2 OF 3/GDCONREP

FIELD INSPECTION CHECKLIST
SWMU SURFACE WATER RUNOFF POTENTIAL EVALUATION
BETHLEHEM STEEL CORPORATION
LACKAWANNA, NEW YORK

SWMU #: 5-6

SWMU Name: Surface Impoundment F

Date of Inspection: 9/5/96

Inspector(s): J. Hannan

TYPE OF SWMU (check type and configuration and add comments):

Type:

______ Landfill X Impoundment

______ Pit/sump/trench ______ Pile

Configuration:

______ Level
______ Above Grade - height ______ ft
X Depression depth 2 ft
______ Interior trench/pit/sump width ______ feet, length ______ ft,
depth ______ ft, height of top above grade ______ ft
______ Free board 2 ft
______ Other (describe) ______

Comments: Dark red to orange color no liquid surface dry powdery - 1/2 inch sinking on footprint moderate to heavy vegetative cover

SWMU# 5-6

Inspection Date: 9/5/96

SURFACE OF SWMU (check all that apply and add comments):

Material:

____ Concrete/Asphalt
____ Grass
____ Slag
✓ Other (describe): weeds on powdery waste

____ Unvegetated Soil
____ Trees/Shrubs
____ Liquid

Comments: 1/2 inch depressin when walking on waste

SURROUNDING AREA (Attach topography map and indicate features of interest, check all that apply and add comments):

Features:

____ Buildings, direction ____, distance ____ ft
____ Road, type ____, direction ____, distance ____ ft
____ Railroad, direction ____, distance ____ ft
✓ Other (describe): Adjacent to 5-5 and 5-7/20

Ground Surface:

____ Concrete/Asphalt
____ Grass
____ Slag
____ Other (describe): ____

✓ Unvegetated ~~Soil~~ waste
✓ Trees/Shrubs med to dense
____ Liquid

SWMU# S-6

Inspection Date: 9/5/96

Comments:

Surrounding topography:

X Level

______ Sloped to _________ at __________ ft (vertical) per feet (horizontal)

Comments: level to west & North; (S-5 & S-7/20) to east
Steep slope east of site; SE of site - access
road decends slope to lower plant elevation

CONTAINMENT SYSTEM (check all that apply and add comments):

______ Cover - type None
______ Concrete sump/pit
______ Concrete trench
______ Wooden trench
______ Berm or dike Minimum
height 2 ft
width 0 ft at crest
width 8 ft at base

Comments: there is a berm of varying size along
the site. The lowest point is about 2 feet high
on the western side of the unit

DISTANCE TO NEAREST SURFACE WATER BODY: 800 ft, direction W

Name of water body: Lake Erie

SWMU# S-6

Inspection Date: 9/5/96

VISUAL EVIDENCE OF RUN ON

X No

____ Yes, Description: ____________________

VISUAL EVIDENCE OF RUN OFF:

X No

____ Yes, Description: ____________________

If Yes, which of following are present?

____ Erosion scars on SWMU

____ Sediments near SWMU in runoff areas

____ Staining in SWMU runoff areas

____ Distressed vegetation in SWMU runoff areas

DOES RUNOFF REACH SURFACE WATER BODY? NO

If yes, provide description: ____________________

SWMU# S-6

Inspection Date: 9/5/96

PHOTO LOG

Direction	Description	
N E [✓ S] W	Site to the south	1
N E [✓ S] W	site to the south	2
N E S [✓ W]	site to the west	3
N E S [✓ W]	site to the west	4
N [✓ E] S W	Site to the east	5
N [✓ E] S W	site to the east	6
[✓ N] E S W	Site to the north	7
[✓ N] E S W	site to the north	8
[✓ N] E S W	close up of waste surface	9
N E S W		
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SWMU INSPECTION REPORT

SWMU S-7/S-20

DATE 8/28/00

DAY	S	M	T	W	TH	F	S
		[✓]					

WEATHER	[✓ Bright Sun]	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	[✓ 70-85]	85 up
WIND	Still	[✓ Moder]	High	Report No.	
HUMIDITY	Dry	[✓ Moder]	Humid		

PROJECT BSC LACKAWANNA RFI
OWNER BSC
CONTRACT No.
URS CORP JOB No. 42000008BSC.15
URS CORP PROJECT MANAGER J. Jacobi

AVERAGE FIELD FORCE

Name of Contractor	Non-manual	Manual	Remarks

VISITORS M. Colmerauer

Time	Representating	Representating	Remarks
4:00 pm	URS Corp.		

EQUIPMENT AT THE SITE None

~~CONSTRUCTION ACTIVITIES~~ Site Observations

SWMU S-7/S-20 is located within the Lake Shore surface impoundments area.

- It is bounded on the west and south sides by gravel access roads. Slag walls ranging from five (5) to approx. fifteen (15) feet bound the SWMU. An access road is present on the east side and provides access to the SWMU. East of S-7/S-20 the slag slopes steeply to the SWMU S-21 and acid/tar pit areas.

- The surface of S-7/S-20 is flat, red, granular, sparsely ~~un~~ MC vegitated materiall. Concrete-like pads from former

SHEET 1 OF 2

BY Mark Colmerauer TITLE Geologist

REVIEWED BY: PROJECT ENGINEER

SWMU INSPECTION REPORT (cont'd)

PROJECT BSC Lackawanna RFI

URS CORP JOB No. 42000008BSC.15

REPORT No.

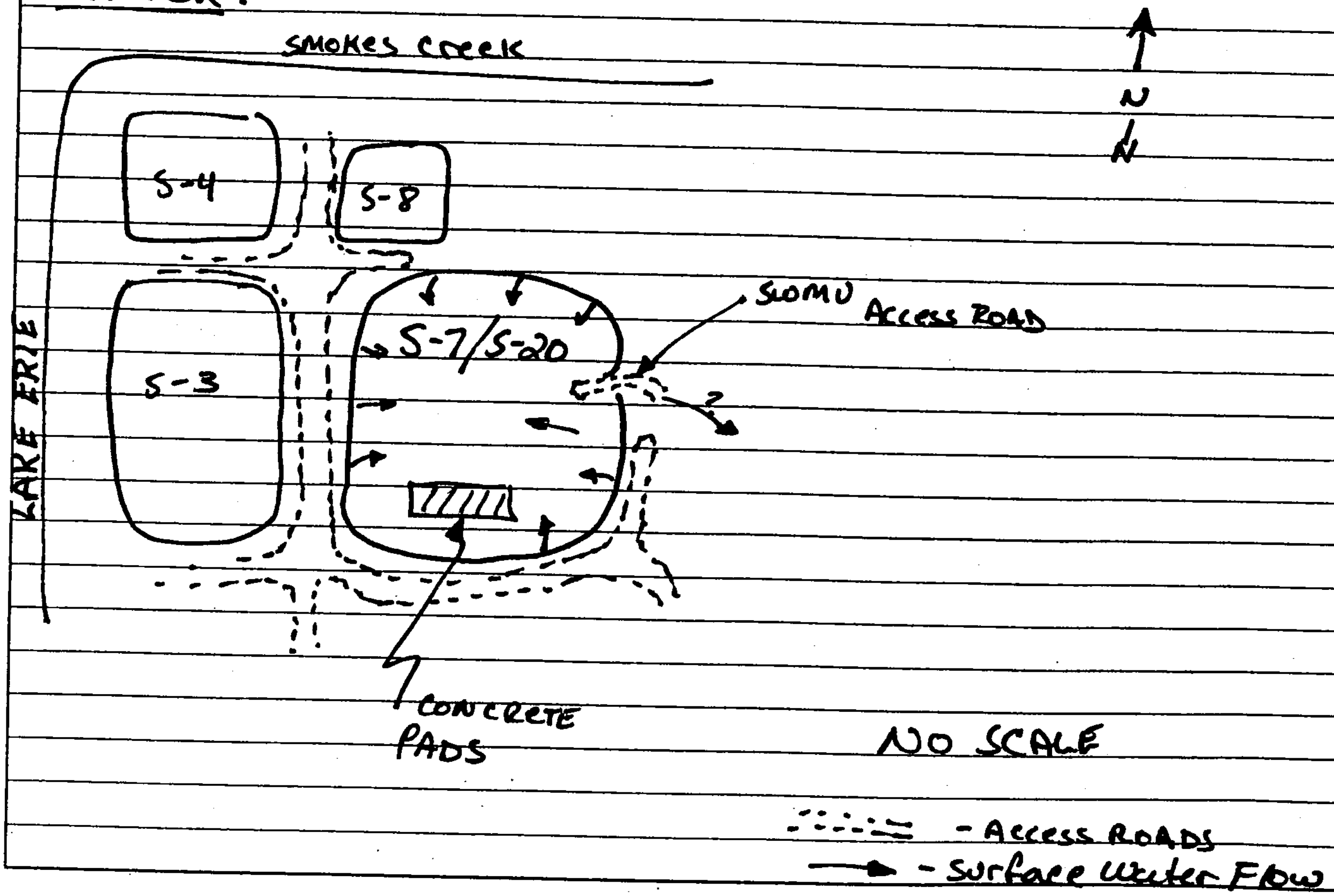
DATE 8/28/00

CONSTRUCTION ACTIVITIES (cont'd) SWMU S-7/S-20

Material Stabilization pilot tests are present on the south end.

- Surface water ~~is~~ come run off is contained within the SWMU area although it may be possible for some to leave the SWMU area over the access road to the east, where it would infiltrate the slag fill surface.

Sketch:



SHEET 2 OF 5

BY Mark Colmerauer TITLE Geologist

REVIEWED BY: PROJECT ENGINEER

FIELD INSPECTION CHECKLIST
SWMU SURFACE WATER RUNOFF POTENTIAL EVALUATION
BETHLEHEM STEEL CORPORATION
LACKAWANNA, NEW YORK

SWMU #: S-7/S-20

SWMU Name: Surface Impoundment G

Date of Inspection: 9/5/96

Inspector(s): J. Hannon

TYPE OF SWMU (check type and configuration and add comments):

Type:

_____ Landfill X Impoundment

_____ Pit/sump/trench _____ Pile

Configuration:

_____ Level
_____ Above Grade - height_____ ft
_____ Depression depth_____ft
_____ Interior trench/pit/sump width _____ feet, length_____ ft,
depth_____ ft, height of top above grade_____ft
_____ Free board_____ft
X Other (describe) The site is relatively level, there are high slag walls around the site except in the center of the East wall which allows surface water to drain from the tempory cap.

Comments:

SWMU# S-7/S-20

Inspection Date: 9/5/96

SURFACE OF SWMU (check all that apply and add comments):

Material:

______ Concrete/Asphalt
______ Grass
______ Slag
X Other (describe): orange gravel over waste

______ Unvegetated Soil
______ Trees/Shrubs
______ Liquid

Comments: Site is very level there are trial capping test plots on surface

SURROUNDING AREA (Attach topography map and indicate features of interest, check all that apply and add comments):

Features:

______ Buildings, direction ______, distance ______ ft
X Road, type Access, direction NSW, distance 30-50' ft
______ Railroad, direction ______, distance ______ ft
______ Other (describe): S-5 & S-6 to south; S-2 & S-3 to W; S-8 - North; S-21 East.

Ground Surface:

______ Concrete/Asphalt
______ Grass
______ Slag
______ Other (describe):
X Orange gravel mixture (CAP)

______ Unvegetated Soil
______ Trees/Shrubs
______ Liquid

SWMU# S-7/S-20

Inspection Date: 9/5/96

Comments:

Surrounding topography:

X Level -W-N-S
X Sloped to east at 2:1 ft (vertical) per feet (horizontal)

Comments: This site is on a plateau surrounded by S-2-S-5, S-6, S-8, S-4

East of the unit is lower and the site cap drains in this direction

CONTAINMENT SYSTEM (check all that apply and add comments):

X Cover - type synthetic w/ gravel cover
___ Concrete sump/pit
___ Concrete trench
___ Wooden trench
X Berm or dike
height 0-30 ft
width ___ ft at crest
width ___ ft at base

Comments: the surface of the site (cap) drains to the east

DISTANCE TO NEAREST SURFACE WATER BODY: 570 ft, direction W

Name of water body: Lake Erie

SWMU# S-7/S20

Inspection Date: 9/5/96

VISUAL EVIDENCE OF RUN ON

X No

_____ Yes, Description:

VISUAL EVIDENCE OF RUN OFF:

X No

_____ Yes, Description: But if large site runoff occurs it will flow through the opening on the east side

If Yes, which of following are present?

_____ Erosion scars on SWMU

_____ Sediments near SWMU in runoff areas

_____ Staining in SWMU runoff areas

_____ Distressed vegetation in SWMU runoff areas

DOES RUNOFF REACH SURFACE WATER BODY? No

If yes, provide description:

SWMU# S-7/S-20

Inspection Date: 9/5/96

PHOTO LOG

Direction	Description	
N E S W	Site to north	1
N E S W	Site to NE	2
N E S W	Site to E	3
N E S W	Cap surface drainage course	4
N E S W	Close up of cap tests area	5
N E S W		
N E S W		
N E S W		
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N E S W		

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

SWMU INSPECTION REPORT

SWMU - S-27

DATE 4/11/01

DAY	S	M	T	W	TH	F	S
				X			

WEATHER	Bright Sun	Clear	Overcast X	Rain	Snow
TEMP	To 32	32-50	50-70 50°F	70-85	85 up
WIND	Still X	Moder	High	Report No.	
HUMIDITY	Dry	Moder X	Humid		

PROJECT BSC Lackawanna NY
OWNER BSC Corp
CONTRACT No. 42 000C8BSC.15
URS CORP JOB No. 42 00008BSC.15 20000
URS CORP PROJECT MANAGER J. Jacobi

Name of Contractor	Non-manual	Manual	Remarks

VISITORS

Time	Representating	Representating	Remarks

EQUIPMENT AT THE SITE None

Inspectors M. Colmeraver, T. Burmeier

INSPECTION NOTES

SWMU-27 is about 380 by 100 Feet, irregularly shaped and slopes approximately 10 Feet from north to south. Slope is uniform to undulating and mostly covered by trees, shrubs, grasses and moss. Soil is medium to dark brown where exposed with scattered debris (tires, metal) No incised drainage was noted. No containment was noted to the south. Piles of concrete pipes at base of slope.

SHEET ____ OF ____

BY ______________________ TITLE ______________________

REVIEWED BY: ______________________ PROJECT ENGINEER

URSF-011/1 OF 3/GDCONREP

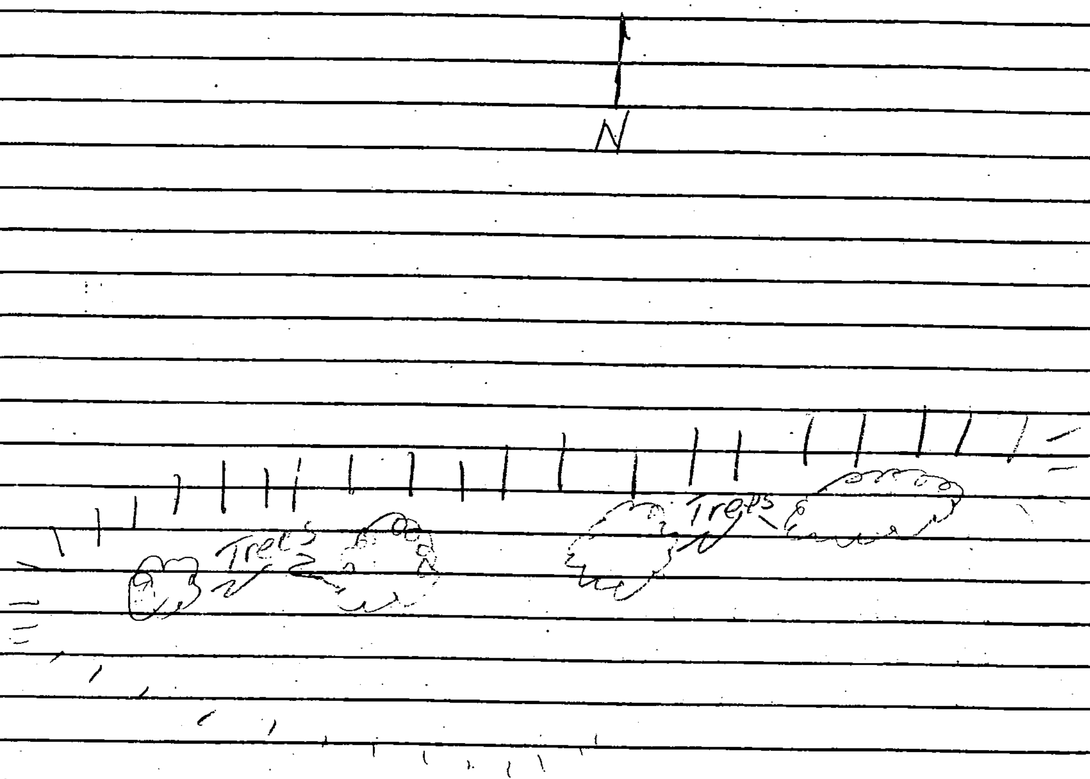
S-27

SWMU INSPECTION REPORT (cont'd)

PROJECT BSC Lackawanna NY
URS CORP JOB No. 42 00008 BSC. 15

REPORT No.
DATE 9/11/01

INSPECTION NOTES



SHEET ____ OF ____

BY ____________ TITLE ____________

REVIEWED BY: ____________ PROJECT ENGINEER

FIELD INSPECTION CHECKLIST
SWMU SURFACE WATER RUNOFF POTENTIAL EVALUATION
BETHLEHEM STEEL CORPORATION
LACKAWANNA, NEW YORK

SWMU #: S-27

SWMU Name: SLUDGE DISPOSAL AREA

Date of Inspection: 9/5/96

Inspector(s): J. HAN

TYPE OF SWMU (check type and configuration and add comments):

Type:

______ Landfill

______ Pit/sump/trench

______ Impoundment

______ Pile

Configuration:

____________ Level
____________ Above Grade - height ~6 ft
____________ Depression depth__________ft
____________ Interior trench/pit/sump width _____ feet, length_________ ft, depth_______ ft, height of top above grade_____________ft
____________ Free board 2 ft
____________ Other (describe)________________________________

Comments: S-21 is on south side of impoundment Access ROAD. There is about 30 FT elevation Difference Because S-27 is near the side of a hill towards the south. Unit contains piles of BLACK Powdery millscale

SWMU# S-21

Inspection Date: 9/5/96

SURFACE OF SWMU (check all that apply and add comments):

Material:

☐ Concrete/Asphalt
☐ Grass
☒ Slag
☐ Other (describe):

☒ Unvegetated Soil /waste
☒ Trees/Shrubs
☐ Liquid

Comments: The unit is constructed on a slag fill with an elevation difference between N & S of About 30 FT.

SURROUNDING AREA (Attach topography map and indicate features of interest, check all that apply and add comments):

Features:

☐ Buildings, direction ______, distance ______ ft
☐ Road, type ______, direction ______, distance ______ ft
☒ Railroad, direction S, distance 150 ft ABANDONED only ties can be seen
☒ Other (describe): Slag processing <1000 FT South
S-1, 25 FT N.

Ground Surface:

☐ Concrete/Asphalt
☐ Grass
☒ Slag
☐ Other (describe): There is a heavy growth of small trees and weed on the unit

☐ Unvegetated Soil
☒ Trees/Shrubs
☐ Liquid

SWMU# 5-21

Inspection Date: 9/5/96

Comments: Ground surface uneven on slope
Slag covered granular surface

Surrounding topography:

x Level to N
x Sloped to 3V at 10H ft (vertical) per feet (horizontal)

Comments: SlAg processing Area 200 FT south

CONTAINMENT SYSTEM (check all that apply and add comments):

_____ Cover - type None
_____ Concrete sump/pit
_____ Concrete trench
_____ Wooden trench
x Berm or dike
height 2 ft AT West side
width 1 ft at crest
width 6 ft at base

Comments: Berm is not contiguous on south of unit
It Appears waste may have Been dumped on the North side of the North Berm

DISTANCE TO NEAREST SURFACE WATER BODY: 200 ft, direction W

Name of water body: LAKE Erie

SWMU# S-21

Inspection Date: 9/5/96

VISUAL EVIDENCE OF RUN ON

X No

_______ Yes, Description:

VISUAL EVIDENCE OF RUN OFF:

_______ No

X Yes, Description: there is visible erosion at the end of the access road towards Lake Erie It does not appear that waste materials have Been affected

If Yes, which of following are present?

X Erosion scars ~~on~~ near SWMU

_______ Sediments near SWMU in runoff areas

_______ Staining in SWMU runoff areas

_______ Distressed vegetation in SWMU runoff areas

DOES RUNOFF REACH SURFACE WATER BODY? Y

If yes, provide description: could reach lake Erie

Irons May 17, 1988

B E T H L E H E M   S T E E L
Bethlehem, PA

Interoffice Correspondence
Corporate Development and
Human Resources
Environmental Control

MAY 17, 1988

R606-E5-A242

From: S. D. Irons

To: R. B. Allen

Subject: PRELIMINARY RESULTS TO CHARACTERIZE MATERIALS IN LACKAWANNA IMPOUNDMENTS AND LANDFILL AREAS - STATUS REPORT #1

Reference: Memo - Characterization of Materials in Lackawanna Impoundments and Landfill Areas, SDIrons to THWeidner, March 7, 1988.

A sampling program was conducted during March 28-31, 1988 at the Lackawanna Plant to collect representative samples of the various materials in the numerous impoundments and miscellaneous piles in the landfill area. Our sampling program was proposed as a result of discussions with you (see reference). The purpose of the work was to determine the physical and chemical characteristics of these solids, so that data would be available for use in developing a plan of action for recycling or disposing of these materials. The following write-up details the sampling program, sample processing and preliminary test results available on the samples to date. A discussion is provided on the characterization of the samples and their origin.

SAMPLING PROCEDURE FOR THE IMPOUNDMENTS AND PILES

It was proposed in the reference to collect 3-6 samples from as many of the impoundments as possible during the visitation, using a split spoon drilling procedure for sampling, as well as grab sampling techniques. Split spoon drilling was desired for the impoundments due to their depth and this service was provided by a contractor. Empire Soils Investigations Inc. provided the drilling rig and manpower for the impoundment sampling. However, mobility of the drilling rig on the impoundment surfaces due to the poor load bearing characteristics of the material was a problem that had not been anticipated. Because of the time involved with set-up of the drill rig at a given site, it was decided to scale down the scope of the sampling and collect only one sample from each impoundment.

Impoundments S-2 and S-6 were generally suitable for access and support of the drilling rig. However, impoundments S-1 and S-4 had limitations which prevented access by the drilling rig. S-1 had poor bearing strength material and S-4 had a steep slope to enter the impoundment. To get access to S-1 and S-4 a crane was used to position the drilling rig. In addition, planking and plywood were required to support the drilling rig in the S-1 impoundment. In the other impoundments, S-2 and S-6, the drilling rig was moved by cable (external with other equipment or by its own winch) to a suitable site for drilling. We did not sample S-3 and S-5 during our visit.

Once in place, the drilling rig used the impact from a dropped 30# weight to drive a 2' long by 2" diameter pipe into the material to be sampled. In addition, the unit auger drilled a large outer hole and thereby cased the hole to prevent a collapse when the 2" pipe was withdrawn. Augering and impact drilling continued in 2' sections until the bottom of the lagoon was reached. Drilling ceased when impacting could not drive the 2" spoon sampler deeper. Generally a slag or brick/rubble bottom was encountered. We had expected to drill to depths of 40' or more but in all cases drilling was stopped at 35' depth or less.

Samples from the split spoon drill rig were composited in 8-12' increments based on visual observations of the material. Hence for a 35' deep hole, three individual samples were collected, placed in plastic buckets and then returned to Bethlehem for processing. The three cored increments would provide some information on the variability of material at the various vertical levels.

In addition to sampling of the impoundments by drilling, 16 samples were collected from an area referred to as the "Golden Triangle". This area is between Smokes Creek and the road to the impoundments, and is east of the impoundment area.

In the Golden Triangle there are numerous piles of different volumes and composition. Our intent was to make an exploratory assessment of the material in these piles and collect samples that would represent a cross section of the different materials present. Sampling of a pile was generally based on a visual assessment which indicated that there was a difference of composition. Most of the piles that contained large volumes were sampled. A number of piles in the triangle area were not sampled because they appeared to be similar in composition to others. Surface grab sampling with a shovel was used since sampling with the aid of a back-hoe or other device was not possible at that time. Ten to 15 pound samples were collected from each site and the material was sealed in plastic buckets. For all the samples collected, a chain-of-custody form was completed and this form is on file in the Waste Management Group.

MAP OF THE SITE AND SAMPLING LOCATIONS

Figure 1 shows a sketch of the Lackawanna plant site with the impoundments and Golden Triangle area. The impoundments are identified by an S-1 to S-7 classification and the asterisk notes the approximate location of the drill cores. Samples identified as T-1 to T-16 were collected in the Golden Triangle area. These are located as approximate sites since the grab samples were collected on a walk-through basis.

SAMPLE PREPARATION

All samples were returned to Bethlehem in sealed plastic buckets. Initial processing consisted of taking a representative sample from the total composite via cone and quartering technique. This technique was used considering moisture, size consist and oily nature of some of the samples. Subsequently, the representative samples were oven dried to determine moisture content and then these dried samples were further split into several 100 gram increments via a rotary splitter for size analysis and chemistry. Chemistry and oil analyses were conducted by the Analytical Chemistry Group at Research.

DISCUSSION

To characterize and determine the origin of the material in the impoundments at the Lackawanna Plant, we have included data from the Site Investigation conducted by Empire Soils Investigations Inc., May 1984, along with the recent data developed from the samples collected during March 1988. In our analysis we have considered the type of material believed to have been disposed in these impoundments based on historical information. Table 1 gives typical characteristics of materials discarded in the waste impoundments. These data allow us to consider the following material compositions in our assessment - oil and grease is typical to WQCS #5, #6 and #7 sludges; C^{free} is from blast furnace sludge; a high % of -400 mesh is from a WQCS #7 material and a low % of -400 mesh is typical of WQCS #6; zinc is high in recent WQCS #7, almost zero in WQCS #6 and 0.5-2.0% in blast furnace, BOF and old WQCS #7; CaO is zero in WQCS #6, about 5-10% in BOF, blast furnace and recent WQCS #7 material and above 10% in old WQCS #7. Using these criteria, it can be seen that in most cases there is a definite picture of a heterogeneous mixture of material from two or more sources. The discussion of our assessment follows:

S-1 Impoundment

A. Surface Grab Sample (S-1A) - This is a black colored, high oil content sample with high iron, low calcium, measurable zinc and free carbon. We believe this material is primarily hot mill sludge from WQCS #5 and #6, with some contamination from WQSC #7 and/or BOF material. A thermal gravimetric analysis (TGA) of the oil from this sample compared the volatility of this oil to the volatility of recent samples taken at the Lackawanna plant.* The TGA pattern of this S-1A oil is nearly identical to the previous TGA conducted on a sample referred to as Middle East from the hot strip mill (October 12, 1987). This sample was also taken from the impoundment S-1. The TGA analyses were conducted by the Refractories Group at Research.

B. Core Sample 0-8' (S-1C) - The predominate black color, high iron, high oil and grease, as well as the zinc, calcium and free carbon analyses clearly indicate that this sample is from WQCS #5 & #6.

C. Core Sample 8-16' (S-1D) - This sample is primarily red with some black contamination. The iron, oil and grease are lower than the S-1C material, and the higher content of zinc, calcium and minus 400 mesh fines point to the addition of mainly BOF material and/or WQSC #7. The increase in free carbon may indicate some blast furnace material. This is definitely a heterogeneous sample from two or more sources. Previous studies indicated that only WQCS #5 and #6 were disposed of in this pit not the BOF, blast furnace and or WQCS #7 that we believe could be present.

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* Reference Laboratory Study of the Hydrocarbons in Lackawanna Mill Scales and Solid Wastes, SDIrons to THWeidner, October 12, 1987.

D. Core Sample 16-24' (S-1E) - This sample is mainly black and more typical of WQCS #5 and #6; however, the zinc, calcium and free carbon contents point to the presence of blast furnace and WQCS #7 material similar to the S-1D sample.

E. Empire Data - Based on the color, high iron content and high oil and grease levels, the source of the material apparently is WQCS #5 and #6.

S-2 Impoundment

A. Core Sample 0-12' (S-2A) - This sample is primarily red with black layers indicating BOF material. The oil and grease level, the zinc content, the calcium and fine size consist indicate a WQCS #7 material. The high free carbon indicates blast furnace sludge. Hence, the previous documentation of these materials having been disposed in this impoundment appears to be correct.

B. Core Sample 12-24' (S-2B) - This material is generally black with high carbon and calcium suggesting a blast furnace material. The oil and grease as well as the zinc content and fine particle size consist point to WQCS #7 as being present. Final thickener sludge (BOF & BF solids) and zinc ammonia chloride flux may have also contributed to this composition.

S-3 Impoundment - The only data are from the Empire Soils drilling study of this impoundment. Based on the iron, oil and grease, zinc and calcium levels the documented sources could be valid, especially blast furnace and WQCS #7 material. There are no free carbon analyses which would be very meaningful in the assessment.

S-4 Impoundment

A. Auger Cuttings (S-4B) - This material is primarily black in color indicating a blast furnace type material with measurable amounts of carbon. However, the high calcium and measurable zinc indicate the addition of other materials, including high lime components. It is difficult to assess the origin of this sample based on composition; but we believe that creek dredgings originating from various overflows in the plant are the likely source of this material as is documented in other reports.

B. Grab Sample (S-4C) - This material is black but very low in iron and very high in calcium. The size consist is also very fine. Lime is a major component and dredgings are a likely source. The trace of oil and grease on the sample may come from WQCS #7.

C. Grab Sample (S-4D) - This material is nearly identical to the S-4C sample; hence a dredging identification is applicable.

D. Empire Core Data - These data show greater amounts of iron, oil/grease and added zinc than the samples recently collected by us. Calcium is still high. It is difficult to determine if these samples have material from other sources; however, the Empire samples were cores which suggest that the dredgings may be highly variable in composition. The very high iron is noted to be from metal particles.

S-5 Impoundment - Empire Soils Data - The black color and oily description and content, as well as the high iron content point to WQCS #5 and #6. Without additional data the bulk of the material appears to be from those sources. The one sample with low oil and grease and high water content (fine particle size consist) is difficult to assess. It likely contains blast furnace material due to the composition and black color. It is difficult to determine if other sources may have contributed to the composition.

S-6 Impoundment

A. Core sample 0-11½' (S-6A) - This sample is overall red in color and has only traces of oil and grease with moderately high iron levels. This composition points to a BOF material that has been contaminated with a material like older WQCS #7 sludge which would add oil and also dilute the level of iron in the BOF material. The documentation that WQCS #7 and the BOF final thickener are present is likely. There is no indication of material coming from WQCS #6.

B. Core Sample 12-24' (S-6B) - This sample is nearly identical to the S-6A sample; hence it is likely BOF and WQCS #7 material.

C. Core Sample 24-25' (S-6C) - The sample is also identical to the S-6A and S-6B samples and the source of BOF and WQCS #7 is indicated.

Golden Triangle Area - Sixteen grab samples were collected from various piles in the Golden Triangle area to get a preliminary assessment of the composition of materials present in this area. Sampling was based on a visual assessment of material differences as well as selection due to piles containing large volumes. These data are given in Table 8. The results show that there are distinct materials as well as mixtures of OH fume, mill scales, lime, carbon forms, kish, flue dust and possibly ground. These data provide a basis for expanded study of piles in the Golden Triangle.

Work in Progress

We are currently conducting EPToxicity testing on selected samples and are also conducting additional chemical analyses to aid in the identification of the sample composition. We have submitted composite samples from S-1, S-2, S-4 and S-6 lagoons to BLT Technical Services, Inc. of Niagara Falls, NY for a complete TCLP analysis (i.e. both heavy metals and organics). We also plan to conduct laboratory and small pilot tests to determine the amenability of the various samples to beneficiation. For example, S-2 sludge appears to contain a high percentage of blast furnace slurry and might be treatable by Bethlehem's patented hydrocyclone process for removing zinc and lead.

It does seem obvious that more sampling will be needed to firm up our evaluation and conclusions (especially in S-2 and S-5). We would like to discuss this with you in the near future.

S. D. Irons mw

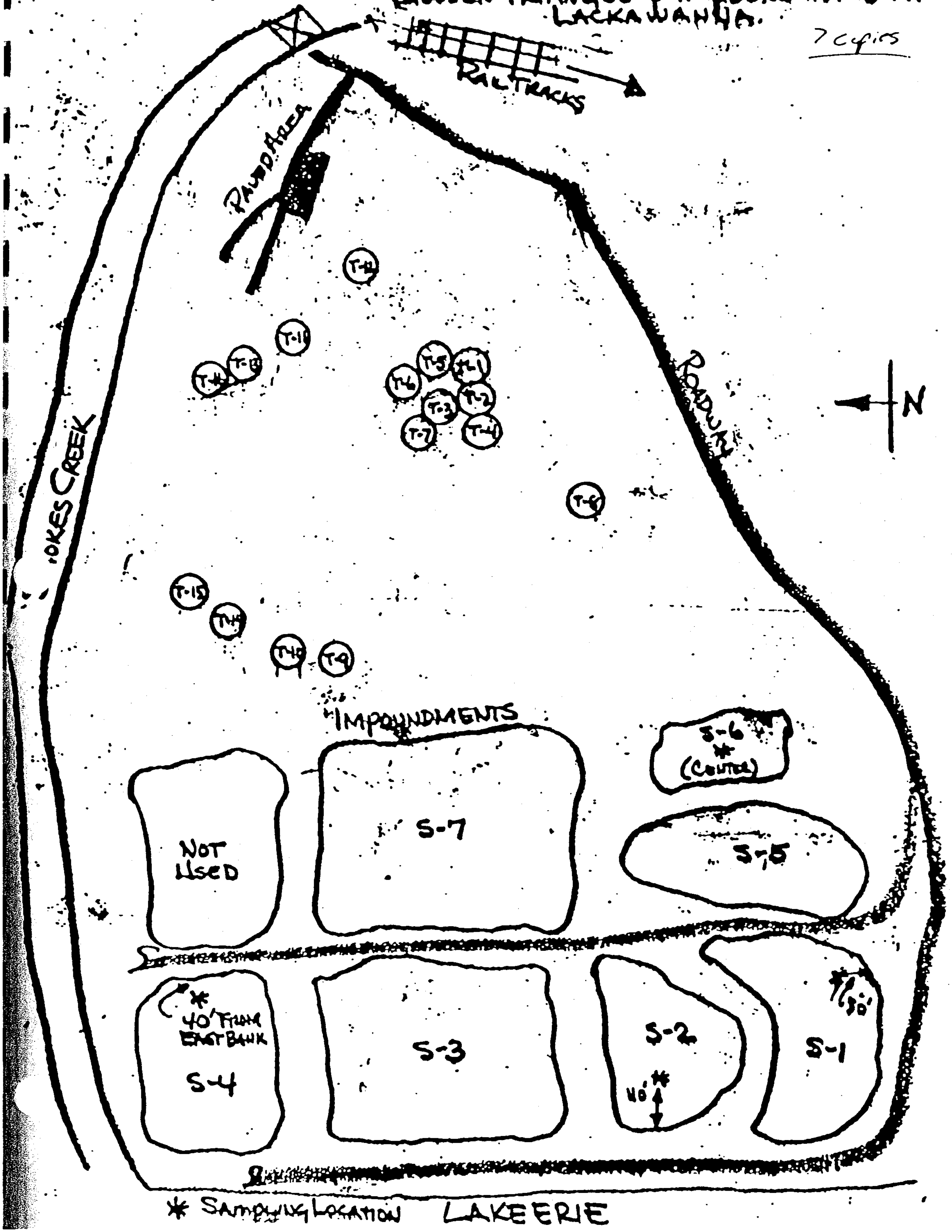
S. D. Irons

SDI:nar

cc: LMHarbold THWeidner
DGBoltz JDLynn
DGBays

FIGURE 1 – SKETCH OF SAMPLING SITES IN THE GOLDEN TRIANGLE & IMPOUNDMENTS AT LACKAWANNA.

7 copies



	A	B	C	D	E	F	G	H
1		MWS-11A	MWS-12A	MWS-12B	MWS-13	MWS-14	MWS-15	MW2-U1
2	**Volatiles**							
3	benzene	8.2	120	220		18	16	17
4	dibromochloromethane	3.4	7.7					
5	1,1-dichloroethane				3.3	17	5.4	7.4
6	ethylbenzene						6.8	6.7
7	toluene	6.7	3.5	6.6		3.8	6.8	8.7
8	1,2-dichloroethane					4.3		
9	trichloroethene	25					12	15
10	total xylenes	24				2.9	37	47
11								
12	**Semi-Volatiles**							
13	Acenaphthylene	36				72	16	26
14	anthracene					8.7		
15	Bis(2-ethylhexyl)phthalate	5.4						
16	m-cresol/p-cresol	13		18		23	15	7.5
17	o-cresol	8		6.1		8.8	13	7.7
18	2,4-Dimethylphenol	6		5.3		12	9.4	7
19	fluoranthene					8.9		5
20	fluorene	44	5.3			49	17	22
21	naphthalene	560	18	140	5.7	440	190	190
22	phenanthrene	53	9			57	23	30
23	phenol	13	36	150		16	24	30
24	pyrene	6.4						
25						7.3		
26	**Metals**							
27	arsenic							
28	barium							

Make 1 for all files

TABLE 2

Toxicity Characteristic Leachate Procedure (TCLP) Compounds

HWNO¹ and contaminant	Casno²	Regulatory level (mg/l)
D018—Acrylonitrile 1	107-13-1	5.0
D004—Arsenic 3	7440-38-2	5.0
D005—Barium 3	7440-39-3	100
D019—Benzene 1	71-43-2	0.07
D020—Bis(2-chloroethyl)ether 2	111-44-4	0.05
D006—Cadmium 3	7440-43-9	1.0
D021—Carbon disulfide 1	75-15-0	14.4
D022—Carbon tetrachloride 1	56-23-5	0.07
D023—Chlordane	57-74-9	0.03
D024—Chlorobenzene 1	108-90-7	1.4
D025—Chloroform 1	67-66-3	0.07
D007—Chromium 3	1333-82-0	5.0
D026—o-Cresol 2	95-48-7	10.0
D027—m-Cresol 2	108-39-4	10.0
D028—p-Cresol 2	106-44-5	10.0
D016—2,4-D	94-75-7	1.4
D029—1,2-Dichlorobenzene 2	95-50-1	4.3
30—1,4-Dichlorobenzene 2	106-46-7	10.8
1—1,2-Dichloroethane 1	107-06-2	0.40
D032—1,1-Dichloroethylene 1	75-35-4	0.1
D033—2,4-Dinitrotoluene 2	121-14-2	0.13
D012—Endrin	72-20-8	0.003
D034—Heptachlor (and hydroxide)	76-44-8	0.001
D035—Hexachlorobenzene 2	118-74-1	0.13
D036—Hexachlorobutadiene 2	87-68-3	0.72
D037—Hexachloroethane 2	67-72-1	4.3
D038—Isobutanol 1	78-83-1	25
D008—Lead 3	7439-92-1	5.0
D013—Lindane	58-89-9	0.06
D009—Mercury 3	7439-97-6	0.2
D014—Methoxychlor	72-43-5	1.4
D039—Methylene chloride 1	75-09-2	8.6
D040—Methyl ethyl ketone 1	78-93-3	7.2
D041—Nitrobenzene 2	98-95-3	0.13
D042—Pentachlorophenol 2	87-86-5	3.6
D043—Phenol 2	108-95-2	14.4
D044—Pyridine 2	110-86-1	5.0
D010—Selenium 3	7782-49-2	1.0
D011—Silver 3	7440-22-4	5.0
D045—1,1,1,2-Tetrachloroethane 1	630-20-6	10.0
D046—1,1,2,2-Tetrachloroethane 1	79-34-5	1.3
D047—Tetrachloroethylene 1	127-18-4	0.1
D048—2,3,4,6-Tetrachlorophenol 2	58-90-2	1.5
D049—Toluene 1	108-88-3	14.4
D015—Toxaphene	8001-35-2	0.07
D050—1,1,1,-Trichloroethane 1	71-55-6	25
D051—1,1,2-Trichloroethane 1	79-00-5	1.2
D052—Trichloroethylene 1	79-01-6	0.07
D053—2,4,5-Trichlorophenol 2	95-95-4	5.8
D054—2,4,6-Trichlorophenol 2	88-06-2	0.30
D017—2,4,5-TP (Silvex)	93-76-5	0.14
D055—Vinyl chloride 1	75-01-4	0.05

[1] Hazardous Waste Identification Number.
[2] Chemical Abstracts Registry Number.

NOTE: For a discussion of wastes affected by land disposal restrictions as defined by the Constituent in Waste Extract List (CCWE), please refer to the Federal Register, Vol. 51, No. 216/Friday, November 7, 1986. For information regarding CCWE analysis, please contact our Technical Service Group.

1 = TCLP Volatile Cmpd
2 = TCLP Acid Base/Neutral Cmpd
3 = TCLP Heavy Metals

Irons June 22, 1988

BETHLEHEM STEEL
Bethlehem, PA

Interoffice Correspondence
Corporate Development and
Human Resources
Environmental Control

June 22, 1988

R606-E5-A272

From: S. D. Irons

To: R. B. Allen

Subject: STATUS REPORT #2 - CHARACTERIZATION OF MATERIALS IN LACKAWANNA IMPOUNDMENTS AND LANDFILL AREAS

Reference: Report, "Preliminary Results to Characterize Materials in Lackawanna Impoundments and Landfill Areas" - Status Report #1 SDIrons to RBAllen, May 17, 1988

As follow-up to the Status Report #1 of May 17, 1988, (see Reference) this report was prepared to transmit supplemental data and results relative to the characterization of materials in the Lackawanna impoundments and landfill areas. These supplemental data include information on (1) additional chemical analyses, (2) Toxicity Characteristic Leaching Procedure (TCLP) testing of selected samples to determine the leachability of metals and organics, (3) laboratory magnetic separation testing to assess the amenability of the Lackawanna waste materials to beneficiation, and (4) an infrared scan to provide a general characterization of organics present in S-1 sludge. Additional testing and characterization are in progress or planned and these results will be reported routinely, generally on a monthly basis.

Supplemental Chemical Analyses - Table 1 gives the supplemental chemical analyses for selected samples. These analyses include data on alkalies, silica, aluminum oxide, nickel and chromium. This information will be useful when assessing the suitability of the Lackawanna solid wastes for recycling. In general, these data show that the levels of alkalies, nickel, chromium, silica and aluminum should not be a major problem when considering recycling. The data on the S-7 impoundment was generated from samples shipped to Bethlehem by Lackawanna personnel for stabilization work. This sample was collected from the top of the S-7 lagoon.

TCLP Testing

Composite samples from S-1, S-2, S-4 and S-6 impoundments were sent to a commercial laboratory, (BLT Technical Services, Inc, Niagara Falls, NY) for a complete scan of leachable metals and organics via the TCLP protocol. Table 2(a) to Table 2(l) present the TCLP data developed by BLT. These data give the analyses for 25 organics and 8 metals, but do ~~not~~ include the acid/base neutral extractable organics associated with a complete TCLP. We are still waiting for data from BLT for all of the organics. These data should be available in several weeks. The data obtained to date on the TCLP testing show that none of the metals or organics in the leachate exceed the regulatory limits.

Laboratory Magnetic Separation Testing

Magnetic separation tests were conducted using a laboratory Davis Tube apparatus to simulate recovery of magnetics in an iron ore pellet plant. For this test work, samples were de-oiled via chloroform extraction and then pulverized to minus 100 mesh. The sample weight was approximately 5 grams. The standard procedure for Davis Tube testing was followed, including a 3 minute test time with the tube at 120 strokes/minute and the maximum setting for the electro-magnet. Table 3 gives the magnetic weight recoveries for the Lackawanna materials. Based on magnetic weight recoveries alone it is noted that impoundment S-6 material is the most ammenable to magnetic separation (65-72% magnetics). Other samples show lesser potential for magnetic separation. We are waiting for the chemical analyses of the magnetic and non-magnetic fractions to access recoveries and rejection percentages of the metallics (Fe, Pb, Zn). We also plan to conduct as-is magnetic separation testing on selected sludge samples to determine whether or not the Lackawanna wastes can be beneficiated to improve their suitability for utilization.

IR Scan of Organics on the S-1 Sludge

A sample of S-1E sludge was extracted using chloroform and the oil collected for analysis by the Research Analytical Chemistry Group. Using infrared qualitative techniques for a general characterization, it was reported that the oil on hot mill sludge S-1E consists of mainly alphatic petroleum oils (that are slightly oxidized) with a small amount of aromatics.

Additional Work

The TCLP testing by BLT Inc. is incomplete at this time and the results on the organic leachables (acid/base neutrals) will be reported later. Work to determine the magnetic separation characteristics of the various sludges and wastes is at the initial bench scale level of study. Future testing may include conducting pilot scale separation tests on materials that are most amenable to treatment. In addition, bench scale flotation testing to determine the potential for de-oiling hot mill sludges is underway and results will be reported when available. Hydrocyclone testing to remove lead and zinc from blast furnace slurry (S-2) will also be run. We are also planning to fund an initial study with BioProcess Engineering to determine the potential for reducing the oil content in sludges by microbial treatment. Other possible work aimed at recycling sludges and waste (Westinghouse, Chemical Waste Management, etc.) may also be initiated. Additional samples will be required for this current and proposed test work and we will be in contact with you regarding plans to obtain samples.

SDIrons

S. D. Irons
Senior Engineer

SDI:nar

Attachments

cc: LMHarbold	DGBays	JDLynn
DGBoltz	THWeidner	

TABLE 1

CHEMICAL ANALYSES OF LACKAWANNA WASTE MATERIALS
(weight %)

Material Identification	H_2O	Oil & Grease*	Fe^{T**}	C^{Free}	CO_3	Ca	Al_2O_3	SiO_2	Na_2O	K_2O	Zn	Ni	Cr
S-1C	11.2	10.0	70.6	0.6	1.5	0.4	0.4	1.5	0.05	0.08	0.09	0.03	0.01
S-2A	36.6	1.7	45.2	6.4	8.0	5.5	1.6	5.0	0.09	0.14	1.3	0.02	0.03
S-4B	17.9	0.4	17.9	9.6	11.5	15.9	6.8	21.1	NA	NA	0.2	NA	NA
S-4D	37.0	0.5	8.0	2.3	33.0	26.8	5.0	18.9	NA	NA	0.5	NA	NA
S-6A	31.5	0.6	48.2	1.5	7.0	9.7	1.0	4.5	0.09	0.11	0.6	0.02	0.03
S-7	45.0	7.2	29.0	8.6	16.0	10.0	2.1	1.2	NA	NA	3.9	NA	0.10
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

* Chloroform extractables in Soxhlet Apparatus. Reported on water free basis.
** All chemical analyses reported on a dry, oil-free basis.

TABLE 3

RESULTS OF LABORATORY MAGNETIC SEPARATION STUDIES USING A DAVIS TUBE
(weight %)

Sample Identification	Fe^{Total}	Magnetics	Magnetic Fraction*			Non-Magnetic Fraction*			% Recovery/Rejection*		
			Fe	Pb	Zn	Fe	Pb	Zn	Fe	Pb	Zn
S-1C	70.6	23.5									
S-1D	55.1	26.6									
S-1E	61.5	28.5									
S-2A	45.2	26.4									
S-2B	38.7	9.8									
S-4B	17.9	18.5									
S-4C	8.1	1.7									
S-4D	8.0	1.4									
S-6A	48.2	65.3									
S-6B	49.2	66.2									
S-6C	49.2	71.7									
[redacted]											
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									
[redacted]	[redacted]	[redacted]									

* Data not available at this time

Table 2 (a)

TECHNICAL SERVICES, INC.
4020 Royal Avenue, Niagara Falls, New York 14303 • Phone (716) 285-2587

Date: June 1, 1988

ELAP #10797

ANALYSIS FOR: Bethlehem Steel Corp.
Accounting Department
Box 5000
Bethlehem, PA 18016

BLT# 2101-02

Sample ID	Test Method		Detection Limit ppm	Results ppm
S-1 Lagoon	Arsenic	EPA SW-846 (206.2)	0.010	<DL
	Barium	" " (208.1)	0.20	<DL
	Cadmium	" " (213.1)	0.01	<DL
	Chromium	" " (218.1)	0.01	<DL
	Lead	" " (239.1)	0.50	0.69
	Mercury	" " (245.1)	0.0002	0.0006
	Selenium	" " (270.2)	0.002	0.008
	Silver	" " (272.1)	0.01	<DL

Extraction Method Reference: EPA SW-846 1310 (EP Toxicity)
Digestion Method. SW-846 (3010)

QA/QC Beverly A. Cavagnaro
Quality Control Officer
Beverly Cavagnaro

Released By: Husein Sitabkhan
Husein Sitabkhan, Ph.D.

TECHNICAL SERVICES, INC.
4626 Royal Avenue, Niagara Falls, New York 14303 • Phone (716) 285-2587

Date: June 1, 1988

ELAP #10797

ANALYSIS FOR: Bethlehem Steel Corp.
Box 5000
Bethlehem, PA 18016

BLT# 2101-02

Sample ID	Parameter	Detection limit ppm	Results ppm
22 E 1 Lagoon	Methyl Ethyl Ketone	.05	<DL
	Methyl Isobutyl Ketone	.05	"
	Nitrobenzene	1.0	"
	Pyridine	.1	"
	Tetrachloroethylene	.05	"
	Toluene	.05	0.08
	1,1,1-Trichloroethane	.05	<DL
	1,1,2-Trichloro-1,2,2-Trifluoroethane	.05	"
	Trichloroethylene	.05	"
	Trichlorofluoromethane	.05	"
	Xylenes	.2	"

Extraction: SW-846(TCLP)
Extraction Method: EPA SW-846(3550) Purge and Trap
Method Procedure: Identification "F" List Waste By GC/MS

QA/QC Beverly A Cavagnaro
Quality Control Officer

Released By: Husein Silabkhan
Laboratory Director

Table 2 (f)

TECHNICAL SERVICES, INC.
4626 Royal Avenue, Niagara Falls, New York 14303 • Phone (716) 285-2587

Date: June 1, 1988

ELAP #10797

ANALYSIS FOR: Bethlehem Steel Corp.
Box 5000
Bethlehem, PA 18016

BLT # 2101-02

Sample ID	Parameter	Detection limit ppm	Results ppm
S-1 Lagoon	Acetone	.05	<DL
	n-Butyl alcohol	1.0	"
	Carbon Disulfide	0.1	"
	Carbon Tetrachloride	.05	"
	Chlorobenzene	.05	"
	Cyclohexanone	.1	"
	1,2-Dichlorobenzene	.1	"
	Ethyl Acetate	.1	"
	Ethyl Benzene	.1	"
	Ethyl Ether	.1	"
	Isobutanol	.5	"
	Methanol	1.0	"
	Methylene Chloride	.1	"

Extraction Method: SW-846(TCLP)
Extraction Procedure: EPA SW-846(3550) Purge and Trap
Method Procedure: Identification "F" Listed Waste by GC/MS

QA/QC Beverly A. Cavagnaro
Quality Control Officer
Beverly Cavagnaro

Released By: Husein Sitabkhan
Husein Sitabkhan, Ph.D.

TABLE 2 - CHARACTERISTICS OF LACKAWANNA S-1 IMPOUNDMENT BASED ON EMPIRE SOILS AND WASTE MANAGEMENT GROUP DATA, WT%

Sample Identification Core Length and #	Color	Fe^{Total}	O&G	C^{Free}	Zn	CaO	-400 Mesh	H_2O
Empire (9')	Brown	81.3	5.0	-	-	-	-	23.6
Empire (7')	Brown	68.0	7.3	-	-	-	22.5	
Empire (11')	Oily	80.0	4.2	-	-	-	14.5	
WM (Surface) S-1A	Oil	66.3	12.0	4.1	0.67	0.37	-	12.0
WM (0-8') S-1C	Black Some Red	70.6	9.9	0.6	0.09	0.35	32.9	11.2
WM (8-16') S-1D	Red w/ Black	55.1	6.5	4.8	0.55	3.9	41.6	26.8
WM (16-24') S-1E	Black	61.5	8.8	1.7	0.21	2.7	36.8	12.0

Materials believed to be disposed in S-1 based on previous information

WQCS #5

WQCS #6

Drums

TABLE 1

CHEMICAL ANALYSES OF LACKAWANNA WASTE MATERIALS
(weight %)

Material Identification	H_2O	Oil & Grease*	Fe^{T**}	C^{Free}	CO_3	Ca	Al_2O_3	SiO_2	Na_2O	K_2O	Zn	Ni	Cr
S-1C	11.2	10.0	70.6	0.6	1.5	0.4	0.4	1.5	0.05	0.08	0.09	0.03	0.01
S-2A	36.6	1.7	45.2	6.4	8.0	5.5	1.6	5.0	0.09	0.14	1.3	0.02	0.03
S-4B	17.9	0.4	17.9	9.6	11.5	15.9	6.8	21.1	NA	NA	0.2	NA	NA
S-4D	37.0	0.5	8.0	2.3	33.0	26.8	5.0	18.9	NA	NA	0.5	NA	NA
S-6A	31.5	0.6	48.2	1.5	7.0	9.7	1.0	4.5	0.09	0.11	0.6	0.02	0.03
S-7	45.0	7.2	29.0	8.6	16.0	10.0	2.1	1.2	NA	NA	3.9	NA	0.10
T-2	1.2	0.1	67.4	0.3	1.0	0.2	3.2	4.1	0.09	<.05	0.01	0.09	0.26
T-5	5.7	<.1	56.0	0.6	7.5	4.4	1.6	4.4	<0.05	<0.05	0.01	0.02	0.05
T-8	29.4	<.1	50.0	0.8	8.0	8.3	0.8	4.6	0.08	0.09	1.1	0.03	0.03
T-10	12.7	0.1	45.2	13.0	4.0	3.4	2.1	8.1	0.07	0.18	0.35	0.02	0.04
T-11	36.7	11.1	3.3	49.7	6.0	1.1	0.2	1.3	<.05	<.05	<.1	NA	NA
T-14	20.7	<0.1	51.5	2.1	9.5	7.4	0.5	2.1	0.06	0.07	1.2	0.03	0.08
T-15	17.2	0.8	43.6	4.4	6.5	6.5	2.5	11.4	0.14	0.33	0.82	0.03	0.07
T-16	18.8	0.8	43.2	7.2	4.5	3.8	3.0	13.0	0.16	0.38	0.99	0.02	0.11

* Chloroform extractables in Soxhlet Apparatus. Reported on water free basis.

** All chemical analyses reported on a dry, oil-free basis.

Table 2 (b)

TECHNICAL SERVICES, INC.
4626 Royal Avenue, Niagara Falls, New York 14303 • Phone (716) 285-2587

Date: June 1, 1988

ELAP #10797

ANALYSIS FOR: Bethlehem Steel Corp.
Accounting Department
Box 5000
Bethlehem, PA 18016

BLT# 2101-03

Sample ID	Test Method		Detection Limit ppm	Results ppm
S-2 Lagoon	Arsenic	EPA SW-846 (206.2)	0.010	<DL
	Barium	" " (208.1)	0.20	<DL
	Cadmium	" " (213.1)	0.01	<DL
	Chromium	" " (218.1)	0.01	<DL
	Lead	" " (239.1)	0.50	<DL
	Mercury	" " (245.1)	0.0002	0.69
	Selenium	" " (270.2)	0.002	<DL
	Silver	" " (272.1)	0.01	<DL

Extraction Method Reference: EPA SW-846 1310 (EP Toxicity)
Digestion Method: SW-846 (3010)

QA/QC Beverly A. Cavagnaro
Quality Control Officer
Beverly Cavagnaro

Released By: Husein Sitabkhan
Husein Sitabkhan, Ph.D.

Table 2 (c)

TECHNICAL SERVICES, INC.
4626 Royal Avenue, Niagara Falls, New York 14303 • Phone (716) 285-2587

Date: June 1, 1988

ELAP #10797

ANALYSIS FOR: Bethlehem Steel Corp.
Accounting Department
Box 5000
Bethlehem, PA 18016

BLT# 2101-04

Sample ID	Test Method			Detection Limit ppm	Results ppm
S-8 Lagoon	Arsenic	EPA SW-846	(206.2)	0.010	<DL
	Barium	" "	(208.1)	0.20	<DL
	Cadmium	" "	(213.1)	0.01	<DL
	Chromium	" "	(218.1)	0.01	<DL
	Lead	" "	(239.1)	0.50	0.69
	Mercury	" "	(245.1)	0.0002	0.0003
	Selenium	" "	(270.2)	0.002	0.008
	Silver	" "	(272.1)	0.01	<DL

Extraction Method Reference: EPA SW-846 1310 (EP Toxicity)
Digestion Method: SW-846 (3010)

QA/QC Beverly A Cavagnaro
Quality Control Officer
Beverly Cavagnaro

Released By: Husein Sitabkhan
Husein Sitabkhan, Ph.D.

Table 2 (d)

TECHNICAL SERVICES, INC.
4626 Royal Avenue, Niagara Falls, New York 14303 • Phone (716) 285-2587

Date: June 1, 1988

ELAP #10797

ANALYSIS FOR: Bethlehem Steel Corp.
Accounting Department
Box 5000
Bethlehem, PA 18016

BLT# 2101-01

Sample ID	Test Method			Detection Limit ppm	Results ppm
S-6 Lagoon	Arsenic	EPA SW-846	(206.2)	0.010	<DL
	Barium	" "	(208.1)	0.20	<DL
	Cadmium	" "	(213.1)	0.01	<DL
	Chromium	" "	(218.1)	0.01	<DL
	Lead	" "	(239.1)	0.50	0.99
	Mercury	" "	(245.1)	0.0002	<DL
	Selenium	" "	(270.2)	0.002	0.023
	Silver	" "	(2/2.1)	0.01	<DL

Extraction Method Reference: EPA SW-846 1310 (EP Toxicity)
Digestion Method: SW-846 (3010)

QA/QC Beverly A Cavagnaro
Quality Control Officer
Beverly Cavagnaro

Released By: Husein Sitabkhan
Husein Sitabkhan, Ph.D.

Table 2 (g)

TECHNICAL SERVICES, INC.
4626 Royal Avenue, Niagara Falls, New York 14303 • Phone (716) 285 2507

Date: June 1, 1988

ELAP #10797

ANALYSIS FOR: Bethlehem Steel Corp.
Box 5000
Bethlehem, PA 18016

BLT# 2101-03

Sample ID	Parameter	Detection limit ppm	Results ppm
S-2 Lagoon	Methyl Ethyl Ketone	.05	<DL
	Methyl Isobutyl Ketone	.05	"
	Nitrobenzene	1.0	"
	Pyridine	.1	"
	Tetrachloroethylene	.05	"
	Toluene	.05	0.09
	1,1,1-Trichloroethane	.05	<DL
	1,1,2-Trichloro-1,2,2-Trifluoroethane	.05	"
	Trichloroethylene	.05	"
	Trichlorofluoromethane	.05	"
	Xylenes	.2	"

Extraction: SW-846(TCLP)
Extraction Method: EPA SW-846(3550) Purge and Trap
Method Procedure: Identification "F" List Waste By GC/MS

QA/QC Beverly A. Cavagnaro
Quality Control Officer

Released By: Husein Sitabkhan
Laboratory Director

Table 2 (h)

TECHNICAL SERVICES, INC.
4626 Royal Avenue, Niagara Falls, New York 14303 • Phone (716) 285-258

Date: June 1, 1988

ELAP #10797

ANALYSIS FOR: Bethlehem Steel Corp.
Box 5000
Bethlehem, PA 18016

BLT # 2101-03

Sample ID	Parameter	Detection limit ppm	Results ppm
S-2 Lagoon	Acetone	.05	<DL
	n-Butyl alcohol	1.0	"
	Carbon Disulfide	0.1	"
	Carbon Tetrachloride	.05	"
	Chlorobenzene	.05	"
	Cyclohexanone	.1	"
	1,2-Dichlorobenzene	.1	"
	Ethyl Acetate	.1	"
	Ethyl Benzene	.1	"
	Ethyl Ether	.1	"
	Isobutanol	.5	"
	Methanol	1.0	"
	Methylene Chloride	.1	"

Extraction Method: SW-846(TCLP)
Extraction Procedure: EPA SW-846(3550) Purge and Trap
Method Procedure: Identification "F" Listed Waste by GC/MS

QA/QC Beverly A. Cavagnaro
Quality Control Officer
Beverly Cavagnaro

Released By: Husein Sitabkhan
Husein Sitabkhan, Ph.D.

Table 2 (j)

TECHNICAL SERVICES, INC.

4626 Royal Avenue, Niagara Falls, New York 14303 • Phone (716) 285-2587

Date: June 1, 1988

ELAP #10797

ANALYSIS FOR: Bethlehem Steel Corp.
Box 5000
Bethlehem, PA 18016

BLT # 2101-04

Sample ID	Parameter	Detection limit ppm	Results ppm
S-4 Lagoon	Acetone	.05	<DL
	n-Butyl alcohol	1.0	"
	Carbon Disulfide	0.1	"
	Carbon Tetrachloride	.05	"
	Chlorobenzene	.05	"
	Cyclohexanone	.1	"
	1,2-Dichlorobenzene	.1	"
	Ethyl Acetate	.1	"
	Ethyl Benzene	.1	"
	Ethyl Ether	.1	"
	Isobutanol	.5	"
	Methanol	1.0	"
	Methylene Chloride	.1	"

Extraction Method: SW-846(TCLP)
Extraction Procedure: EPA SW-846(3550) Purge and Trap
Method Procedure: Identification "F" Listed Waste by GC/MS

QA/QC Beverly A Cavagnaro
Quality Control Officer
Beverly Cavagnaro

Released By: Husein Sitabkhan
Husein Sitabkhan, Ph.D.

Table 2 (k)

TECHNICAL SERVICES, INC.
4626 Royal Avenue, Niagara Falls, New York 14303 • Phone (716) 285-2587

Date: June 1, 1988

ELAP #10797

ANALYSIS FOR: Bethlehem Steel Corp.
Box 5000
Bethlehem, PA 18016

BLT# 2101-01

Sample ID	Parameter	Detection limit ppm	Results ppm
5-6 Lagoon	Methyl Ethyl Ketone	.05	<DL
	Methyl Isobutyl Ketone	.05	-
	Nitrobenzene	1.0	"
	Pyridine	.1	"
	Tetrachloroethylene	.05	"
	Toluene	.05	"
	1,1,1-Trichloroethane	.05	0.11
	I,1,2-Trichloro-1,2,2-Trifluoroethane	.05	<DL
	Trichloroethylene	.05	"
	Trichlorofluoromethane	.05	"
	Xylenes	.2	"

Extraction: SW-846(TCLP)
Extraction Method: EPA SW-846(5030) Purge and Trap
Method Procedure: Identification "F" List Waste By GC/MS

QA/QC Beverly A. Cavagnaro
Quality Control Officer

Released By: Husein Sitabkhan
Laboratory Director

Irons February 6, 1989

BETHLEHEM STEEL
Bethlehem, PA

Tom Widener
215-694-5564
BSC. 6802

Interoffice Correspondence
Corporate Development and
Human Resources
Environmental Control

From: S. D. Irons

To: R. B. Allen

February 6, 1989

R606-ES-A415

ETG
~~APS~~
Info.
Pls. Review,
my ONLY
copy.

trand
RBA
2/14

Subject: CHARACTERIZATION OF MATERIALS IN LACKAWANNA IMPOUNDMENTS AND LANDFILL AREAS - STATUS REPORT #3

References:
(1) Report, SDIrons to RBAllen, Preliminary Results to Characterize Materials in Lackawanna Impoundments and Landfill Areas, May 17, 1988.
(2) Report, SDIrons to RBAllen, Characterization of Materials in Lackawanna Impoundments and Landfill Areas - Status Report #2, June 22, 1988.

General

Efforts to characterize the solids in the Lackawanna impoundments and waste piles in the Golden Triangle area at Lackawanna were initiated in March 1988. An exploratory sampling program was conducted during March with single core samples being collected from impoundments S-1, S-2, S-4 and S-6. In addition, 16 grab samples were collected from the waste piles in the landfill area of the Golden Triangle. The results from chemical and physical tests conducted on these initial samples were reported in Reference 1 & 2. As a next step in our characterization work, a more extensive sampling campaign was conducted from August 29 to September 2, 1988. During this period, 22 holes in total were drilled by split-spoon coring in the seven impoundments and tar pit areas. In addition, four grab samples were collected from waste piles in the landfill area. These samples have been evaluated by both chemical and physical tests. This write-up is a status report covering the new data and discussion on the samples collected in August 1988. Some results relate to the work on the March 1988 samples. Included in the status report are the following:

- All individual samples from the impoundments, tar pits and piles were analyzed to determine constitutent analysis.
- Composite samples from the impoundments and tar pits were evaluated for oxicity characteristics via the TCLP test (volatile compounds, acid/base/eutral compounds, heavy metals) by an outside commercial laboratory.
- TCLP tests were conducted by Analytical Chemistry Group at Research on elected S-3 individual core samples.
- IR scan was conducted on tar pit samples (Analytical Chemistry Group).
- Work was begun to apply treatment techniques to enhance the properties essary for recycling, including 1) conducting 2" diameter hydrocyclone ting on S-2 composite solids, 2) conducting Davis Tube theoretical magnetic

S-1 , S-2, S-4 & S-6 + [illegible]

separation tests on selected individual core samples and 3) initiating a contract to BioProcess Engineering to assess the feasibility of microbially degrading the hydrocarbons in S-1 sludge. Initial results are reported herein.

In addition, work is underway on the following:

- GC/MS studies are being conducted by Air Products on the tar pit samples.
- TGA analyses are being conducted at Research (Refractories Group) on the tar pit samples.

I. Sampling Procedures

During the period August 29 to September 2, 1988, twenty-two core samples in total were collected from the impoundments and tar pits in the Golden Triangle area. Split spoon coring methods were used based on the success of this technique in coring samples in March 1988*. Empire Soils Investigation, Inc. provided the manpower and drilling equipment for conducting the sampling. A track mounted drill was used to core the stable solid wastes, (S-2, S-3, S-4, S-6, S-7 and the tar pits) while a drill positioned on pontoons was used to core the wet, unstable impoundments, (S-1 and S-5). Individual samples of the two inch diameter cores were composted in 0-12', 12-24' and 24-36' increments. Coring continued until the spoon drill could not be advanced.

Sampling of the waste piles near the unused S-8 pit were collected by grab sampling techniques. A backhoe opened a trench at several locations on the piles, and samples were extracted by hand and composited. Four samples were collected from these piles.

II. Physical Details of the Lackawanna Impoundments

Physical characteristics of the seven Lackawanna impoundments are given in Figure 1. Acreage of the individual impoundments based on aerial photography was obtained from Lackawanna personnel. Depths of the impoundments were obtained by averaging core drilling data. Using thse data, the volume of each impoundment was calculated assuming a square area, and a 60° angle for the impoundment embankment. In this calculation, a total volume is calculated (square surface times depth) and then the volume from the four sloping sides is subtracted to yield our volume estimates. In total the seven impoundments contain about 1M cubic yards in the total 25 acres.

III. Map of the Site and Sampling Locations

Figure 2 shows a sketch of the impoundments and waste pile area of the Golden Triangle. Locations of the split spoon core samples collected during both sampling campaigns (March/August 1988) are shown by number. The initial four samples from S-1, S-2, S-4 and S-6 (March 1988) are identified as the #1 cores. Cores in each impoundment taken during August 1988 are sequentially numbered beginning with #2A. A typical identification for a core sample is S-2 core 3A, 3B, 3C meaning impoundment S-2, bore hole 3, sample at 0-12', at 12-24' and at 24-36', respectively.

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* Reference 1

S,3,
S-1, S-2, S-4 & S-6 + S7 + Tar pits.

IV. Sample Preparation and Constitutent Analysis

All samples were placed in plastic buckets when cored and returned to Bethlehem for processing. Cone and quartering techniques were used to take representative samples from the head sample for analysis. Following drying of the initial split sample, further reductions of the sample to 100 gram increments were made using a rotary splitter. Subsequently, samples were submitted for constitutent analysis by the Analytical Chemistry Group at Research. These data are given in Table 1. Portions of samples were used for other studies (size analysis, magnetic testing, etc.). Samples for TCLP testing were composites of all cores taken from each impoundment.

V. TCLP Testing

Eight composite samples from the seven impoundments and tar pits were sent to Lancaster Laboratories, Lancaster, PA for TCLP analysis of 8 heavy metals, 19 TCLP volatile compounds and 16 TCLP non-volatile acid base/neutral compounds. The specific compounds and regulatory levels are given in Table 2. The data from Lancaster Labs are found in Appendix A. To get a/more detailed picture of the leachable heavy metals in the hazardous S-3 impoundmnet, selected core samples from S-3 (1A, 1B, 3A, 3B) were given to the Analytical Chemistry Group at Research for TCLP testing. These results are given in Table 3.

VI. IR Scan of Tar Pit Samples

To learn more about the composition of the material in the tar pits, individual hydrocarbon samples from sixteen extracts were submitted to the Analytical Chemistry Group for an infrared scan. These data showed that the pit samples contain mainly aromatic hydrocarbons with small amounts of oxidized materials and alcohols. The extractables in pit South B were totally different and may be a polyol. These data provided background information on the samples that was used in deciding to request more detailed GC/MS studies on the samples by Air Products.

VII. Enhancement of Sludges to Improve Potential for Recycling

As a first step in assessing whether or not beneficiation methods can be used to enhance the potential for recycling the Lackawanna sludges, magnetic separation, hydrocyclone and biodegradation studies were initiated.

A. Davis Tube Testing and Results

Davis tube tests were conducted on selected samples from both the March and August sampling periods. This procedure is a standard laboratory batch test to determine the theoretical magnetic properties of a material. Three to five grams of samples were deoiled and prepared to minus 100 mesh for testing*. Both magnetic and non-magnetic fractions were analyzed for iron, zinc and lead. Using these results, constitutent recoveries and rejections were calculated. The results are given in Table 4. These data show in general that magnetic recoveries are low with the exception of S-6 and S-7 solids. S-6 data on iron recovery are not consistent and range from 45-78%. The magnetic fraction in S-6 samples have acceptable zinc and lead levels. The zinc levels in S-7 magnetic fractions are still unacceptable.

* Additional details on the test procedures available upon request

B. Hydrocyclone Testing and Results

Processing of blast furnace solids in a hydrocyclone (2" diameter Mosley) is an effective technique for lowering the content of lead and zinc in sludges to acceptable levels (based on experience at Burns Harbor and Sparrows Point). To assess the benefit from hydrocycloning Lackawanna sludges, the pilot circuit shown in Figure 3 was used. To date, limited testing has been conducted with only the S-2 composite solids at 40 and 60 psi feed pressure and about 10% feed solids*. The results of these tests are given in Figure 4. These results show that the hydrocyclone effectively recovered about 70% by weight, at 75% iron recovery while rejecting the lead and zinc by 70% in the overflow. These test results are positive but the zinc and lead levels are still slightly high. A second stage of hydrocloning may further lower the lead and zinc. Hydrocyclone studies are in progress on S-3 impoundment solids.

C. Biodegradation Studies & Results

During late summer, BioProcess Engineering was given a contract to assess the feasibility of microbially degrading the hydrocarbons in S-1 sludge. For this work BioProcess Engineering was given samples of oily sludge and "pure" S-1 surface hydrocarbons. Their initial study consisted of (1) adaptation tests to determine suitability of bacteria for degrading the hydrocarbons, (2) kinetic tests to monitor the progress of the adaptability, (3) extent of degradation tests to evaluate degradation percentages and (4) shake flask tests to evaluate the use of nutrients, surfactants, auxiliary treatment, etc. A report was received in December 1988 on the first phase of the work. The results clearly showed that the natural bacteria can easily degrade 50% of the total hydrocarbons, but these microbes are not suited as-is to degrade the more refractory polycyclic hydrocarbons. Continuation of the funded study will begin in January 1989 to assess methods for stimulating the degradation of the refractory oils by using natural bacteria, or using an inoculated strain of bacteria. The BioProcess Engineering report is available on request from the Waste Management Group.

VIII. Assessment of TCLP and Constitutent Analyses

A. S-1 Impoundment

1. TCLP results on composite - heavy metal and non-volatile compounds are below detectable levels; sample exceeds benzene and trichloroethene regulatory levels and has a high content of 1, 2 dichlorethane.

2. Core Samples

   - S-1 2A (0-9'-10")
     color - intermittent red and black layers from top to bottom
     constitutents - high oil, free carbon, calcium and zinc; moderate iron estimated source of solids - WQCS #5, 6, 7, blast furnace and BOF

---

* Sample collected/shipped by Lackawanna personnel

- S-1 3A (0-15'-6")
  color - mainly red solids with black layers near top
  constitutents - high oil, free carbon, calcium and zinc; moderate iron estimated source of solids - same as Core S-1 2A

B. S-2 Impoundment

1. TCLP results on composite - heavy metal, non-volatile and volatile compounds all below regulatory levels.

2. Core Samples

- S-2 2A (0-12')
  color - alternating red and black layers
  constitutents - high oil, free carbon, calcium and zinc; moderate iron. Low magnetic recovery via Davis Tube.
  estimated source of solids - WQCS #7, blast furnace

- S-2 2B (12-24')
  color - mainly black with red near the top of core
  constituents - high oil, free carbon, calcium and zinc; moderate iron. Poor magnetic recovery via Davis Tube.
  estimated source of solids - same as core S-2 2A

- S-2 2C (24-27'-3")
  color - all black
  constitutents - high oil, free carbon, calcium and zinc; moderate iron. Poor magnetic recovery via Davis Tube.
  estimated source of solids - same as Core S-2 2A

- S-2 3A (0-12')
  color - red brown and black layers
  constitutents - high free carbon, calcium and zinc; moderate iron
  estimate source of solids - same as Core S-2 2A

- S-2 3B (12-24'-8")
  color - mainly black with some red layers
  constitutents - high free carbon, calcium and zinc; moderate iron
  estimated source of solids - same as Core S-2 2A

C. S-3 Impoundment

1. TCLP results on composite - heavy metals, non-volatile and volatile compounds all below regulatory levels
   TCLP results on S-3 1A, 1B, 3A and 3B Cores - all heavy metals below regulatory levels

2. Core Samples

- S-3 1A (0-12')
  color - mainly redish brown with some black layers
  constitutents - high calcium; moderate iron, free carbon and zinc; low oil. Low magnetic recovery via Davis Tube.
  estimated source of solids - WQCS #7 and blast furnace

- S-3 1B (12'24'-5")
  color - redish brown with black layers
  constitutents - high free carbon and calcium; moderate iron and zinc. Low magnetic recovery via Davis Tube.
  estimated source of solids - same as Core S-3 1A

- S-3 2A (0-12')
  color - mainly red brown with black layers
  constitutents - high oil, free carbon, calcium and zinc; moderate iron
  estimated source of solids - same as Core S-3 1A

- S-3 2B (12-24'-8")
  color - mainly red brown with black layers
  constitutents - high oil, free carbon, calcium and zinc; moderate iron
  estimated source of solids - same as Core S-3 1A

- S-3 3A (0-12')
  color - mainly red brown with black layers, also traces of yellow and green
  constitutents - high oil, free carbon, calcium and zinc; moderate iron. Low magnetic recovery via Davis Tube
  estimated source of solids - same as Core S-3 1A

- S-3 3B (12-19'-5")
  color - mainly black with some red brown
  constitutents - high oil, free carbon, calcium and zinc; moderate iron. Poor magnetic recovery via Davis Tube
  estimated source of solids - same as Core S-3 1A

- S-3 4A (0-12')
  color - redish brown with traces of black
  constitutents - high free carbon, calcium and zinc; moderate iron and oil
  estimated source of solids - same as Core S-3 1A

- S-3 4B (12-19'-6")
  color - mainly black with traces of red brown
  constitutents - high oil, free carbon, zinc and calcium
  estimated source of solids - same as Core S-3 1A

D. S-4 Impoundment

1. TCLP results on composite - heavy metals, non-volatile and volatile compounds all below regulatory levels

2. Core Samples

   - S-4 4A (0-12')
     color - all grey brown
     constitutents - high calcium; moderate oil, free carbon and zinc; low iron. Poor magnetic recovery via Davis Tube
     estimated source of solids - dredgings from overflow of BF, BOF and WQCS #7 thickeners

- S-4 4B (12-24')
  color - black, red brown, grey in layers
  constitutents - high oil, iron, free carbon, calcium and zinc. Poor magnetic recovery via Davis Tube
  estimated source of solids - same as Core S-4 4A

- S-4 4C (24-34'-6")
  color - mainly black with grey layers
  constitutents - high oil, free carbon and zinc; moderate iron and calcium. Poor magnetic recovery via Davis Tube
  estimated source of solids - same as Core S-4 4A

- S-4 5A (0-12')
  color - layer of grey, red brown and black
  constitutents - high calcium; moderate free carbon and zinc; low iron
  estimated source of solids - same as Core S-4 4A

- S-4 5B (12-24')
  color - mainly black with red-brown layers
  constitutents - high calcium; moderate free carbon and zinc; low iron
  estimated source of solids - same as Core S-4 4A

- S-4 5C (24-36)
  color - mainly black with grey
  constitutents - high free carbon and zinc; moderate iron and calcium
  estimated source of solids - same as Core S-4 4A

E. S-5 Impoundment

1. TCLP results on composite - heavy metals and non-volatile compounds below regulatory limits; benzene and trichloroethene exceed the volatile regulatory limits

2. Core Samples

   - S-5 1A (0-12')
     color - black on surface, then all red; some white throughout
     constitutents - high oil, free carbon and zinc; moderate iron and calcium. Low magnetic recovery via Davis Tube
     estimated source of solids - heterogeneous mix of WQCS #5, 6, 7 with BF and BOF solids

   - S-5 1B (12-23')
     color - all red
     constitutents - high oil, free carbon and calcium; moderate iron and zinc. Poor magnetic recovery via Davis Tube
     estimated source of solids - same as Core S-5 1A

   - S-5 2A (0-12')
     color - mainly red with some black
     constitutents - high oil, iron, free carbon and calcium; moderate zinc. Acceptable beneficiation via Davis Tube
     estimated source of solids - same as Core S-5 1A

- S-5 2B (12-24')
  color - all red and black
  constitutents - high oil, iron; low free carbon, calcium and zinc. Acceptable beneficiation via Davis Tube
  estimated source of solids - like Core S-5 1A, but with no blast furnace solids

F. S-6 Impoundment

1. TCLP results on composite - heavy metal, non-volatile and volatile compounds all below regulatory limits

2. Core Samples

- S-6 2A (0-12')
  color - all red brown
  constitutents - high iron and calcium; moderate zinc; low oil and free carbon. Low magnetic recovery via Davis Tube
  estimated source of solids - mainly BOF solids with some WQCS #7
- S-6 2B (12-24')
  color - all red brown
  constitutents - high iron and calcium; moderate zinc; low oil and free carbon. Low magnetic recovery via Davis Tube
  estimated source of solids - same as Core S-6 2A
- S-6 2C (24'-35'-8")
  color - all red brown
  constitutents - high iron and calcium; low oil, free carbon and zinc. Low magnetic recovery via Davis Tube
  estimated source of solids - same as Core S-6 2A
- S-6 3A (0-12')
  color - all red brown
  constitutents - high iron, zinc and calcium; moderate free carbon
  estimated source of solids - same as Core S-6 2A
- S-6 3B (12-24')
  color - all red brown
  constitutents - high iron and calcium; moderate free carbon and zinc
  estimated source of solids - same as Core S-6 2A
- S-6 3C (24-35')
  color - all red brown
  constitutents - high iron and calcium; moderate free carbon and zinc
  estimated source of solids - same as Core S-6 2A

G. S-7 Impoundment

1. TCLP results on composite - heavy metals, non-volatile and volatile compounds all below regulatory limits.

2. Core Samples

- S-7 1A (0-12')
  color - red brown with some black
  constitutents - high iron, calcium and zinc; moderate free carbon
  estimated source of solids - mainly WQCS #7, but traces of BF solids

- S-7 1B (12-25'-1")
  color - red brown with some black layers
  constitutents - high iron and calcium; moderate zinc and free carbon
  estimated source of solids - same as Core S-7 1A

- S-7 2A (0-12')
  color - all red brown
  constitutents - high iron, calcium and zinc; moderate free carbon and oil. Poor magnetic recovery via Davis Tube
  estimated source of solids - same as Core S-7 1A

- S-7 2B (12-24')
  color - all red brown
  constitutents - high iron, calcium and zinc; moderate to low free carbon and oil. The low oil content is unexpected, possibly indicating microbial action. Low magnetic recovery via Davis Tube
  estimated source of solids - same as Core S-7 1A

- S-7 2C (24-29'-6")
  color - all red brown
  constitutents - high iron and calcium; moderate free carbon, oil and zinc. Poor magnetic recovery via Davis Tube
  estimated source of solids - same as Core S-7 1A

- S-7 3A (0-12')
  color - red with yellow layers
  constitutents - high iron, zinc, calcium; moderate free carbon and oil. Acceptable magnetic recovery via Davis Tube, but low zinc rejection.
  estimated source of solids - mainly WQCS #7

- S-7 3C (24-27'6")
  color - red brown and black
  constitutents - high iron, calcium, zinc; moderate free carbon; low oil. The low oil content is unexpected, possibly indicating microbial action. Low magnetic recovery via Davis Tube
  estimated source of metals - same as Core S-7 1A

- S-7 4A (0-12')
  color - red brown with minor layers of yellow and black
  constitutents - high iron, calcium, zinc; moderate free carbon
  estimated source of solids - same as Core S-7 1A

- S-7 4B (12-24'-6")
  color - red brown with black layers
  constitutents - high iron and calcium; moderate zinc and free carbon
  estimated source of solids - same as Core S-7 1A

H. Tar Pits

1. TCLP results on composite - heavy metals below regulatory limits; pyridine and benzene exceed regulatory limits. Other volatiles may be high but GC/MS levels of detection set high due to massive amounts of benzene

2. Core Samples

- South Pit A (0-12')
  color - black, with charcoal like solids; traces of blue colors
  constitutents - high carbon, oil, sulfur and calcium; low iron and zinc. IR scan shows mainly aromatic hydrocarbons with some oxidized materials. Other studies still in progress. In a 10% slurry pH is 1.55.

- South Pit B (12-18')
  color - black, grey, white layers
  constitutents - high sulphate, oil and calcium; low free carbon, iron and zinc. In a 10% slurry pH is 1.55. IR scan indicates possibility of polyol. Other studies are still in progress.
  estimated source of solids - coke plant products

- North Pit A (0-14')
  color - black with some beige and white
  constitutents - high oil, free carbon and calcium; low iron, zinc. In a 10% slurry pH is 11.4. IR scan shows mainly aromatic hydrocarbons with some oxidized solids. Other studies are still in progress.
  estimated source of solids - coke plant products

- West Pit A (0-8')
  color - black, white and brown layers
  constitutents - high oil, free carbon, calcium; low iron and zinc. In a 10% slurry pH is 7.45. IR scan shows mainly aromatic hydrocarbons with some oxidized solids. Other studies are still in progress
  estimated source of solids - coke plant products

I. Landfill Grab Samples

- South East
  color - red brown, dark brown, white layers
  constitutents - high iron and zinc; low oil, free carbon and calcium
  estimated source of solids - open hearth

- South West
  color - red brown, dark brown, white layers
  constitutents - high iron and zinc; moderate free carbon and calcium
  estimated source of solids - open hearth

- North East
  color - dark brown, red brown, white
  constitutents - high iron and zinc; low free carbon and calcium
  estimated source of solids - open hearth

- North West
  color - black, red brown, white
  constitutents - high zinc and free carbon; moderate iron, calcium; low oil
  estimated source of solids - open hearth

S D Irons

S. D. Irons
Senior Engineer

SDI:nar

cc: DMAnderson
DGBoltz
WJRiley
LMHarbold
LMStuart
JDLynn

FIGURE 1 - PHYSICAL DIMENSIONS OF LACKAWANNA IMPOUNDMENTS

cups for each

Impoundment Identification	Area (acres)	Average Depth feet	Volume* (yd^3)
S-1	3.90	15.0	90,000
S-2	3.14	26.0	121,000
S-3	5.25	22.1	177,000
S-4	3.46	35.3	174,000
S-5	2.80	23.0	96,000
S-6	2.36	31.9	107,000
S-7	4.50	26.9	181,000
Total	25.41		946,000

* Calculation based on a square shaped lagoon with 60° angled side walls

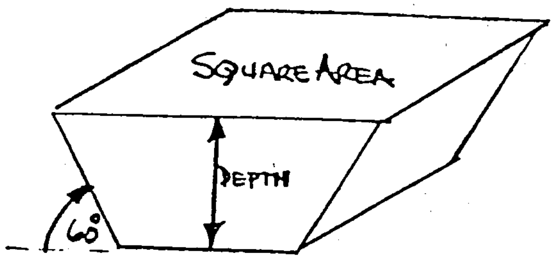

Table 2 (1)

TECHNICAL SERVICES, INC.
4020 Royal Avenue, Niagara Falls, New York 14303 • Phone (716) 285-2587

Date: June 1, 1988

ELAP #10797

ANALYSIS FOR: Bethlehem Steel Corp.
Box 5000
Bethlehem, PA 18016

BLT # 2101-01

Sample ID	Parameter	Detection limit ppm	Results ppm
S-6 Lagoon	Acetone	.05	<DL
	n-Butyl alcohol	1.0	"
	Carbon Disulfide	0.1	"
	Carbon Tetrachloride	.05	"
	Chlorobenzene	.05	"
	Cyclohexanone	.1	"
	1,2-Dichlorobenzene	.1	"
	Ethyl Acetate	.1	"
	Ethyl Benzene	.1	"
	Ethyl Ether	.1	"
	[illegible]	[illegible]	"
	Methanol	1.0	"
	Methylene Chloride	.1	"

Extraction Method: SW-846(TCLP)
Extraction Procedure: EPA SW-846(3550) Purge and Trap
Method Procedure: Identification "F" Listed Waste by GC/MS

QA/QC: Beverly A Cavagnaro
Quality Control Officer
Beverly Cavagnaro

Released By: Husein Sitabkhan
Husein Sitabkhan, Ph.D.

APPENDIX A

1993 ANALYTICAL RESULTS

.SVSCR1

ANALYTICAL CHEMISTRY GROUP
HRL

TCLP SEMIVOLATILE ORGANICS ANALYSIS REPORT
(SCREENING PROTOCOL)

BATCH SERIAL NUMBER: 1180
REQUESTOR/FACILITY: Tom Weidner / Environmental Control
SAMPLE DESCRIPTION: Lackawanna SWMV 27

DATE SUBMITTED: 05/27/93
DATE REPORTED: 06/22/93
ANALYST(S): LMPollock mPollock

		SAMPLE NO. (CONC. IN. PPB)
COMPOUND (CONC. IN PPB)	RCRA LIMIT (PPB)	6819 LM
1,4-DICHLOROBENZENE	7,500	<10.00
2-METHYLPHENOL (O-Cresol)	200,000	<10.00
3&4-METHYLPHENOL (M&P-Cresol)	200,000	<10.00
HEXACHLOROETHANE	3,000	<10.00
NITROBENZENE	2,000	<10.00
HEXACHLOROBUTADIENE	500	<10.00
2,4,6-TRICHLOROPHENOL	2,000	<10.00
2,4,5-TRICHLOROPHENOL	400,000	<10.00
2,4-DINITROTOLUENE	130	<10.00
HEXACHLOROBENZENE	130	<10.00
PENTACHLOROPHENOL	100,000	<50.00
PYRIDINE	5,000	<10.00

YOLSCR1

ANALYTICAL CHEMISTRY GROUP
HRL

TCLP VOLATILE ORGANICS ANALYSIS REPORT
(SCREENING PROTOCOL)

BATCH SERIAL NUMBER: 1180
REQUESTOR/FACILITY: Tom Weidner / Lackawanna
SAMPLE DESCRIPTION: Lackawanna SWMV 27

DATE SUBMITTED: 05/27/93
DATE REPORTED: 06/22/93
ANALYST(S): LMPollock mPollock

		SAMPLE NO. (CONC.IN PPB)
COMPOUND (CONC. IN PPB)	RCRA LIMIT (PPB)	6819 LM
BENZENE	500	<10.00
CARBON TETRACHLORIDE	500	<10.00
CHLOROFORM	6,000	82.4
CHLOROBENZENE	100,000	<10.00
1,2-DICHLOROETHANE	500	<10.00
1,1-DICHLOROETHYLENE	700	<10.00
2-BUTANONE (MEK)	200,000	<200.0
VINYL CHLORIDE	200	<20.00
TETRACHLOROETHYLENE	700	<10.00
TRICHLOROETHYLENE	500	<10.00

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STEEL

ANALYSIS REQUISITION AND REPORT

F3736100 (Rev.D 1-84)

PROJECT NO. TZC-80-93003

DESCRIPTION Lackawanna SWMV 27 (AGL-405-93001) TCLP Screen

DATE SUBMITTED 5/27/93

DATE REPORTED 6/22/93

REPORT BY MP

SUBMITTED BY GC Keiser

REQUESTED BY THWalker

DIVISION CA

PHONE 6002

LAB USE ONLY

	Units		Units	Ser. No.
ISTR.		CHEM.	66	
ORG.		PREP.	70	

LAB USE ONLY	SAMPLE IDENTIFICATION	DETERMINATIONS REQUIRED →	Ag	As	Ba	Cd	Cr	(5ppb) Hg	Ni	Pb	Se		Semivolatile Organics ✓		Volatile Organics ✓					
0819 LM	Lack. SWMU 27	Analysis Req'd.*																		
		Lab Analysis																		
		Report Values**	<.25	<.5	<5	0.006	<.25	<5	<1	<.5	<.5									
		Analysis Req'd.*																		
		Lab Analysis																		
		Report Values**																		
		Analysis Req'd.*																		
		Lab Analysis																		
		Report Values**																		
		Analysis Req'd.*																		
		Lab Analysis																		
		Report Values**																		
		Analysis Req'd.*																		
		Lab Analysis																		
		Report Values**																		

SPECIAL INSTRUCTIONS

✓ please see attachments for semivolatile and volatile organic analyses results

LAB USE ONLY

notebook + V2 + V2, TCLP V1, #142, ZHE #1 1180

* Indicate Analysis requir... check marks in upper right corner of Analysis Req'd. block, and insert approximate composition, if known.

Focus on the Vision
Be The Premier Steel Company

BETHLEHEM STEEL CORPORATION
Safety, Health and Environment
Environmental Affairs

August 8, 1997

FROM: T. H. Weidner

TO: N. B. Franco

SUBJECT: **Excavation and Screening Tests on Lackawanna S-5 Impoundment Sludge**

Ref: Letter, R. B. Allen to F. E. Shattuck, May 20, 1997

As part of the development for the BSSE project and as described in the letter to NYDEC (reference), we arranged for obtaining samples from S-5 impoundment and the testing of two screening devices on these samples. The excavation of the samples occurred during the week of June 23, while the screen testing took place the week of July 21. Following is the description of the activities:

1. Preparation for Running Tests - Prior to conducting any testing, several activities were required to facilitate running the tests in a technically viable and environmentally correct manner.

   a. An office trailer was rented by Larry Platz and laboratory equipment was supplied from HRL and installed in the trailer to conduct percent moistures at the site.

   b. Other equipment was also shipped from HRL to collect and weigh screen oversize and wet screen the oversize.

   c. A water supply system was put together at the de-contamination pad (this pad was originally installed by Metcalf & Eddy for their Acid Tar Pit project). Since no water is available in this part of the plant, water was trucked in and transferred into 3 - 1,000 gal. tanks. The tanks were manifolded to a centrifugal pump to supply water for washing equipment and for wet screening the screen oversize.

   d. A sump pump was installed to pump the collected dirty water from the de-contamination pad to a 1,000 gal. collection tank for future disposal.

   e. The lime plant pad was cleared of vegetation and the cracks in the concrete were filled in with asphalt patch and sealer.

2. Removal of Ponded Water on S-5 - Based on the chemical analyses and physical properties of the sludges in S-1 and S-5 plus estimates of the amounts of ponded water on S-1 and S-5 (500,000 gal. vs 75,000 gal.), it was decided to pump the water from S-5 to S-1 and excavate materials only from the S-5 impoundment for the screening tests. Larry Platz contracted with Superior to transfer the water. This was accomplished with a vacuum truck and occurred on June 19, 20, 23, and 24. Problems were encountered in positioning the

hose into all the low areas of the impoundment because access was restricted by the very poor load-bearing properties of the sludge at the north end. Because of this problem plus rain on Tuesday, June 24, some pools of water remained on the surface when the excavation took place. Another problem was that as the water level on the surface of the impoundment became low, the tendency of the vacuum truck was to suck not just water but also some solids and oil since the material on the surface had the properties of a flowable slurry rather than a firm sludge. Another observation was that when the truck was being cleaned after the water transfer was completed, considerable slag particles were found inside the vacuum truck.

3. <u>Excavation of Samples</u> - The original plan was to excavate 12 ten ton samples from the impoundment at six locations, each at two depths. We ended up with only 11 samples when a deep sample could not be obtained at one location because of the fluid property of the material at that site. Attachments 1 and 2 present the sample designation and approximate location of the 11 samples. The excavation was conducted by John's Lakeview Co. using an extended boom Komatsu backhoe. Samples were taken at about 5 and 15 foot depths. When the proper depth was achieved, the excavator loaded the material into a dump truck for transfer to the lime plant pad. After dumping the sludge samples, the individual piles were covered with a tarpaulin and absorbent pigs were placed around the base of the piles to collect any water or oil run-off. Essentially, we observed no seepage of water or oil from any of the samples, even those with moisture contents of 40-55%.

4. <u>Sample Characterization</u> - After excavation, the samples were classified as to color and appearance. In addition, thief samples were taken at five locations from the pile and composited in a 5 gal. can. A grab composite was taken from each can and analyzed for percent H_20 in the trailer at the site. The dried samples were sent to Bethlehem for percent oil and grease (% O&G) analyses by the Research Department Analytical Chemistry Group. Attachment 1 presents these data. The percent H_20 ranged from 8.5% to 56.1% and averaged 27.5%. The precent O&G ranged from 1.2% to 18.2% and averaged 10.4%.

   Visual observations of the samples are as follows: (a) there appeared to be a higher percentage of "black" sludge to "red" sludge than had been thought based on previous sampling; (b) sludge in the southern end of the impoundment was generally black, firm and low moisture; (c) the red sludge found on the south-east section of the impoundment was typically clay-like and high moisture; (d) the sludge in the northern-end of the impoundment, which had been under the ponded water, was slurry-like, high moisture but primarily black; (e) in general, for a specific location, the samples at depth (about 15 ft.) were lower in moisture than the shallow samples; (f) at location 4, only a surface sample could be obtained since the sludge was slurry-like and kept flowing into the hole being dug by the excavator; (g) at location 3, a large number of wooden timbers were discovered at about 10 ft. depth - the sludge at this location was also very unstable and the excavator had difficulty in keeping the sludge (slurry) from sluffing into the hole; (h) the surface samples at location 5 (in the bull rushes) had a gray color and analyzed only 1.2% O&G - it did not appear to be a mill sludge; (i) the deep sample at location 6 contained a 55 gal. drum, a 5 gal. can, and a 1 gal. can all filled with what appeared to be white paint - also at this location a 4 ft. diameter metal "button" was dug out but was not included in the sample for screening.

5. Screening Tests - Two screening machines were tested: (1) A Read Corporation Waste Manager W/M 3500, and (2) a grizzly designed and built by the Research Department Engineering Service group. Material was fed to the screens with a New Holland Model 685 front-end loader having a 5 ft. wide bucket. A 4.5 ft. high steel ramp, built by a local contractor, was needed to reach the 11.5 ft. high screens. A "typical" bucket weight was determined for the sludge and the number of buckets fed to the screens during a test was counted to obtain the total weight fed. For those tests where the screens were deemed to be working properly, the oversize was weighed to obtain an "as-is" oversize weight. This material was wet-screened at 2" on the de-con pad and the resultant oversize was weighed to differentiate between real oversize (bricks, slag, metal, etc.) and unbroken lumps of sludge. These data are presented in Attachment 3.

   a. Read W/M 3500 - This unit is a commercial machine having a screen surface area of 12 ft. x 7 ft. It consists of three decks of "fingers"; the spacing between the fingers was 1.5 inches. The machine can be operated with a forward "throw" to move oversize off the screen deck or a reverse "throw" to keep oversize material on the decks. A portion of the Read brochure is Attachment 4. Four tests were run with the Read machine. A total of five different samples were tested. Total weight of sludge screened was about 57,600 pounds. No blinding of the screen was observed or build-up of sludge on the screen "fingers." For two of the black sludge samples, the machine worked best in the forward throw mode. Oversize weights of 4.3% and 1.4% were measured of which 2.3% and 0.7% were determined to be real oversize and 2.0% and 0.7% were unbroken lumps. For sample 2S, a red clay-like sludge, the screen worked best in the reverse throw mode; no oversize was obtained from 12,000 lbs. of feed material. Overall, the screener performed quite well.

   b. HRL Grizzly - This unit was built with two air vibrators under the decks to impart a shaking motion. The slope of the decks was variable in five steps from horizontal to 40° from the horizontal. A drawing of the grizzly is presented on Attachment 5. Three decks were available: a 2" x 5" punch plate, a 6" x 11" punch pate, and a wire rope deck with 2" openings. Tests were not run with the 6" x 11" deck since the Read machine had already demonstrated efficiency at a 1.5" opening. When reasonably dry black sludge was fed slowly to the 2" x 5" deck, most of the undersize went through the decking. For wetter black and red sludges, or when full buckets of sludge were dumped onto the deck, material built up on top of the screen. Some undersize did continuously pass through the screen, however, at a very slow rate. This deck worked better at a steep slope than in a flat position. The piled up material on the deck was easily pushed through with the bucket from the backhoe. The wire rope deck worked better than the punched plate deck. However, material tended to build-up at the support cross members under the deck and the wires were pushed apart by large pieces and lumps of sludge. This deck also worked best if fed slowly and at a steep angle. No oversize weights were obtained during these tests because of the build-up on the screen.

6. Post Test Cleanup - After completion of the tests, all test materials were trucked back to S-5 and dumped into the southwest corner of the impoundment at the back-up beam. The lime plant pad was scraped with the New Holland bucket to remove any loose sludge. The Read screen, New Holland, dump truck, and backhoe were washed with a high pressure washer on the de-con pad. The dirty water from the de-conning was returned to S-5 via a vacuum truck. The contaminated stone on the de-con pad plus the tarps and pigs ~~were~~ HAVE BEEN taken off-site to a landfill.

LOADED IN A ROLL-OFF & WILL BE

7. Conclusions - The Read Waste Manager W/M 3500 demonstrated the capability to remove plus 1.5" oversize from all types of sludge excavated from S-5 while passing the minus 1.5" sludge without blinding. About half of the oversize was unbroken lumps of sludge. The capacity of the machine could not be determined but bucket loads of 1,500 lbs. did not overload the unit. The W/M 3500 will be able to screen sludge "as-excavated" for both the demonstration plant and any future commercial sized facility.

   One potential problem will be that materials with a high aspect ratio, such as slivers of wood, etc., may pass through the screen and present problems with the feeder at the BSSE plant. A method of dealing with these occasional materials may have to be designed into the BSSE feed system.

   The punched plate grizzly, as tested, could work if the material was occasionally pushed through the deck with a front-end loader or backhoe bucket. The wire rope deck has promise, but additional development design work would be needed to prevent the wires from opening and to impart a more effective vibration method. Because the Read machine is proven, this development work is not recommended at this time.

   The average percent O&G and percent H_20 of the sludge samples excavated from S-5 were similar to analyses of previous samples and drill cores. There appears to be more black sludge than previously estimated which generally means higher iron content and lower impurity, such as zinc, content. The sludge on the surface on the north end of the impoundment, where the ponded water had been, was very wet and "slurry like" and could not be prevented from sluffing into holes dug by the excavator.

8. Recommendations - For the demonstration plant in 1998 (and 1999, if needed), I recommend a Read W/M 3500 be rented. Assuming the ponded water on S-1 and S-5 can be pumped off in early spring, an extractor feeding a Read machine directly can process enough material in one month to be able to feed the 10 tpd demonstration plant for the entire year. I recommend the undersize from the Read machine be trucked to the lime plant pad for staging.

   From our testing, I recommend that the excavated material be run over the W/M 3500 working in its forward throw mode. The oversize could be collected and staged and periodically reprocessed with the machine in its reverse throw mode. This should clean up the oversize and minimize the loss of unbroken sludge lumps in the oversize product. The final, re-cleaned oversize could then be disposed of either on-site or off-site (depending on the agencies' ruling).

   From the discussion with Rudy Vukas of Read, we understand the monthly rental fee for a W/M 3500 is $10,000 plus transportation costs. However, this assumes an availability of a W/M 3500 machine. Currently, the only available unit is the one we tested at Lackawanna. Consideration should be given to finding a way to ensure that a Read machine will be available next spring. (Purchase price of the used machine is $147,500 and a new machine is $175,000).

For full-scale screening, the Read machine should also be used. An excavation plan will be needed. A preliminary concept discussed with Jim Scherer would involve excavation of the road which runs along the south side of S-1 and S-5 down to the sludge level. A long arm backhoe would then remove the sludge that could be reached from this location. This process would then be continued until the excavator reached the bottom of the impoundment. Care would have to be taken not to have the excavator working at a vertical sludge face because of the danger of the approximately 20-25 foot face collapsing onto the excavator. I suggest we have Rust begin to develop this excavation plan and to cost it out.

T. H. Weidner
T. H. Weidner

Attachments

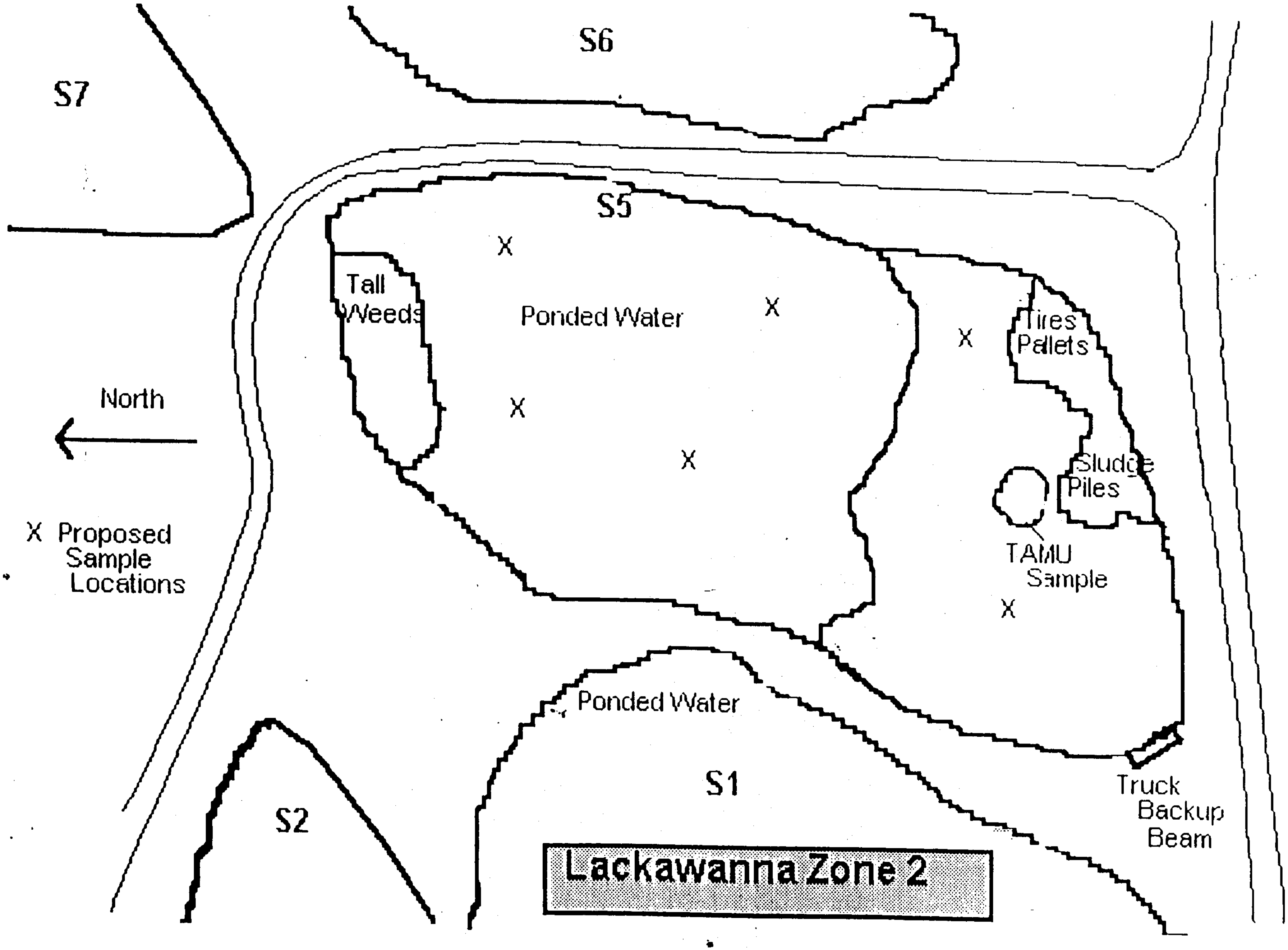
cc: R. B. Allen
L. M. Stuart
D. F. Piersza
E. G. Bauer
A. M. Caram
G. C. Keyser
J. D. Lynn
L. E. Platz
Ken Goldbach - Rust Environment & Infrastructure
Abid Bengali - Rust Environment & Infrastructure

Attachment 1

S-5 Dredge Samples (6/97)

Sample No.	Approx. Location	Approx. Depth (ft.)	Color	Appearance	% H_20	% O&G	Fe	C	Zn	CaO	SiO_2
1-S	SE	5	Red/Black	Firm	17.5	11.3	61.4	2.0	0.20	4.0	3.6
1-D	SE	18	Black	Firm	10.2	11.4	68.2	1.0	<0.10	1.4	2.8
2-S	E	5	Red	Clay-like	41.2	7.9	44.8	4.5	0.36	12.3	4.1
2-D	E	12	Red/Black/ White	Firm	26.7	12.2	46.1	6.3	0.17	12.9	5.2
3-S	W-Middle	3 - 5	Black	Semi-fluid	56.1	10.7	58.1	6.4	0.36	3.2	3.7
3-D	W-Middle	5 - 10	Black	Wet	15.7	10.8	63.9	3.7	0.16	1.8	2.9
4-S	N	Surface	Black	Slurry	51.0	18.2	16.9	24.5	0.93	15.1	11.2
5-S	NW	5	Black/Gray	Firm	32.4	1.2	9.6	10.6	0.31	6.8	41.4
5-D	NW	15	Red/Black/ Gray	Firm	34.1	10.3	37.3	12.4	0.39	7.3	13.5
6-S	SW	5	Black	Dry	8.5	11.1	67.0	1.6	<0.10	0.4	2.3
6-D	SW	15	Black	Dry	8.9	9.8	67.3	3.0	0.75	0.4	2.0
				Average	27.5	10.4	49.1	6.9	0.34	6.0	8.4
					Ave w/o 4-S, 5-S		62.5	5.3	0.31	6.0	5.4

Attachment 2



Attachment 3

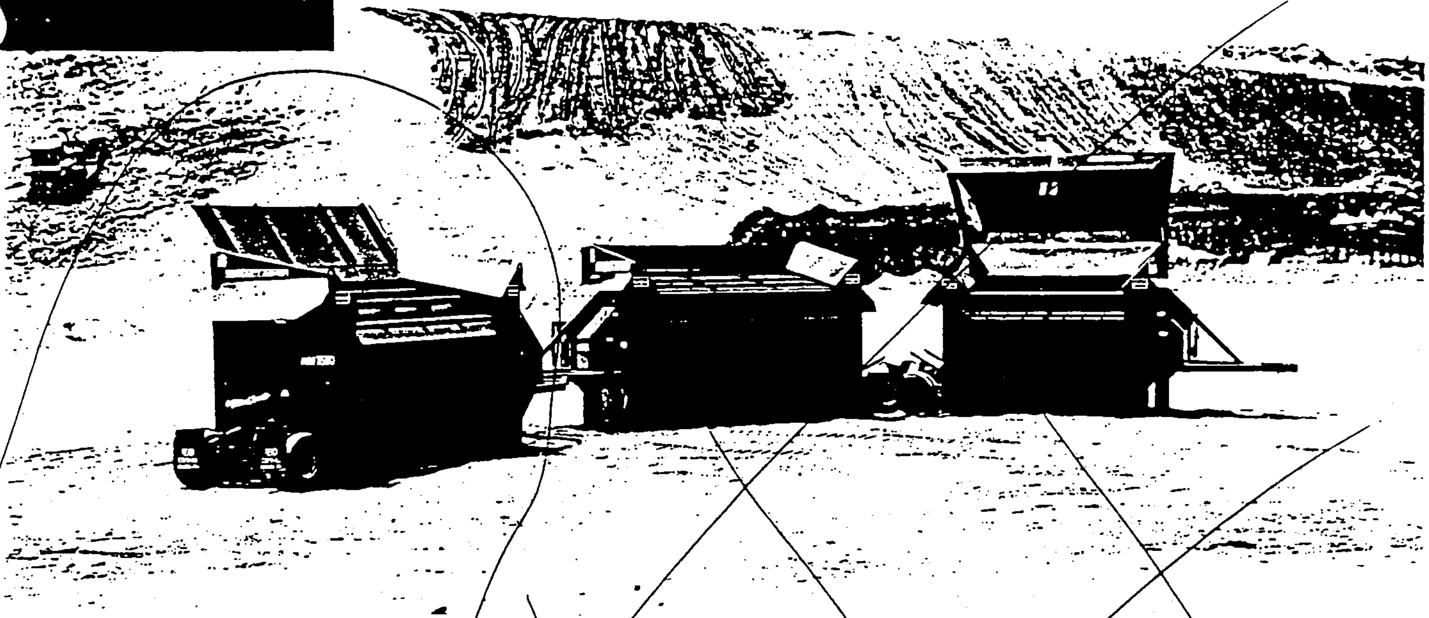
Summary of S-5 Material Screening Tests

Test No.	Screen Machine	Feed Materials	Amount Fed (lbs.)	As Is Oversize		Washed Oversize		Comments
				Wt (lbs)	%	Wt (lbs)	%	
1	Read W/M 3500	6D	22,500	964*	4.3	510*	2.3	Oversize included a 55 gal. drum, a 5 gal. pail and a 1 gal. paint can.
2	Read W/M 3500	25	12,000	See Comments				First 3 buckets fed w/machine "throw" in forward position. Some lumps of sludge discharged. Beginning w/4th bucket machine throw in reverse - no oversize obtained.
3	Read W/M 3500	4-S	15,000	209	1.4	102	0.7	Machine in reverse throw for first 3 buckets. No oversize discharged. When machine changed to forward, throw oversize material discharged.
4A	Read W/M 3500	5-S	3,600	Not Measured				Some lumps discharged.
4B	Read W/M 3500	6-S	4,500	Not Measured				--
5A	2"x5" Grizzly	6-S	12,000	Not Measured				Material tended to build-up on screen - could be pushed through with loader bucket.
5B	2"x5" Grizzly	3-S	1,200	Not Measured				
6A	2" Wire Grizzly	6-S	4,500	Not Measured				Material passed through screen when fed slowly but tended to build up on screen.
6B	2" Wire Grizzly	3-S	3,000	Not Measured				
6C	2" Wire Grizzly	5-D	2,400	Not Measured				
6D	2" Wire Grizzly	1-D	3,000	Not Measured				

* Includes a drum weighing 156 lbs.

Attachment 4

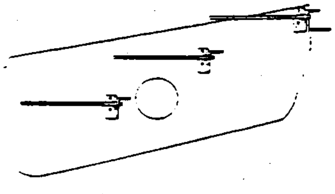
Made in U.S.A.



W/M 3500
(Shown with casting plate)

Overall Length	28'0"	8.53 m
Height (Travel)	12'3"	3.73 m
Width (Hauling)	7'10"	2.39 m
*Weight	23,591 lb.	10700 kg
Approx. Fuel Consumption(8 hrs.)	21 gal.	79.5 l
Fuel Capacity (tank)	50 gal.	189.3 l
Surface Area	12' x 7'	3.66 m x 2.13 m
Opening for Bucket	14'8"	4.47 m
Capacity in Opening	18 cu. yds.	13.76 m
Loader Capacity (bucket size)	5-8 cu. yds.	3.82 m - 6.12 m
Towing Arrangement	Fifth Wheel	
Brakes	Air	
Engine Make	John Deere, 3 cyl. 3179D	
Engine Type	Water Cooled, Diesel	
Horsepower	49 @ 1,950 rpm	
Shakerhead Decks	1 deck	

*Note: All weights are approximate

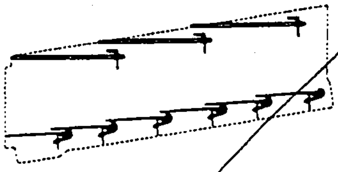


(crossection of shakerhead)

W/M 3000

Overall Length	28'0"	8.53 m
Height (Travel)	12'3"	3.73 m
Width (Hauling)	7'10"	2.39 m
*Weight	24,080 lbs.	10923 kg
Approx. Fuel Consumption (8 hrs.)	21 gal.	79.5 l
Fuel Capacity (tank)	50 gal.	189.3 l
Surface Area	12' x 7'	3.66 m x 2.13 m
Opening for Bucket	14'8"	4.47 m
Capacity in Opening	18 cu. yds.	13.76 m
Loader Capacity (bucket size)	5-8 cu. yds.	3.82 m - 6.12 m
Towing Arrangement	Fifth Wheel	
Brakes	Air	
Engine Make	John Deere, 3 cyl. 3179D	
Engine Type	Water Cooled, Diesel	
Horsepower	49 @ 1,950 rpm	
Shakerhead Decks	2 decks	

*Note: All weights are approximate

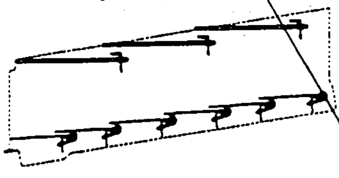


(crossection of shakerhead)

W/M 2000
(*W/M 2005 Shown with Ultra-Feed™ System)

Overall Length	25'8"	7.82 m
Height (Travel)	11'8"	3.56 m
Height (Travel w/Ultra-Feed)	12'1"	3.68 m
Width (Hauling)	7'10"	2.39 m
*Weight	19,480 lbs.	8836 kg
* Weight (w/Ultra-Feed)	23,160 lbs.	10505 kg
Approx. Fuel Consumption (8 hrs.)	10 gal.	37.85 l
Fuel Capacity (tank)	14 gal.	53.00 l
Surface Area	10' x 6'6"	3.05 m x 1.98 m
Opening for Bucket	12'6"	3.81 m
Capacity in Opening	15 cu yds.	11.46 m
Loader Capacity (bucket size)	3-5 cu. yds.	2.3 m - 3.8 m
Towing Arrangement	Fifth Wheel.	
Brakes	Air	
Engine Make	Lister, 3 cyl. TX-3	
Engine Type	Air Cooled, Diesel	
Horsepower	36 @ 2,100 rpm	
Shakerhead Decks	2 decks	

*Note: All weights are approximate



(crossection of shakerhead)

Authorized Distributor

Read WasteManager™

The Read Corporation 25 Wareham St., Middleboro, MA 02346
Corporate Headquarters: 508-947-5208
Eastern Division: 1-800-992-0145 Western Division: 1-800-237-0547

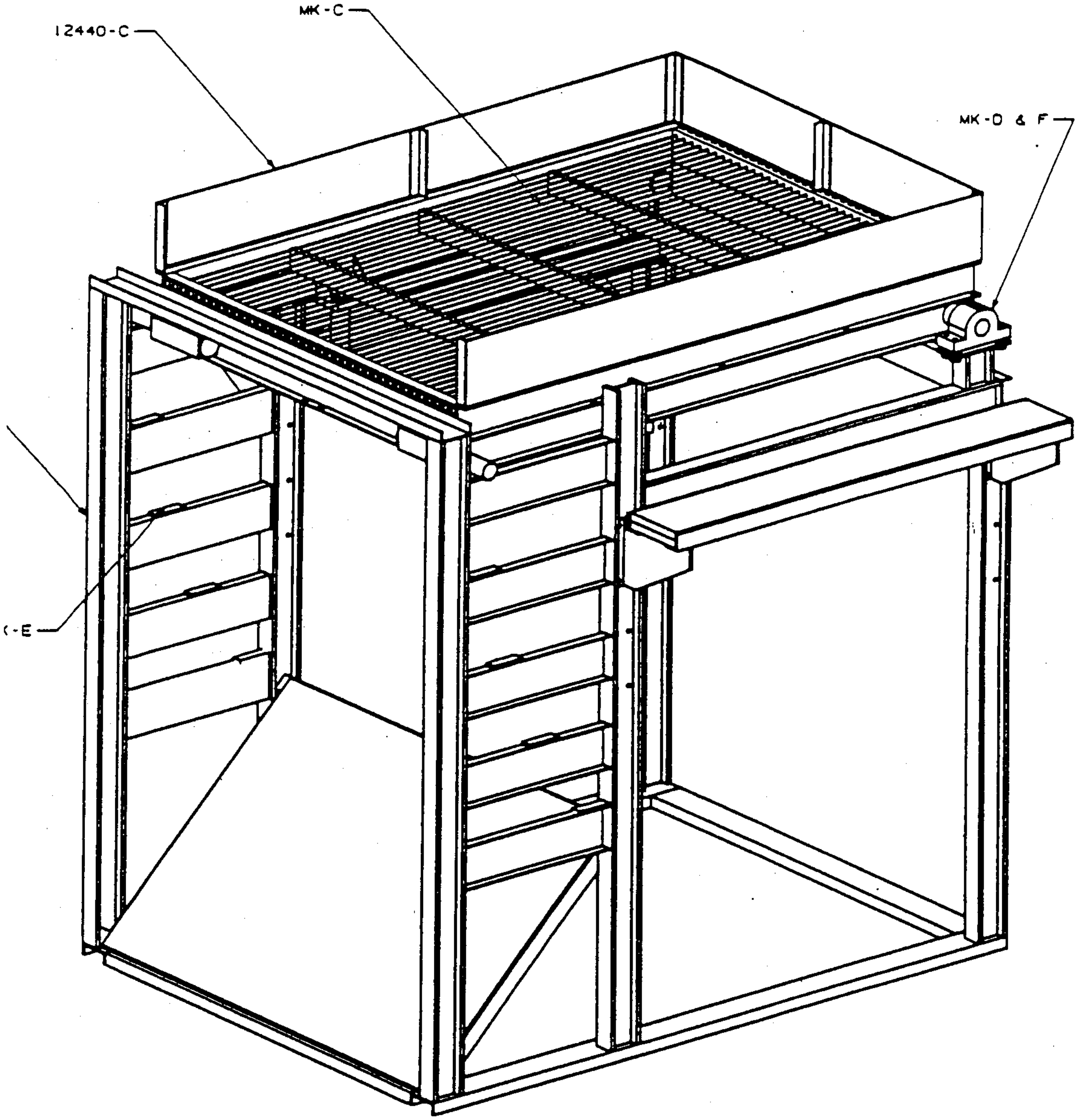
Doc# WM4c9208 Patent #'s 4256572, 4197194, 4237000, D263836

Attachment 5

BILL OF MATERIAL

	0501	1000	6338-9999	64	
					970243
					12436

A	38	1/4-20X3/4" HEX BOLTS	STRONG
B	38	1/4" WIRE ROPE CLIPS 07847163	STRONG
C	1	1/4"X380' GALV WIRE ROPE 67677443	STRONG
D	2	DODGE BEARINGS P4BE300R	BERRY
E	10	ISOLATION PADS 5940K51	MCMASTER
F	8	ISOLATION MOUNTS 6309K37	MCMASTER
G	2	RING GRIPS 98404A755	MCMASTER
H	4	2X12X7' WOODEN BOARDS	LEHIGH



FINISHES ON THIS DRAWING CONFORM TO AISE STANDARDS

TOLERANCES	SYMBOL	A	B	C	D	E	F	G	H	J	K
		4	8	16	32	63	125	250	500	1000	2000

REVISIONS

DECIMAL

DWG. NO.	DESCRIPTION
12437	SUPPORT FRAME DETAILS
12438	CABLE TABLE DETAILS
12439	PUNCH PLATE TABLES
12440	MISCELLANEOUS DETAILS

FRACTIONAL ± 1/64

ANGULAR ± 30 MIN.

LACKAWANNA SLUDGE GRIZZLY
GENERAL ARRANGEMENT

	DATE	INITIALS
DRAWN	5/97	SBS
CH'K'D		
APP'D		

SCALE #1 FOOT

BETHLEHEM STEEL
CORPORATION
BETHLEHEM, PA.

DRAWING NUMBER
12436

REPORT ON DRILL CORE SAMPLING OF LACKAWANNA SOLID WASTE MANAGEMENT UNITS, S2, S3 & S6 CONDUCTED IN OCTOBER 1998

FEBRUARY 5, 1999

BETHLEHEM STEEL

Interoffice Correspondence
Safety, Health and Environment
Environmental Affairs
Technical Programs

February 5, 1999

From: T H Weidner

To: N B Franco

Subject: Drill Core Sampling of Lackawanna S-2/S-3/S-6

Ref: (1) Letter T. H. Weidner to R. B. Allen, Sept. 3, 1998
(2) Letter, S.T. Herman to T.W. Easterly, et. al., Dec. 30, 1998
(3) Letter, S.D. Irons to T.H. Weidner, Feb. 6, 1989

Reference 1(Attachment 1) outlines a proposed action plan for determining the recycleability of selected impoundment sludges at Lackawanna. The plan includes 7 action items. Items 1 and 2, i.e., obtaining an accurate estimate of the volume of sludge in S-2/S-3/S-6 and defining the chemistry and variability of the sludges by a drill core sampling program, were completed . The results are presented in this letter. Item 3, the zinc/lead/alkali model(named the SWIM model) for Burns Harbor, was developed (see reference 2) and is currently under review with Burns Harbor personnel. Items 4-7 have not yet been completed.

Test Program The week of Oct. 12,1998 was scheduled for obtaining drill core samples. Glenn Keyser and I measured , with a 100ft. rule, the dimensions of the 3 impoundments. Sketches of each of the 3 areas are presented in Attachments 2,3,4. Also shown on these Figures is the approximate location of each drill core. The surface area calculated from these measurements plus the depth of the impoundments as determined by the drill coring, were used to calculate impoundment volumes. Using measured bulk densities of the sludge samples(see G.C. Keyser's report of Oct.30,1998, Attachment 5) the tonnage of sludge in each impoundment was calculated.

Empire Soils, Inc (Maxim Technologies) was retained to perform the drill core sampling (Boring logs are provided in Attachment 5a). Maxim also coordinated the splitting, preserving, and packaging of the samples. The procedures for handling and analyzing the samples are presented in Attachment 6. In summary, composites of each drill core were submitted to UpState Laboratories, Inc. for total constituent and SPLP analyses for Beneficial Use Determination(BUD) criteria. Composites of each third of the entire drill core were shipped to HRL's Analytical Services Group for %water, %O&G, and selected total constituent analyses on the dry, de-oiled solids which are needed to evaluate the sludge's potential for recycling to sintering.

Results

1. Impoundment Volumes

The calculation of the volumes/tonnages of sludge in each impoundment is presented in Attachment 7; the tonnages are:

S-2 - 39,400 tons
S-3 - 334,900 tons
S-6 - 55,400 tons

2. Analytical Chemistry

A. Analyses to Determine Recyclability - These results are presented in Attachments 8.9. and 10 for impoundments S-2, S-3, and S-6 respectively. All the data for an impoundment are summarized on the first page of each Attachment. Following this page, for each constituent analyzed, the results are then presented in tabular form by top 1/3, middle 1/3, and bottom 1/3 for each drill hole. These tables show any trends by depth and by location in each impoundment.

Impoundment S-2 Results - The average moisture was 33.9%, with the lowest moisture in the top 1/3; the % water in the middle 1/3 and bottom 1/3 were slightly higher. The average O&G content was 3.08% with wide ranges of analyses - but the highest O&G was uniformly in the middle 1/3 samples. The other constituents analyzed showed fairly consistent results. The average Zn was 1.1% with some variability with depth and location. The presence of 8.6% carbon, plus the other analyses, indicates the primary material in S-2 is blast furnace sludge.

Impoundment S-3 Results - The analyses of the S-3 material is very similar to the S-2 Impoundment results; however, with more variability. Difficulty was encountered in obtaining a sample from the top 1/3 at the S-3-4 drill hole. The split-spoons were essentially empty. The sample shown as the top 1/3 fraction on the tables was taken by hand with a shovel down to about 4 feet. The material at this location was not sludge-like but more semi-solidified. A high zinc analysis , 2.30%, was obtained on this sample which is not typical for the other S-3 samples. The average % zinc in S-3 calculates to be 0.85%(vs. 0.94%)if this sample were excluded. The material in S-3 is concluded to be blast furnace sludge.

Impoundment S-6 Results - The material in S-6 is different from S-2 and S-3 material in that it has low O&G (0.23%) , higher iron (49.8%), lower zinc (0.45%) and lower carbon (2.6%). This material is BOF fume slurry. The one significant trend noted is that the zinc is highest on the top and becomes significantly lower in the bottom of the impoundment. Attention might have to be given to the excavation plan and possibly blending after excavation to produce a material acceptable chemically for sintering.

B. Analyses for BUD - The results of this work are presented in Attachment 11. Analyses conducted include total constituent analyses plus SPLP tests. Also run were CO2, LOI, and CN. Only one sample, S-3-3, showed any organics above detrection level from the SPLP test. Chlorobenzene and chloroform were detected at levels slightly above the detection levels.

Conclusions

1. The calculation of sludge tonnage in the three impoundments supercedes previous estimates and can be used to estimate the mount available for re-use in sintering or other(BUD) applications.

2. The total constituent analytical data on the drill core samples were compared with analyses obtained previously and reported in the S. D. Irons report of Feb. 6, 1989(reference 3). Attachment 12 presents the average analyses from the Irons report which matches very closely the average analyses from the Oct., 1998 drill core sampling program.

3. The analyses needed for any future BUD submittals are now available. Nothing unusual was noted in these analyses; however, the success of future BUD approvals will depend on each specific BUD application.

4. Evaluation of the sludge shows the following:

   (a)Moisture contents of 32-34% water(average) are too high for sinter plant use. Some field drying at the Lackawanna site is most likely needed to reduce the moisture to about 12%.

   (b)The average %O&G levels in S-2 and S-3 of 2.2% and 3.1% respectively may present a problem in sintering. The S-6 level of 0.23% should be acceptable.

   (c)The % zinc levels in the 3 impoundments will be a concern to blast furnace/sinter plant operators. The amount of sludge that can be consumed will be determined by the zinc content and the current level of zinc in the blast furnaces. The S-6 sludge is the lowest of the 3 impoundments.

   (d) Other constituents do not appear to be a problem for sinter plant use.

Recommended Actions

1. Of the 3 impoundments tested, the S-6 sludge has the best chemistry for sinter use; therefore, initial efforts should be directed to transferring this sludge to sinter operations. Discussions need to be initiated with plant personnel to determine how much S-6 material they could consume in sintering. In Attachment 13, an estimate of the impact of using S-6 sludge in the Burns Harbor sinter plant is presented using the SWIM model. For example, if 50 TPD of field dried S-6 sludge were to replace purchased mill scale, the current zinc input to the blast furnace at Burns Harbor of about 0.25 lbs/NTHM would increase by 0.029 lbs/NTHM to 0.279 lbs/NTHM. The SWIM model also predicts that the lead in the sinter plant stack would increase by 7.8 lbs/day and the lead in the SWTP effluent would increase by 0.8 lbs/day. The increased lead in the SWTP outfall can be controlled by operating the new final thickener. In fact, it will significantly reduce lead in the 011 Outfall. The sinter plant stack increase, however, may exceed the Prevention of Significant Deterioration rules and needs to be reviewed with BH Environmental personnel.

2. A trial of field drying the S-6 sludge should be run in the summer of 1999 at Lackawanna. The former Lime Plant concrete pad can be used for the test.

3. Initiate discussions with Burns Harbor, Sparrows Point and accounting on developing the accounting procedures needed for transferring S-6 material to the sinter plants.

4. Request Purchasing investigate the market for the S-6 as well as the S-2 and S-3 materials in the Buffalo area.

T. H. Weidner

Attachments 1 - 13

cc: R.B. Allen
L.T. Kaercher
S.T. Herman
A.M. Caram
J.D. Lynn

ATTACHMENT 1

Bethlehem

ENVIRONMENTAL
AFFAIRS

September 3. 1998

To: R. B. Allen

From: T. H. Weidner

As a follow-up to our conversation on August 26 about starting an effort to reuse some of the impounded sludges at Lackawanna. I prepared the attached proposed list of action items for your review and/or use.

T. H. Weidner
T. H. Weidner

Attachment

cc: S. T. Herman
A. M. Caram
N. B. Franco

Proposed Action Plan to Investigate the Recycle of Impounded Sludges at Lackawanna

---

As a start, focus on the impoundment most readily acceptable for recycling - current available analyses shows this to be impoundment S-6 (no O&G; zinc: 0.2 to 0.7%).

1. Obtain an accurate estimate of the volume of material in S-6.
2. Institute a drill core program to obtain more samples to better define the chemistry variability (Fe, Zn, Pb, alkalies) within the impounded sludge. (I would recommend that similar drill core programs be conducted in S-2 and S-3 when the S-6 drilling was done).
3. Complete the zinc/lead/alkali balance model for Burns Harbor (in progress). When this model is functional, prepare several hypothetical scenarios of recycling the S-6 sludge into the Burns Harbor sinter plant for presentation/discussion with Burns Harbor blast furnace and environmental personnel. Complete same for Sparrows Point.
4. Attempt to get a definitive resolution from Accounting on the "zero" transfer cost concept.
5. Develop an excavation plan for S-6.
6. Investigate with NYDEC the options for field drying the sludge using the concrete pad on the lower level in Zone 2. Obtain information from Burns Harbor on their field drying operation. Investigate in the laboratory the need to cover rail cars or trucks that would be used to transport the partially dried sludge material to Burns Harbor or Sparrows Point to minimize dust losses during shipment.
7. Request Purchasing investigate the sale of the S-6 sludge outside the company. This could be sold to other steel companies for sinter plant use or to other industries (such as additive to cement kilns, in flowable fill, etc.).

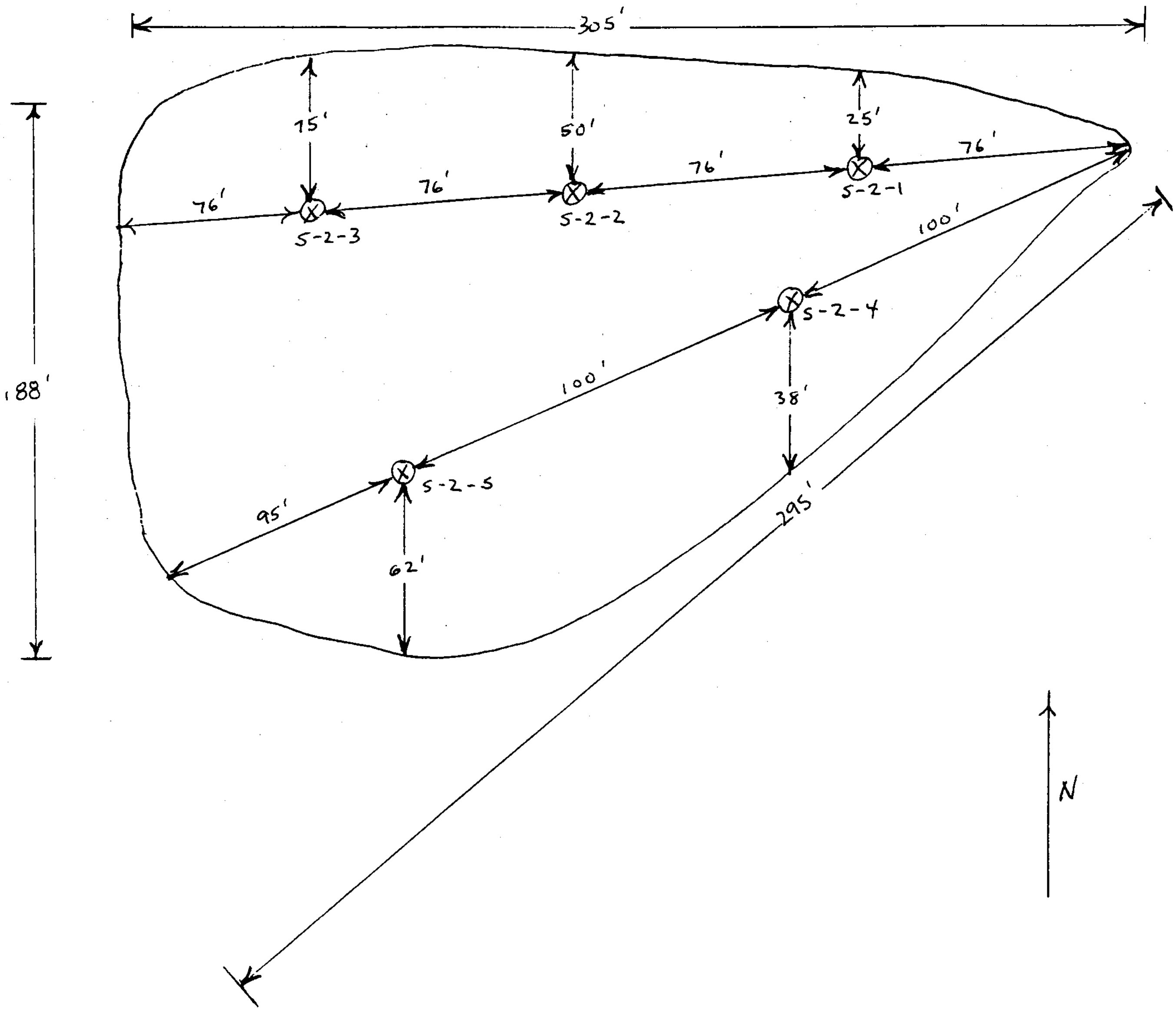
Set a goal of starting the transfer of material by summer of 1999.

TH Weidner

T. H. Weidner
8/27/98

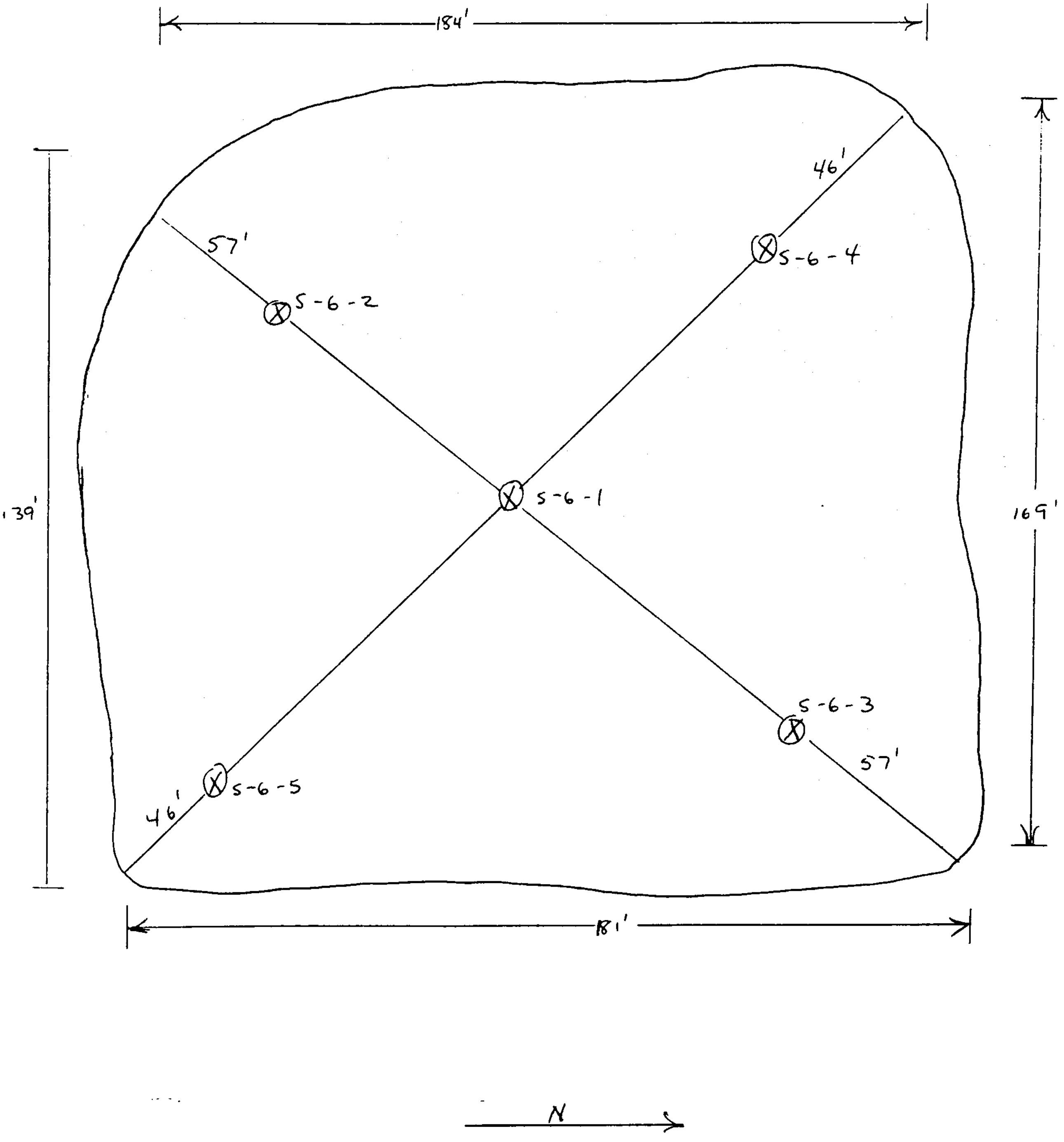
Attachment 2

Lackawanna S-2 Impoundment
Surface Dimensions and Drill Core Locations



Attachment 4

Lackawanna S-6 Impoundment
Surface Dimensions and Drill Core Locations



10/30/98

Attachment 5

Lackawanna S-2, S-3, S-6 Bulk Densities - Made in Split Spoon Drilling Composite

Area	wt./ft.^{3}	wt. of sample	density box-full/partial	Sample date
S-2-1	108.92#	15.26#	full	10/15/98
S-2-2	111.28#	12.42#	partial	10/15/98
S-2-3	111.82#	10.53#	partial	10/15/98
S-2-4	105.18#	6.22#	partial	10/19/98
S-2-5	109.96#	5.54#	partial	10/19/98
Avg	109.4 lb/ft^3			
S-3-1	114.05#	10.19#	partial	10/14/98
S-3-2	105.14#	7.36#	partial	10/15/98
S-3-3	112.53#	10.59#	partial	10/14/98
* S-3-4	108.61#	6.18#	partial	10/15/98
S-3-5	117.19#	8.72#	partial	10/14/98
Avg	111.5 lb/ft^3			

* Composite in 5 gal pail was 0'→10' & 10'→20'. Split spoon sampler did not recover any sample from 2'→6' depth. A small amount of sample from that depth was dug up by hand, but was not included in bulk density determination.

S-6-1	124.41#	17.43#	full	10/13/98
S-6-2	126.55#	17.73#	full	10/13/98
S-6-3	123.48#	17.30#	full	10/13/98
S-6-4	122.34#	17.14#	full	10/14/98
S-6-5	122.91#	17.22#	full	10/14/98
Avg	123.9 lb/ft^3			

Dimensions of the density box used was 4"H × 5 1/8"W × 11 13/16" L. The box was filled in thirds and roughly smoothed out with a trowel. Box was then tapped North, South, East, and West 10 times each to pack sample. Full boxes were smoothed to remove any excess material above the top edge of the box. In the case of partial boxes the entire sample was used, and the top surface smoothed using a 5" wide piece of sheet steel. Four measurements were taken to the top edge of the box to ensure uniformity, and density caculations made from that. Example: depth of box = 4". Distance from top of box to sample = 1½"
4" − 1½" = 2½" of sample. 2½" was then used to calculate bulk density in formula.

ATTACHMENT 5a

SOIL BORING LOGS

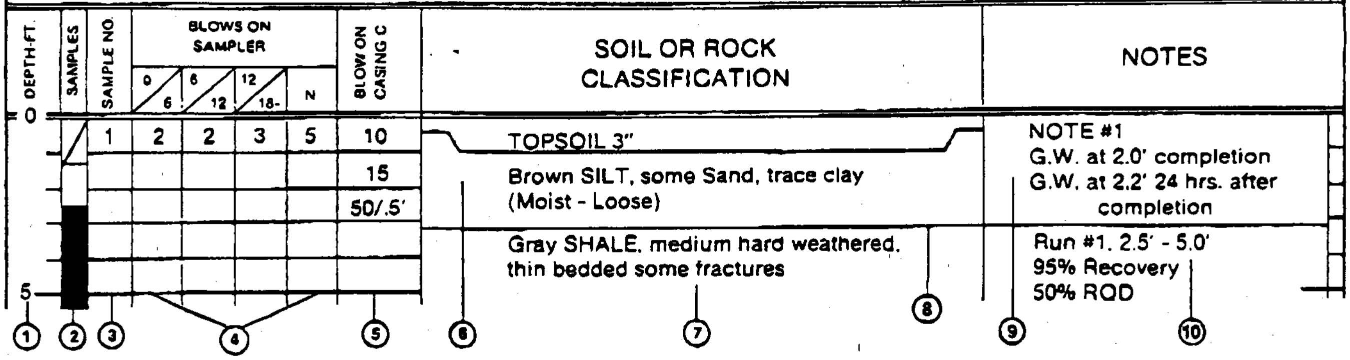
DATE
STARTED 5-1-86
FINISHED 5-1-86
SHEET 1 OF 1

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG

HOLE NO. B-175
SURF. ELEV. 325.6
G. W. DEPTH See Note #1

Project
LOCATION



DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0-6	6-12	12-18-	N	BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0	⧄	1	2	2	3	5	10	TOPSOIL 3"	NOTE #1 G.W. at 2.0' completion G.W. at 2.2' 24 hrs. after completion
							15	Brown SILT, some Sand, trace clay (Moist - Loose)	
	■						50/.5'		
								Gray SHALE, medium hard weathered. thin bedded some fractures	Run #1. 2.5' - 5.0' 95% Recovery 50% RQD
5									

TABLE I

⧄	Split Spoon Sample
◨	Shelby Tube Sample
↕	Auger or Test Pit Sample
■	Rock Core

TABLE II

Identification of soil type is made on basis of an estimate of particle sizes, and in the case of fine grained soils also on basis of plasticity.

Soil Type	Soil Particle Size	
Boulder	> 12"	
Cobble	3" - 12"	
Gravel - Coarse	3" - ¾"	Coarse Grained (Granular)
- Fine	¾" - #4	
Sand - Coarse	#4 - #10	
- Medium	#10 - #40	
- Fine	#40 - #200	
Silt-Non Plastic (Granular) Clay-Plastic (Cohesive)	<#200	Fine Grained

TABLE III

The following terms are used in classifying soils consisting of mixtures of two or more soil types. The estimate is based on weight of total sample.

Term	Percent of Total Sample
"and"	35 - 50
"some"	20 - 35
"little"	10 - 20
"trace"	less than 10

(When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.)

TABLE IV

The relative compactness or consistency is described in accord with the following terms.

Granular Soils Term	Blows per Foot, N	Cohesive Soils Term	Blows per Foot, N
Loose	< 11	Very Soft	< 3
Firm	11 - 30	Soft	3 - 5
Compact	31 - 50	Medium	6 - 15
Very Compact	> 51	Stiff	16 - 25
		Hard	> 26

(Large particles in the soils will often significantly influence the blows per foot recorded during the Penetration Test.)

TABLE V

Varved	- Horizontal uniform layers or seams of soil(s).
Layer	- Soil deposit more than 6" thick.
Seam	- Soil deposit less than 6" thick.
Parting	- Soil deposit less than ⅛" thick.
Laminated	- Irregular, horizontal and angled seams and partings of soil(s).

TABLE VI

Rock Classification Terms

Term		Meaning	
Hardness	Soft	Scratched by fingernail	
	Medium Hard	Scratched easily by penknife	
	Hard	Scratched with difficulty by penknife	
	Very Hard	Cannot be scratched by penknife	
Weathering	Very Weathered Weathered Sound	Judged from the relative amounts of disintegration iron staining, core recovery, clay seams, etc.	
Bedding	Laminated	Natural breaks in Rock Layers	(<1")
	Thin bedded		(1" - 4")
	Bedded		(4" - 12")
	Thick bedded		(12" - 36")
	Massive		(>36")

(Fracturing refers to natural breaks in the rock oriented at some angle to the rock layers.)

GENERAL INFORMATION & KEY TO SUBSURFACE LOGS

The Subsurface Logs attached to this report present the observations and mechanical data collected by the driller at the site, supplemented by classification of the material removed from the borings as determined through visual identification by technicians in the laboratory. It is cautioned that the materials removed from the borings represent only a fraction of the total volume of the deposits at the site and may not necessarily be representative of the subsurface conditions between adjacent borings or between the sampled intervals. The data presented on the Subsurface Logs together with the recovered samples will provide a basis for evaluating the character of the subsurface conditions relative to the project. The evaluation must consider all the recorded details and their significance relative to each other. Often analyses of standard boring data indicate the need for additional testing or sampling procedures to more accurately evaluate the subsurface conditions. Any evaluation of the contents of this report and the recovered samples must be performed by Professionals. The information presented in the following defines some of the procedures and terms used on the Subsurface Logs to describe the conditions encountered.

1. The figures in the Depth column defines the scale of the Subsurface Log.

2. The sample column shows, graphically, the depth range from which a sample was recovered. See Table 1 for a description of the symbols used to signify the various types of samples.

3. The Sample No. is used for identification on sample containers and/or Laboratory Test Reports.

4. Blows on Sampler — shows the results of the "Penetration Test", recording the number of blows required to drive a split spoon sampler into the soil. The number of blows required for each six inches of penetration is recorded. The first 6 inches of penetration is considered to be a seating drive. The number of blows required for the second and third 6 inches of penetration is termed the penetration resistance, N. The outside diameter of the sampler, the hammer weight and the length of drop are noted at the bottom of the Subsurface Log.

5. Blows on Casing — shows the number of blows required to advance the casing a distance of 12 inches. The casing size, the hammer weight and the length of drop are noted at the bottom of the Subsurface Log. If the casing is advanced by means other than driving, the method of advancement will be indicated in the Notes column or under the Method of Investigation at the bottom of the Subsurface Log.

6. All recovered soil samples are reviewed in the laboratory by an engineering technician, geologist or geotechnical engineer, unless note otherwise. The visual descriptions are made on the basis of a combination of the driller's field descriptions and observations and the sample as received in the laboratory. The method of visual classification is based primarily on the Unified Soil Classification (ASTM D 2487-83) with regard to the particle size and plasticity. (See Table No. II) Additionally, the relative portion, by weight, of two or more soil types is described for granular soils in accordance with "Suggested Methods of Test for Identification of Soils" by D. M. Burmister, ASTM Special Technical Publication 479, June 1970. (See Table No. III) The description of the relative soil density or consistency is based upon the penetration records as defined on Table No. IV. The description of the soil moisture is based upon the relative wetness of the soil as recovered and is described as dry, moist, wet and saturated. Water introduced in the boring either naturally or during drilling may have affected the moisture condition of the recovered sample. Special terms are used as required to describe materials in greater detail; several such terms are listed in Table V. When sampling gravelly soils with a standard two inch diameter split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter. The presence of boulders and large gravel is sometimes, but not necessarily, detected by an evaluation of the casing and samplers blows or through the "action" of the drill rig as reported by the driller.

7. The description of the rock shown is based on the recovered rock core and the driller's observations. The terms frequently used in the description are included in Table VI.

8. The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Solid stratification lines are based on the driller's field observations.

9. Miscellaneous observations and procedures noted by the driller are shown in this column, including water level observations. It is important to realize the reliability of the water level observations depends upon the soil type (water does not readily stabilize in a hole through fine grained soils), and that drill water used to advance the boring may have influenced the observations. The ground water level typically will fluctuate seasonally. One or more perched or trapped water levels may exist in the ground seasonally. All the available readings should be evaluated. If definite conclusions cannot be made, it is often prudent to examine the conditions more thoroughly through test pit excavations or water observation wells.

10. The length of core run is defined as the length of penetration of the core barrel. Core recovery is the length of core recovered divided by the core run. The RQD (Rock Quality Designation) is the total pieces of NX core exceeding 4 inches in length divided by the core run. The size core barrel used is also noted.

DATE
STARTED: 10-15-98
FINISHED: 10-15-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG

98-53180

BORING NO.: S2-1
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
CLIENT: BSC Reclamation
LOCATION: Lackawanna, NY Facility

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1						.3		Red Brown SILT, tr. sand (dry-moist, FILL)	
	▨	2						.3		Turning Gray, tr. graphite flakes	
5	▨	3						1.5			
	▨	4						2.0			Very slight petroleum like odor noted on Sample No. 4
	▨	5						2.0		tr. green sand lenses	
10	▨	6						2.0		Alternating Gray, Green, Brown layers	
	▨	7						2.0		Alternating Gray, Reddish Brown (most-wet)	
15	▨	8						2.0		Gray w Brown varving, little f. Sand	
	▨	9						1.0		Becomes Gray, tr. sand	
	▨	10						2.0		Becomes Reddish Brown, Gray varving, little f-c Sand	
20	▨	11						2.0		Contains tr. sand (wet)	
	▨	12						2.0		tr. metallic staining (moist-wet)	
25	▨	13						2.0			
	▨	14						2.0			
	▨	15						2.0		Becomes Orange 28.0 - 28.5 Becomes Metallic Black 28.5' - 29.0' (moist) (Slag in Shoe)	
30											Recycling Samples 0-10', 10 - 20', 20-30' BUD Samples 0 - 30'
35											
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Mostly Sunny; Breezy
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-15-98
FINISHED: 10-15-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG

98-53180

BORING NO.: S2-2
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
LOCATION: Lackawanna, NY Facility
CLIENT: BSC Reclamation

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER					REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
			0/6	6/12	12/18	18/24	N				
0	▨	1						1.2		Brown SILT, tr. sand, tr. orange brick (moist)	
	▨	2						0.5			
5	▨	3						1.0		Becomes Dark Brown, tr. sand lenses	
	▨	4						0.8		Becomes Gray, tr. graphite flakes	
	▨	5						2.0		Becomes Brown	
10	▨	6						1.0		Contains Gray Layer 10' - 11.5', tr. brick	
	▨	7						2.0		Alternating Brown, Gray Layers	
15	▨	8						2.0		Contains little f. Sand	
	▨	9						2.0		Becomes Metallic, tr. sand	Slight petroleum odor noted on Sample No. 10
	▨	10						0.7			
20	▨	11						1.2		Contains Reddish Brown Layers (moist-wet)	
	▨	12						1.8		Contains Reddish Brown Layers (moist, wet)	
25	▨	13						2.0		Becomes Gray	
	▨	14								(Slag in Shovel)	
										Test boring complete at 27'	Recycling Samples 0-9', 9-18', 18-27' BUD Samples 0-27'
30											
35											
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Mostly Sunny; Breezy
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-15-98
FINISHED: 10-15-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG

98-53180

BORING NO.: S2-3
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
CLIENT: BSC Reclamation
LOCATION: Lackawanna, NY Facility

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1						0.3		Red Brown SILT, tr. sand, tr. clay (moist, FILL)	
	▨	2						1.0			
5	▨	3						1.5		Contains tr. orange staining, tr. sand lenses	
	▨	4						1.2		Staining becomes heavy	
	▨	5						10		Becomes Gray, tr. sheen	Slight petroleum odor noted on Sample Nos. 5, 6, 7, & 8
10	▨	6						2.0		Becomes Metallic (moist-wet)	
	▨	7						1.7		Contains tr. green gravel, tr. graphite flakes (moist)	
15	▨	8						2.0			
	▨	9						2.0			
	▨	10						2.0		Contians tr. sheen	
20	▨	11						1.7			
	▨	12								(Slag in Shoe)	
										Test boring complete at 23'	
25											
30											Recycling Samples 0-8', 8-16', 16-23' BUD Samples 0-23'
35											
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Mostly Sunny; Breezy
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-19-98
FINISHED: 10-19-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG
98-53180

BORING NO.: S2-4
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
CLIENT: BSC Reclamation
LOCATION: Lackawanna, NY Facility

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0		1						0.3		Red Brown SILT size material, little f-m sand, tr. clay (dry-mosit)	
		2						0.9			
		3						0.7			
5											
		4						0.3		(moist-very mosit)	
		5						1.5		Becomes Blackish-Red (very most-wet)	
10		6						2.0		Color varies between Black, Red & Brown	
		7						1.8		Little some silver specs (fine sand size)	
		8						2.0		Sheen w/petro like odor	
15											
		9						1.6			
		10						1.5		Becomes predominantly Red	
20		11						1.2			Spoon went from 20 - 22' with no resistance (possible void)
		12						1.4		Becomes Black	
25											
		13						1.7		Becomes Red and Black	
		14						1.5		(Slag in Shoe)	
30										Spoon refusal (w/hammer) @ 29.5' below grade	
35											Recycling Samples 0-10', 10-20', 20-29.5' BUD Samples 0-29.5'
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Mostly Sunny; Windy
CLASSIFIED BY: J. Contino

DATE STARTED: 10-19-98 FINISHED: 10-19-98	**MAXIM** TECHNOLOGIES INC	BORING NO.: S2-5 SURF. ELEV.: ± SHEET 1 OF 1

SUBSURFACE LOG

98-53180

PROJECT: Surface Impoundment Project

LOCATION: Lackawanna, NY Facility

CLIENT: BSC Reclamation

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1						0.4		Red Brown SILT size material, some f-c sand, tr. clay (dry-moist)	
	▨	2						1.1		Some Black Sand size material	
5	▨	3						1.4		(very moist-wet)	
	▨	4						1.5		Becomes Black	
	▨	5						2.0			
10	▨	6						1.1			
	▨	7						2.0		Varies in Color (Brown/Black) tr. silver specs (fine sand size)	
15	▨	8						1.1			
	▨	9						1.1		SHEEN ~~Senn~~ w/petro like odor	
	▨	10						1.2			
20	▨	11						2.0		Predominantly Black Color	
	▨	12						1.9		Greenish hue on Sample	
	▨	13						2.0		(Heavy Silver Colored Material in Shoe)	
25										Spoon refusal (w/hammer) at 26' below grade	
30											
35											Recycling Samples 0-8.5', 8.5'- 17', 17-26' BUD Samples 0-26'
40											

DRILLER: R. Brown

DRILL RIG: CME 850

METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA

WEATHER: Mostly Cloudy; Breezy

CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-15-98
FINISHED: 10-15-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG
98-53180

BORING NO.: S3-1
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
CLIENT: BSC Reclamation
LOCATION: Lackawanna, NY Facility

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER					REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
			0/6	6/12	12/18	18/24	N				
0		1						2.0		TOPSOIL .2 Red Brown SILT, tr. sand, tr. clay (moist, FILL)	
		2						1.7		Contains tr. gray bands, tr. sand lenses	
5		3						0.7		tr. graphite flakes	
		4						2.0		Becomes Brown (moist-wet)	
		5						0.3			
10		6						1.0		Becomes Dark Gray (moist)	Slight petroleum like odor on Sample # 6
		7						2.0		Becomes Green, contains staining Becomes Gray	
15		8						2.0		Becomes Brown (moist-wet)	
		9						2.0		Contins tr. red banding, tr. f-m sand seams Contiains litle f-c Sand, tr. sheen	
		10						2.0		Becomes Gray Green, Sheen	
20		11						1.5		Some Brown Band	
		12						1.0		(Slag in Shoe) Test boring complete at 22.5'	
25											
30											
35											Recycling Samples 0-7', 7'- 14', 14-22.5' BUD Samples
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Mostly Sunny; Breezy
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-15-98
FINISHED: 10-15-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG

98-53180

BORING NO.: S3-2
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
LOCATION: Lackawanna, NY Facility
CLIENT: BSC Reclamation

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1						1.0		Gray Silt, tr. sand Becomes Brown, tr. graphite flakes (dry, moist) Contians tr. clay	
	▨	2						2.0			
5	▨	3						2.0			
	▨	4						0.3		Contains tr. sand lenses	No recovery on Sample No. 4
	▨	5						0.0			
10	▨	6						1.0			
	▨	7						1.7		Becomes Gray, tr. green bands, (moist-wet)	
15	▨	8						2.0		Becomes Brown	
	▨	9						2.0		Becomes Metallic	
	▨	10						2.0			
20										(Slag in Shoe)	
										Test boring complete at 22'	
25											
30											
35											Recycling Samples 0-7', 7'- 14', 14-22' BUD Samples 0-22'
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Mostly Sunny; Breezy
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-14-98
FINISHED: 10-14-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG

98-53180

BORING NO.: S3-3
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
LOCATION: Lackawanna, NY Facility
CLIENT: BSC Reclamation

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0		1						1.7		TOPSOIL .3 Brown SILT, little clay, tr. sand (moist, FILL)	
		2						2.0		Contains tr. gray bands	
5		3						0.0			No Recovery on Sample #3
		4						0.7			
		5						2.0		Contains tr. tan bands	
10		6						1.0		Becomes Gray, contains tr. orange bands	Very slight napthalene odor noted on Sample #7
		7						2.0			
15		8						2.0		Sheen present on Sample (moist-wet)	
		9						1.7		Becomes Metallic	Very slight napthalene odor noted on Sample #10
		10						1.6		Contains tr. sheen	
20		11						2.0		(Slag in Shoe) Test boring complete at 22'	
25											
30											
35											Recycling Samples 0-7', 7'- 14', 14-22' BUD Samples 0-22'
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Cloudy (Rain AM); Windy
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-15-98
FINISHED: 10-15-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG
98-53180

BORING NO.: S3-4
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
CLIENT: BSC Reclamation
LOCATION: Lackawanna, NY Facility

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1						0.1		TOPSOIL	No recovery on Sample Nos. 2 & 3
	▨	2						0.0			
	▨	3						0.0			
5	▨										
	▨	4						2.0		Red Brown SILT, tr. sand, tr. clay, tr. white flakes (moist, FILL)	
	▨	5						0.5		Becomes Gray Green	
10	▨	6						2.0			
	▨	7						2.0		Alternating Gray & Brown layers (moist-wet)	
	▨	8						2.0		Becomes Brown, tr. thin black bands, white flakes	
15	▨										Petroleum like Odor noted on Sample Nos. 9 & 10 Shean present on Sample Nos 9 & 10
	▨	9						2.0		Becomes Silver Metallic, little f. Sand	
	▨	10						2.0		Sheen	
20										(Slag in Shoe) Test boring complete at 20'	Recycling Samples 0-7', 7-14', 14-20' BUD Samples 0-20'
25											
30											
35											
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Mostly Sunny; Breezy
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-14-98
FINISHED: 10-14-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG
98-53180

BORING NO.: S3-5
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
CLIENT: BSC Reclamation
LOCATION: Lackawanna, NY Facility

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1						1.7		Gray "Graphite like" SILT (dry-moist, FILL) Becomes Brown SILT, tr. sand, tr. brick, tr.r orange staining	
	▨	2						1.0		Becomes Red Brown, tr. gray banding, tr. clay (moist)	
5	▨	3						0.0			No recovery on Sample #3
	▨	4						1.0			
	▨	5						2.0		Contains tr. graphite flakes (moist-wet)	
10	▨	6						2.0			
	▨	7						0.5		Becomes Black-Dark Gray, tr. orange and red brown brick	
15	▨	8						2.0		Contains tr. "oil-like" sheen	
	▨	9						0.8		Alternating between gray and brown layers (moist)	
	▨	10						2.0		Becomes Gray, tr. brown bands, drier than other samples	
20	▨	11						1.5			
	▨	12						1.4			
25	▨	13						1.6		Contains little f-c sand size Slag	Slight napthalene odor noted on Sample #13
	▨	14						0.4		(Slag in Shoe) Test boring complete at 26.5'	
30											
35											Recycling Samples 0-9', 9'- 18', 18-26.5' BUD Samples 0-26.5'
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Cloudy (Rain AM); Windy
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-13-98
FINISHED: 10-13-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG

98-53180

BORING NO.: S6-1
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
LOCATION: Lackawanna, NY Facility
CLIENT: BSC Reclamation

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1						0.7		Red Brown SILT, tr. sand (dry-moist, FILL)	
	▨	2						1.7		Becomes Brown - Black Bands	
5	▨	3						0.7		Contains tr. sand lenses (moist)	
	▨	4						2.0			
	▨	5						2.0		Orange Staining @ 8'	
10	▨	6						2.0		Tan Staining at 10' Contains tr. Carbon Flakes	
	▨	7						2.0		Dry Area (Approx 13' - 14')	
15	▨	8						2.0		Dry Area, Contains tr. gray bands (Approx 14' - 15')	
	▨	9						1.0		Approx 14' - 15' Drier Area, tr. gray bands	
	▨	10						2.0		Sample "D~~rier~~ [illegible]" than others	
20	▨	11						2.0			
	▨	12						2.0			
25	▨	13						2.0		(moist-wet)	
	▨	14						2.0			
	▨	15						2.0		(moist)	
30	▨	16						2.0		Becomes Brown	
	▨	17						2.0		(Slag in Shoe)	
35										Test boring complete at 34'	Recycling Samples 0-11', 11-22', 22-34' BUD Samples 0-34'
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Mostly Sunny; Breezy
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-13-98
FINISHED: 10-13-98

MAXIM TECHNOLOGIES INC

SUBSURFACE LOG

98-53180

BORING NO.: S6-2
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
CLIENT: BSC Reclamation
LOCATION: Lackawanna, NY Facility

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0		1						1.7		Red Brown SILT, tr. sand (moist, FILL)	
		2						2.0			
5		3						1.8		Contains tr. clay	
		4						1.6		Contains tr. sand partings	
		5						1.8			
10		6						2.0			
		7						2.0		Area of Dryness (approx 12.5' - 13.5')	
15		8						2.0		Area of Dryness (Approx 14' - 14.5') Contains little f-c Sand	
		9						2.0		Contains tr. sand, tr. gravel size slag (moist-wet)	
		10						2.0		(moist)	
20		11						2.0			
		12						2.0			
25		13						2.0		Sample "Drier" than others	
		14						2.0		Contians little f. Sand, f-c Sand layer	
		15						1.1		Contains tr. sand (moist-wet)	
30		16						0.1		(Slag in Shoe)	
										Test boring complete at 32'	
35											Recycling Samples 0-10', 10-20', 20-32' BUD Samples 0-32'
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Mostly Sunny
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-13-98
FINISHED: 10-13-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG
98-53180

BORING NO.: S6-3
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
LOCATION: Lackawanna, NY Facility
CLIENT: BSC Reclamation

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0-6	6-12	12-18	18-24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0		1						2.0		TOPSOIL 0.4' Orange Brown SILT, tr. sand, tr. sand size slag (dry-moist, FILL)	
		2						0.4			
5		3						0.2		Becomes Red Brown, contains tr. clay (moist)	
		4						0.2			
		5						2.0		Contians tr. gray and tan banding (moist-wet)	
10		6						2.0			
		7						2.0		(moist)	
15		8						2.0		Contains tr. graphite flakes (moist-wet)	
		9						2.0			
		10						2.0		Contians tr. oil-like sheen	
20		11						2.0		Becomes Brown (moist)	
		12						2.0		Drier Area - (at 23' - 24')	
25		13						2.0			
		14						2.0			
		15						2.0			
30		16						2.0			
								2.0			
								1.0		(Slag in Shoe)	
35										Test boring complete at 35'	Recycling Samples 0-12', 12-24', 24-35' BUD Samples 0-35'
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Mostly Sunny
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-14-98
FINISHED: 10-14-98

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG

98-53180

BORING NO.: S6-4
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
CLIENT: BSC Reclamation
LOCATION: Lackawanna, NY Facility

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0		1						0.2		Brown SILT, little f. Sand, tr. graphite flakes (moist, FILL)	
		2						0.5			
5		3						1.7		Contains tr. black bands Drier Area (4' - 4.5')	
		4						2.0		Contains tr. clay, tr. sand	
		5						2.0			
10		6						1.7			
		7						2.0		Wet area at 12'	
15		8						2.0		Contains tr. sand lenses	
		9						2.0			
		10						2.0			
20		11						2.0		(moist-wet)	
		12						2.0			
25		13						2.0		(moist)	
		14						2.0		Contains tr. tan staining	
		15						2.0		(moist-wet)	
30		16						2.0		(moist)	
								2.0			
								2.0			
35										(Slag in Shoe)	Recycling Samples
										Test boring compete at 36'	0-12', 12-24', 24-36' BUD Samples 0-36'
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Cloudy (Rain AM); Windy
CLASSIFIED BY: S. Bochenek

DATE
STARTED: 10-14-98
FINISHED: 10-14-98

MAXIM TECHNOLOGIES INC

SUBSURFACE LOG

98-53180

BORING NO.: S6-5
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Surface Impoundment Project
CLIENT: BSC Reclamation
LOCATION: Lackawanna, NY Facility

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	REC (ft)	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1						1.5		TOPSOIL Red Brown SILT, tr. sand, tr. gray banding,	
	▨	2						1.7		tr. sand lenses (dry-moist, FILL)	
5	▨	3						2.0		Contians tr. clay (moist)	
	▨	4						2.0		Contains tr. tan band	
	▨	5						2.0			
10	▨	6						2.0		(moist-wet)	
	▨	7						2.0		tr. white flakes (moist)	
15	▨	8						2.0		tr. graphite flakes	
	▨	9						2.0			
	▨	10						2.0			
20	▨	11						2.0		Contains tr. brick	Soil Sample very segmented No. 12
	▨	12						2.0			
25	▨	13						2.0			
	▨	14						1.7			
	▨	15						1.6			
30	▨	16						2.0			
		17						0.2		(Slag in Shoe) Test boring complete at 32.5'	
35											Recycling Samples 0-11', 11-22', 22-32.5' BUD Samples 0-32.5'
40											

DRILLER: R. Brown
DRILL RIG: CME 850
METHOD OF INVESTIGATION: 2 Inch Split Spoon / 2 1/4 Inch HSA
WEATHER: Rain AM; Cloudy
CLASSIFIED BY: S. Bochenek

ATTACHMENT 6

September 24, 1998

To: N. B. Franco

Re: **Proposed Procedure for Sampling S-2, S-3, and S-6 Impoundments at Lackawanna**

A. Preliminary Layout (by BSC Environmental Affairs)

1. Review previous drilling locations per S. D. Irons 1988 reports.
2. Measure overall dimensions of impoundments; layout the approximate location on the impoundment surface of the previous drill coring activities.
3. Locate the new drill core sampling locations and mark with stakes.

B. Split-spoon Drilling (by Contractor)

1. In each of the three impoundments, drill five 2 inch diameter split-spoon cores at the locations marked by BSC. The drilling should cease when refusal or slag/rubble is encountered at the impoundment bottom. From previous work, this is estimated to be 24-27 ft. in S-2, 20-25 ft. in S-3, and 25-35 ft. in S-6.

   Note: Problems were encountered during the 1988 drilling with mobility of the drill rig due to poor load bearing characteristics of the impoundment material. Planking and plywood were needed to support the rig in some of the impoundments. This needs to be factored into scheduling and cost estimating.

C. Sampling (by Contractor)

1. Samples to Determine Recycling Potential: For each drill location, three samples, each representing approximately one third of the total length of the drill core should be obtained. Since these samples will be analyzed for inorganic constituents, no special preservation methods are required.
2. Samples for Beneficial Use Determination (BUD) Analyses: For each drill location, a composite of the entire length of the hole should be obtained. These samples need to be preserved at 4° C and analyzed within 2 weeks of sampling.

3. To obtain the above samples, the material in each split-spoon segment should be split lengthwise down the middle. One half should be placed in the appropriate buckets for C-1 above, while the other half used for C-2 above.

4. After completion of each drill core, the material in each bucket should be mixed, by hand, and a composite sample taken for analyses by removing multiple aliquots.

D. Analyses

1. Samples for Recycling: Each of the 15 samples from each impoundment should be analyzed for the following:

    Fe^T
    Zn
    Pb
    Na_2O
    K_2O
    C
    H_2O
    O&G (Freon Extraction in Soxhlet)

2. Samples for BUD - Each of the 5 samples from impoundments S-2 and S-6 AND S-3) should be analyzed as follows:

    a. Total Constituent

    Fe^T
    Fe^{+2}
    Fe^{+3}
    C
    CaO
    MgO
    SiO_2
    Al_2O_3
    K_2O
    Na_2O
    P
    S
    Cl
    F

    Ag
    As
    Ba
    Cd
    Cr
    Cu
    Hg
    Ni
    Pb
    Sb
    Se
    Th
    Zn
    Mn

    H_2O
    O&G
    pH

    Reactive CN
    Reactive Sulfide

b. SPLP

All TC metals and organics at NYDEC water quality detection level standards.

T. H. Weidner

cc: R. B. Allen
A. M. Caram
L. E. Platz

Attachment 7

Estimation of Contents in S-2/S-3/S-6

		S-2	S-3	S-6
Surface Area	**(sq. ft.)**	26,790	182,613	28,105
	(acres)	0.62	4.2	0.65
Ave. Depth	**(feet)**	26.9	32.9	31.8
Volume	**(cu. ft.)**	720,650	6,007,970	893,740
	(cu. yd.)	26,690	222,500	33,100
Ave. Density	**(lb./cu.ft.)**	109.4	111.5	123.9
Weight	**(Tons)**	39,400	334,900	55,400

Attachment 8

Lackawanna S-2 Impoundment
Drill Core Samples, Jan., 1998

	% H_20	% o & g	% Fe	% Zn	% Pb	% Na_20	% K_20	% C^T
S - 2 - 1								
0'-10'	28.0	3.70	39.7	1.00	0.10	0.11	0.25	10.1
10'-20'	36.0	4.60	41.8	1.20	0.10	0.06	0.11	8.7
20'-30'	38.0	1.10	41.8	1.10	0.15	0.08	0.12	10.9
Average	34.0	3.13	41.1	1.10	0.12	0.08	0.16	9.9
S - 2 - 2								
0'-9'	27.0	1.50	47.1	1.20	0.11	0.06	0.06	6.8
9'-18'	37.0	3.20	42.2	1.20	0.16	0.09	0.15	8.1
18'-27'	36.0	3.70	40.0	0.97	0.13	0.11	0.26	9.1
Average	33.3	2.80	43.1	1.12	0.13	0.09	0.16	8.0
S - 2 - 3								
0'-7'	33.0	0.30	45.1	0.65	0.16	0.08	0.11	5.2
7'-14'	39.0	2.90	41.0	1.00	0.14	0.12	0.16	10.7
14'-22'	36.0	1.90	41.7	0.82	0.12	0.14	0.32	7.9
Average	36.0	1.70	42.6	0.82	0.14	0.11	0.20	7.9
S - 2 - 4								
0'-10'	30.0	3.70	44.8	1.30	0.16	0.06	0.08	9.1
10'-20'	34.0	5.50	44.0	1.30	0.12	0.06	0.10	8.2
20'-29.5'	42.0	5.00	41.4	1.10	0.10	0.09	0.23	7.8
Average	35.3	4.73	43.4	1.23	0.13	0.07	0.14	8.4
S - 2 - 5								
0'-8.5'	30.0	2.00	44.5	1.70	0.16	0.05	0.07	7.8
8.5'-17'	30.0	4.00	41.0	1.40	0.20	0.09	0.16	9.6
17'-26'	32.0	3.10	36.7	0.88	0.12	0.12	0.26	8.8
Average	30.7	3.03	40.7	1.33	0.16	0.09	0.16	8.7
Overall Average	33.9	3.08	42.2	1.12	0.14	0.09	0.16	8.6

Lackawanna S-2 Impoundment
Drill Core Samples, Jan., 1998
% H_20

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 2 - 1	28.0	36.0	38.0	34.0
S - 2 - 2	27.0	37.0	36.0	33.3
S - 2 - 3	33.0	39.0	36.0	36.0
S - 2 - 4	30.0	34.0	42.0	35.3
S - 2 - 5	30.0	30.0	32.0	30.7
Average	29.6	35.2	36.8	33.9

Lackawanna S-2 Impoundment Drill Core Samples, Jan., 1998

% o & g

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 2 - 1	3.70	4.60	1.10	3.13
S - 2 - 2	1.50	3.20	3.70	2.80
S - 2 - 3	0.30	2.90	1.90	1.70
S - 2 - 4	3.70	5.50	5.00	4.73
S - 2 - 5	2.00	4.00	3.10	3.03
Average	2.24	4.04	2.96	3.08

Lackawanna S-2 Impoundment
Drill Core Samples, Jan., 1998
% Fe

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 2 - 1	39.7	41.8	41.8	41.1
S - 2 - 2	47.1	42.2	40.0	43.1
S - 2 - 3	45.1	41.0	41.7	42.6
S - 2 - 4	44.8	44.0	41.4	43.4
S - 2 - 5	44.5	41.0	36.7	40.7
Average	44.2	42.0	40.3	42.2

Lackawanna S-2 Impoundment
Drill Core Samples, Jan., 1998
% Zn

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 2 - 1	1.00	1.20	1.10	1.10
S - 2 - 2	1.20	1.20	0.97	1.12
S - 2 - 3	0.65	1.00	0.82	0.82
S - 2 - 4	1.30	1.30	1.10	1.23
S - 2 - 5	1.70	1.40	0.88	1.33
Average	1.17	1.22	0.97	1.12

Lackawanna S-2 Impoundment Drill Core Samples, Jan., 1998

% Pb

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 2 - 1	0.10	0.10	0.15	0.12
S - 2 - 2	0.11	0.16	0.13	0.13
S - 2 - 3	0.16	0.14	0.12	0.14
S - 2 - 4	0.16	0.12	0.10	0.13
S - 2 - 5	0.16	0.20	0.12	0.16
Average	0.14	0.14	0.12	0.14

Lackawanna S-2 Impoundment Drill Core Samples, Jan., 1998

% Na_20

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 2 - 1	0.11	0.06	0.08	0.08
S - 2 - 2	0.06	0.09	0.11	0.09
S - 2 - 3	0.08	0.12	0.14	0.11
S - 2 - 4	0.06	0.06	0.09	0.07
S - 2 - 5	0.05	0.09	0.12	0.09
Average	0.07	0.08	0.11	0.09

Lackawanna S-2 Impoundment
Drill Core Samples, Jan., 1998
% K_20

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 2 - 1	0.25	0.11	0.12	0.16
S - 2 - 2	0.06	0.15	0.26	0.16
S - 2 - 3	0.11	0.16	0.32	0.20
S - 2 - 4	0.08	0.10	0.23	0.14
S - 2 - 5	0.07	0.16	0.26	0.16
Average	0.11	0.14	0.24	0.16

Lackawanna S-2 Impoundment Drill Core Samples, Jan., 1998

% C^T

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 2 - 1	10.1	8.7	10.9	9.9
S - 2 - 2	6.8	8.1	9.1	8.0
S - 2 - 3	5.2	10.7	7.9	7.9
S - 2 - 4	9.1	8.2	7.8	8.4
S - 2 - 5	7.8	9.6	8.8	8.7
Average	7.8	9.1	8.9	8.6

Attachment 9

Lackawanna S-3 Impoundment
Drill Core Samples, Dec., 1998

	% H_20	% o & g	% Fe	% Zn	% Pb	% Na_20	% K_20	% C^T
S - 3 - 1								
0'-7'	30.6	0.20	49.5	0.47	0.12	0.07	0.08	3.8
7'-14'	32.9	2.90	45.1	1.10	0.12	0.08	0.10	7.2
14'-22.5'	37.7	5.00	47.5	1.10	0.07	0.07	0.15	8.1
Average	33.7	2.70	47.4	0.89	0.10	0.07	0.11	6.4
S - 3 - 2								
0'-7'	31.8	1.40	45.0	0.98	0.14	0.08	0.10	7.8
7'-14'	31.0	3.50	41.6	0.92	0.12	0.11	0.24	9.3
14'-22'	36.9	4.50	39.8	0.86	0.11	0.12	0.34	9.5
Average	33.2	3.13	42.1	0.92	0.12	0.10	0.23	8.9
S - 3 - 3								
0'-7'	28.2	0.20	47.6	0.72	0.13	0.08	0.08	4.1
7'-14'	22.5	2.70	46.0	0.84	0.15	0.08	0.11	5.8
14'-22'	34.3	3.40	42.2	0.88	0.13	0.12	0.28	8.5
Average	28.3	2.10	45.3	0.81	0.14	0.09	0.16	6.1
S - 3 - 4								
2'-4'	33.9	0.14	44.9	2.30	0.11	0.07	0.08	4.8
0'-10'	39.7	2.00	42.0	1.00	0.17	0.07	0.10	8.6
10'-20'	36.4	2.50	42.9	0.77	0.11	0.12	0.25	10.8
Average	36.7	1.55	43.3	1.36	0.13	0.09	0.14	8.1
S - 3 - 5								
0'-9'	33.1	0.22	49.4	0.56	0.13	0.07	0.08	3.4
9'-18'	27.7	2.50	38.6	0.68	0.09	0.14	0.43	10.8
18'-22.5'	37.2	2.20	43.9	0.99	0.14	0.09	0.12	6.7
Average	32.7	1.64	44.0	0.74	0.12	0.10	0.21	7.0
Overall Average	32.9	2.22	44.4	0.94	0.12	0.09	0.17	7.3
Overall Average w/o S-3-4 2'-4'	32.9	2.37	44.4	0.85	0.12	0.09	0.18	7.5

Lackawanna S-3 Impoundment Drill Core Samples, Dec., 1998

% H_20

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 3 - 1	30.6	32.9	37.7	33.7
S - 3 - 2	31.8	31.0	36.9	33.2
S - 3 - 3	28.2	22.5	34.3	28.3
S - 3 - 4	33.9	39.7	36.4	36.7
S - 3 - 5	33.1	27.7	37.2	32.7
Average	31.5	30.8	36.5	32.9

Lackawanna S-3 Impoundment Drill Core Samples, Dec., 1998

% o & g

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 3 - 1	0.20	2.90	5.00	2.70
S - 3 - 2	1.40	3.50	4.50	3.13
S - 3 - 3	0.20	2.70	3.40	2.10
S - 3 - 4	0.14	2.00	2.50	1.55
S - 3 - 5	0.22	2.50	2.20	1.64
Average	0.43	2.72	3.52	2.22

Lackawanna S-3 Impoundment Drill Core Samples, Dec., 1998

% Fe

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 3 - 1	49.5	45.1	47.5	47.4
S - 3 - 2	45.0	41.6	39.8	42.1
S - 3 - 3	47.6	46.0	42.2	45.3
S - 3 - 4	44.9	42.0	42.9	43.3
S - 3 - 5	49.4	38.6	43.9	44.0
Average	47.3	42.7	43.3	44.4

Lackawanna S-3 Impoundment Drill Core Samples, Dec., 1998

% Zn

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 3 - 1	0.47	1.10	1.10	0.89
S - 3 - 2	0.98	0.92	0.86	0.92
S - 3 - 3	0.72	0.84	0.88	0.81
S - 3 - 4	2.30	1.00	0.77	1.36
S - 3 - 5	0.56	0.68	0.99	0.74
Average	1.01	0.91	0.92	0.94

Lackawanna S-3 Impoundment
Drill Core Samples, Dec., 1998
% Pb

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 3 - 1	0.12	0.12	0.07	0.10
S - 3 - 2	0.14	0.12	0.11	0.12
S - 3 - 3	0.13	0.15	0.13	0.14
S - 3 - 4	0.11	0.17	0.11	0.13
S - 3 - 5	0.13	0.09	0.14	0.12
Average	0.13	0.13	0.11	0.12

Lackawanna S-3 Impoundment
Drill Core Samples, Dec., 1998
% Na_20

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 3 - 1	0.07	0.08	0.07	0.07
S - 3 - 2	0.08	0.11	0.12	0.10
S - 3 - 3	0.08	0.08	0.12	0.09
S - 3 - 4	0.07	0.07	0.12	0.09
S - 3 - 5	0.07	0.14	0.09	0.10
Average	0.07	0.10	0.10	0.09

Lackawanna S-3 Impoundment Drill Core Samples, Dec., 1998

% K_20

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 3 - 1	0.08	0.10	0.15	0.11
S - 3 - 2	0.10	0.24	0.34	0.23
S - 3 - 3	0.08	0.11	0.28	0.16
S - 3 - 4	0.08	0.10	0.25	0.14
S - 3 - 5	0.08	0.43	0.12	0.21
Average	0.08	0.20	0.23	0.17

Lackawanna S-3 Impoundment Drill Core Samples, Dec., 1998

% C^T

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 3 - 1	3.8	7.2	8.1	6.4
S - 3 - 2	7.8	9.3	9.5	8.9
S - 3 - 3	4.1	5.8	8.5	6.1
S - 3 - 4	4.8	8.6	10.8	8.1
S - 3 - 5	3.4	10.8	6.7	7.0
Average	4.8	8.3	8.7	7.3

Attachment 10

Lackawanna S-6 Impoundment
Drill Core Samples, Oct., 1998

	% H_2O	% o & g	% Fe	% Zn	% Pb	% Na_2O	% K_2O	% C^T
S - 6 - 1								
0-11	29.1	0.28	49.1	0.54	0.09	0.08	0.08	2.8
11-22	33.0	0.20	51.1	0.53	0.09	0.10	0.15	2.7
22-24	31.7	0.10	50.6	0.29	0.08	0.10	0.15	2.5
Average	31.3	0.19	50.3	0.45	0.09	0.09	0.13	2.7
S - 6 - 2								
0-10	29.9	0.27	48.8	0.54	0.10	0.07	0.07	2.6
10-20	28.8	0.16	50.2	0.51	0.08	0.09	0.11	2.6
20-30	32.1	0.42	50.2	0.28	0.08	0.09	0.14	2.5
Average	30.3	0.28	49.7	0.44	0.09	0.08	0.11	2.6
S - 6 - 3								
0-12	30.5	0.40	48.9	0.70	0.10	0.09	0.09	2.9
12-24	32.9	0.20	48.9	0.49	0.09	0.12	0.19	2.7
24-35	31.5	0.10	51.5	0.32	0.08	0.12	0.19	2.4
Average	31.6	0.23	49.8	0.50	0.09	0.11	0.16	2.7
S - 6 - 4								
0-12	30.5	0.40	48.3	0.57	0.10	0.08	0.09	2.9
12-24	35.0	0.10	49.1	0.49	0.11	0.11	0.21	2.6
24-36	32.7	0.30	50.0	0.28	0.08	0.10	0.16	2.5
Average	32.7	0.27	49.1	0.45	0.10	0.10	0.15	2.7
S - 6 - 5								
0-11	33.2	0.20	50.3	0.53	0.11	0.13	0.10	2.6
12-22	31.5	0.10	49.4	0.47	0.08	0.10	0.16	2.6
24-32.5	34.7	0.20	50.3	0.27	0.08	0.10	0.17	2.6
Average	33.1	0.17	50.0	0.42	0.09	0.11	0.14	2.6
Overall Average	31.8	0.23	49.8	0.45	0.09	0.10	0.14	2.6

Lackawanna S-6 Impoundment
Drill Core Samples, Oct., 1998
% o & g

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 6 - 1	0.28	0.20	0.10	0.19
S - 6 - 2	0.27	0.16	0.42	0.28
S - 6 - 3	0.40	0.20	0.10	0.23
S - 6 - 4	0.40	0.10	0.30	0.27
S - 6 - 5	0.20	0.10	0.20	0.17
Average	0.31	0.15	0.22	0.23

Lackawanna S-6 Impoundment
Drill Core Samples, Oct., 1998
% Fe

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 6 - 1	49.1	51.1	50.6	50.3
S - 6 - 2	48.8	50.2	50.2	49.7
S - 6 - 3	48.9	48.9	51.5	49.8
S - 6 - 4	48.3	49.1	50.0	49.1
S - 6 - 5	50.3	49.4	50.3	50.0
Average	49.1	49.7	50.5	49.8

Lackawanna S-6 Impoundment Drill Core Samples, Oct., 1998

% Zn

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 6 - 1	0.54	0.53	0.29	0.45
S - 6 - 2	0.54	0.51	0.28	0.44
S - 6 - 3	0.70	0.49	0.32	0.50
S - 6 - 4	0.57	0.49	0.28	0.45
S - 6 - 5	0.53	0.47	0.27	0.42
Average	0.58	0.50	0.29	0.45

Lackawanna S-6 Impoundment
Drill Core Samples, Oct., 1998
% Pb

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 6 - 1	0.09	0.09	0.08	0.09
S - 6 - 2	0.10	0.08	0.08	0.09
S - 6 - 3	0.10	0.09	0.08	0.09
S - 6 - 4	0.10	0.11	0.08	0.10
S - 6 - 5	0.11	0.08	0.08	0.09
Average	0.10	0.09	0.08	0.09

Lackawanna S-6 Impoundment Drill Core Samples, Oct., 1998

% Na_20

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 6 - 1	0.08	0.10	0.10	0.09
S - 6 - 2	0.07	0.09	0.09	0.08
S - 6 - 3	0.09	0.12	0.12	0.11
S - 6 - 4	0.08	0.11	0.10	0.10
S - 6 - 5	0.13	0.10	0.10	0.11
Average	0.09	0.10	0.10	0.10

Lackawanna S-6 Impoundment
Drill Core Samples, Oct., 1998
% $K_2 0$

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 6 - 1	0.08	0.15	0.15	0.13
S - 6 - 2	0.07	0.11	0.14	0.11
S - 6 - 3	0.09	0.19	0.19	0.16
S - 6 - 4	0.09	0.21	0.16	0.15
S - 6 - 5	0.10	0.16	0.17	0.14
Average	0.09	0.16	0.16	0.14

Lackawanna S-6 Impoundment Drill Core Samples, Oct., 1998

% C^T

	Top 1/3	Mid 1/3	Bot 1/3	Average
S - 6 - 1	2.8	2.7	2.5	2.7
S - 6 - 2	2.6	2.6	2.5	2.6
S - 6 - 3	2.9	2.7	2.4	2.7
S - 6 - 4	2.9	2.6	2.5	2.7
S - 6 - 5	2.6	2.6	2.6	2.6
Average	2.8	2.6	2.5	2.6

ATTACHMENT 11

CHAIN-OF-CUSTODY RECORDS AND LABORATORY ANALYTICAL REPORTS FOR BENEFICIAL USE DETERMINATION

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL: GJS
QC: lm
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S2-1 1520H 10/15/98 C

ULI I.D.: 28998001
Matrix: Soil

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Carbon Dioxide	<36mg/kg dw	10/21/98		WC3648
Loss on Ignition	16%	10/20/98		WC3608
Percent Solids	67%	10/16/98		WC3593
Total Cyanide	26mg/kg dw	10/27/98		WC3651
Total Phosphorus	4.9mg/kg dw	10/29/98		WC3758
SPLP Total Cyanide	0.05mg/l	10/29/98		WC3702
Total Aluminum	5400mg/kg dw	10/21/98		MB0306
Total Antimony by furnace method	3.9mg/kg dw	10/12/98		MB0272
Total Arsenic by furnace method	16mg/kg dw	10/26/98		MB0317
Total Barium	<40mg/kg dw	10/21/98		MB0306
Total Beryllium by furnace method	0.99mg/kg dw	10/28/98		MB0328
Total Cadmium	30mg/kg dw	10/21/98		MB0306
Total Calcium	17,000mg/kg dw	10/21/98		MB0306
Total Chromium	120mg/kg dw	10/21/98		MB0306
Total Cobalt	630mg/kg dw	10/21/98		MB0306
Total Copper	87mg/kg dw	10/21/98		MB0306
Total Iron	180,000mg/kg dw	10/21/98		MB0306
Total Lead by furnace method	610mg/kg dw	10/21/98		MB0306
Total Magnesium	7700mg/kg dw	10/21/98		MB0306
Total Manganese	4000mg/kg dw	10/21/98		MB0306
Total Mercury	<0.3mg/kg dw	10/27/98		MB0325
Total Nickel	110mg/kg dw	10/21/98		MB030
Total Potassium	620mg/kg dw	10/28/98		MB0327
Total Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total Silicon	220mg/kg dw	10/28/98		MB0327
Total Silver	<8mg/kg dw	10/21/98		MB0306
Total Sodium	390mg/kg dw	10/28/98		MB0327
Total Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total Vanadium	<40mg/kg dw	10/21/98		MB0306
Total Zinc	6100mg/kg dw	10/21/98		MB0306
SPLP Aluminum	0.16mg/l	10/26/98		MB0320
SPLP Antimony by furnace method	<0.003mg/l	10/12/98		MB0272
SPLP Arsenic by furnace method	0.003mg/l	10/26/98		MB0317
SPLP Barium	<0.3mg/l	10/26/98		MB0320
SPLP Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP Calcium	38mg/l	10/26/98		MB0320
SPLP Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S2-1 1520H 10/15/98 C

ULI I.D.: 28998001 Matrix: Soil

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP Copper	<0.02mg/l	10/26/98		MB0320
SPLP Iron	1.6mg/l	10/26/98		MB0320
SPLP Lead by furnace method	0.037mg/l	10/26/98		MB0311
SPLP Magnesium	9.9mg/l	10/26/98		MB0320
SPLP Manganese	0.03mg/l	10/26/98		MB0320
SPLP Mercury	<0.0004mg/l	10/27/98		MB0325
SPLP Nickel	<0.03mg/l	10/26/98		MB0320
SPLP Potassium	2.2mg/l	10/28/98		MB0327
SPLP Selenium by furnace method	0.002mg/l	10/26/98		MB0318
SPLP Silver	<0.05mg/l	10/26/98		MB0320
SPLP Sodium	7.1mg/l	10/28/98		MB0327
SPLP Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP Zinc	0.13mg/l	10/26/98		MB0320
Total Aluminum Oxide *	1.0%	10/21/98		CALCU.
Total Calcium Oxide *	2.4%	10/21/98		CALCU.
Total Ferric Oxide *	26%	10/21/98		CALCU.
Total Magnesium Oxide *	1.3%	10/21/98		CALCU.
Total Manganese Dioxide *	0.63%	10/21/98		CALCU.
Total Phosphorus Pentoxide *	0.001%	10/29/98		CALCU.
Total Silicon Dioxide (Metals) *	0.047%	10/28/98		CALCU.
SPLP Volatile Organic Compounds by 8240				
SPLP Benzene	<0.03mg/l	10/23/98		VM2128
SPLP Carbon Tetrachloride	<0.03mg/l	10/23/98		VM2128
SPLP Chlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP Chloroform	<0.03mg/l	10/23/98		VM2128
SPLP 1,4-Dichlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP 1,2-Dichloroethane	<0.03mg/l	10/23/98		VM2128
SPLP 1,1-Dichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP Methyl Ethyl Ketone	<0.1mg/l	10/23/98		VM2128
SPLP Tetrachloroethene	<0.03mg/l	10/23/98		VM2128
SPLP Trichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP Vinyl Chloride	<0.02mg/l	10/23/98		VM2128
SPLP Semivolatile Compounds by 8270				
SPLP Cresol, Total	<0.10mg/l	11/02/98		SA1762
SPLP 2,4-Dinitrotoluene	<0.05mg/l	11/02/98		SA1762
SPLP Hexachlorobenzene	<0.05mg/l	11/02/98		SA1762

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S2-1 1520H 10/15/98 C

ULI I.D.: 28998001

Matrix: Soil

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP Hexachlorobutadiene	<0.05mg/l	11/02/98		SA1762
SPLP Hexachloroethane	<0.05mg/l	11/02/98		SA1762
SPLP Nitrobenzene	<0.05mg/l	11/02/98		SA1762
SPLP Pentachlorophenol	<0.10mg/l	11/02/98		SA1762
SPLP Pyridine	<0.05mg/l	11/02/98		SA1762
SPLP 2,4,5-Trichlorophenol	<0.05mg/l	11/02/98		SA1762
SPLP 2,4,6-Trichlorophenol	<0.05mg/l	11/02/98		SA1762

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S2-2 1410H 10/15/98 C

ULI I.D.: 28998002

Matrix: Soil

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Carbon Dioxide	36mg/kg dw	10/21/98		WC3648
Loss on Ignition	16%	10/20/98		WC3608
Percent Solids	66%	10/16/98		WC3593
Total Cyanide	60mg/kg dw	10/27/98		WC3651
Total Phosphorus	220mg/kg dw	10/28/98		WC3727
SPLP Total Cyanide	0.04mg/l	10/29/98		WC3702
Total Aluminum	4400mg/kg dw	10/21/98		MB0306
Total Antimony by furnace method	5.0mg/kg dw	10/12/98		MB0272
Total Arsenic by furnace method	19mg/kg dw	10/26/98		MB0317
Total Barium	<40mg/kg dw	10/21/98		MB0306
Total Beryllium by furnace method	0.86mg/kg dw	10/28/98		MB0328
Total Cadmium	27mg/kg dw	10/21/98		MB0306
Total Calcium	17,000mg/kg dw	10/21/98		MB0306
Total Chromium	130mg/kg dw	10/21/98		MB0306
Total Cobalt	550mg/kg dw	10/21/98		MB0306
Total Copper	120mg/kg dw	10/21/98		MB0306
Total Iron	170,000mg/kg dw	10/21/98		MB0306
Total Lead by furnace method	680mg/kg dw	10/21/98		MB0306
Total Magnesium	5800mg/kg dw	10/21/98		MB0306
Total Manganese	4300mg/kg dw	10/21/98		MB0306
Total Mercury	<0.3mg/kg dw	10/27/98		MB0325
Total Nickel	120mg/kg dw	10/21/98		MB0306
Total Potassium	750mg/kg dw	10/28/98		MB0327
Total Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total Silicon	1100mg/kg dw	10/28/98		MB0327
Total Silver	<8mg/kg dw	10/21/98		MB0306
Total Sodium	430mg/kg dw	10/28/98		MB0327
Total Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total Vanadium	<40mg/kg dw	10/21/98		MB0306
Total Zinc	5300mg/kg dw	10/21/98		MB0306
SPLP Aluminum	0.15mg/l	10/26/98		MB0320
SPLP Antimony by furnace method	0.005mg/l	10/12/98		MB0272
SPLP Arsenic by furnace method	0.002mg/l	10/26/98		MB0317
SPLP Barium	<0.3mg/l	10/26/98		MB0320
SPLP Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP Calcium	37mg/l	10/26/98		MB0320
SPLP Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S2-2 1410H 10/15/98 C

ULI I.D.: 28998002

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP	Copper	<0.02mg/l	10/26/98		MB0320
SPLP	Iron	0.16mg/l	10/26/98		MB0320
SPLP	Lead by furnace method	0.004mg/l	10/26/98		MB0311
SPLP	Magnesium	24mg/l	10/26/98		MB0320
SPLP	Manganese	0.06mg/l	10/26/98		MB0320
SPLP	Mercury	<0.0004mg/l	10/27/98		MB0325
SPLP	Nickel	<0.03mg/l	10/26/98		MB0320
SPLP	Potassium	3.8mg/l	10/28/98		MB0327
SPLP	Selenium by furnace method	0.003mg/l	10/26/98		MB0318
SPLP	Silver	<0.05mg/l	10/26/98		MB0320
SPLP	Sodium	7.6mg/l	10/28/98		MB0327
SPLP	Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP	Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP	Zinc	0.13mg/l	10/26/98		MB0320
Total	Aluminum Oxide *	0.83%	10/21/98		CALCU.
Total	Calcium Oxide *	2.4%	10/21/98		CALCU.
Total	Ferric Oxide *	24%	10/21/98		CALCU.
Total	Magnesium Oxide *	0.96%	10/21/98		CALCU.
Total	Manganese Dioxide *	0.68%	10/21/98		CALCU.
Total	Phosphorus Pentoxide *	0.05%	10/28/98		CALCU.
Total	Silicon Dioxide (Metals) *	0.24%	10/28/98		CALCU
SPLP Volatile Organic Compounds by 8240					
SPLP	Benzene	<0.03mg/l	10/23/98		VM2128
SPLP	Carbon Tetrachloride	<0.03mg/l	10/23/98		VM2128
SPLP	Chlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	Chloroform	<0.03mg/l	10/23/98		VM2128
SPLP	1,4-Dichlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	1,2-Dichloroethane	<0.03mg/l	10/23/98		VM2128
SPLP	1,1-Dichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Methyl Ethyl Ketone	<0.1mg/l	10/23/98		VM2128
SPLP	Tetrachloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Trichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Vinyl Chloride	<0.02mg/l	10/23/98		VM2128
SPLP Semivolatile Compounds by 8270					
SPLP	Cresol, Total	<0.10mg/l	11/02/98		SA1762
SPLP	2,4-Dinitrotoluene	<0.05mg/l	11/02/98		SA1762
SPLP	Hexachlorobenzene	<0.05mg/l	11/02/98		SA1762

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S2-2 1410H 10/15/98 C

ULI I.D.: 28998002

Matrix: Soil

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP Hexachlorobutadiene	<0.05mg/l	11/02/98		SA1762
SPLP Hexachloroethane	<0.05mg/l	11/02/98		SA1762
SPLP Nitrobenzene	<0.05mg/l	11/02/98		SA1762
SPLP Pentachlorophenol	<0.10mg/l	11/02/98		SA1762
SPLP Pyridine	<0.05mg/l	11/02/98		SA1762
SPLP 2,4,5-Trichlorophenol	<0.05mg/l	11/02/98		SA1762
SPLP 2,4,6-Trichlorophenol	<0.05mg/l	11/02/98		SA1762

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S2-3 1315H 10/15/98 C

ULI I.D.: 28998003 Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
	Carbon Dioxide	<36mg/kg dw	10/21/98		WC3648
	Loss on Ignition	18%	10/20/98		WC3608
	Percent Solids	67%	10/16/98		WC3593
	Total Cyanide	12mg/kg dw	10/27/98		WC3651
	Total Phosphorus	370mg/kg dw	10/28/98		WC3727
SPLP	Total Cyanide	0.03mg/l	10/29/98		WC3702
Total	Aluminum	4800mg/kg dw	10/21/98		MB0306
Total	Antimony by furnace method	5.2mg/kg dw	10/12/98		MB0272
Total	Arsenic by furnace method	22mg/kg dw	10/26/98		MB0317
Total	Barium	<40mg/kg dw	10/21/98		MB0306
Total	Beryllium by furnace method	1.2mg/kg dw	10/28/98		MB0328
Total	Cadmium	24mg/kg dw	10/21/98		MB0306
Total	Calcium	19,000mg/kg dw	10/21/98		MB0306
Total	Chromium	120mg/kg dw	10/21/98		MB0306
Total	Cobalt	490mg/kg dw	10/21/98		MB0306
Total	Copper	87mg/kg dw	10/21/98		MB0306
Total	Iron	150,000mg/kg dw	10/21/98		MB0306
Total	Lead by furnace method	890mg/kg dw	10/21/98		MB0306
Total	Magnesium	6300mg/kg dw	10/21/98		MB0306
Total	Manganese	3400mg/kg dw	10/21/98		MB0306
Total	Mercury	<0.3mg/kg dw	10/27/98		MB0325
Total	Nickel	100mg/kg dw	10/21/98		MB030
Total	Potassium	610mg/kg dw	10/28/98		MB0327
Total	Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total	Silicon	110mg/kg dw	10/28/98		MB0327
Total	Silver	<8mg/kg dw	10/21/98		MB0306
Total	Sodium	390mg/kg dw	10/28/98		MB0327
Total	Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total	Vanadium	<40mg/kg dw	10/21/98		MB0306
Total	Zinc	7500mg/kg dw	10/21/98		MB0306
SPLP	Aluminum	0.14mg/l	10/26/98		MB0320
SPLP	Antimony by furnace method	0.003mg/l	10/12/98		MB0272
SPLP	Arsenic by furnace method	0.002mg/l	10/26/98		MB0317
SPLP	Barium	<0.3mg/l	10/26/98		MB0320
SPLP	Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP	Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP	Calcium	36mg/l	10/26/98		MB0320
SPLP	Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S2-3 1315H 10/15/98 C

ULI I.D.: 28998003 Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP	Copper	<0.02mg/l	10/26/98		MB0320
SPLP	Iron	0.35mg/l	10/26/98		MB0320
SPLP	Lead by furnace method	0.011mg/l	10/26/98		MB0311
SPLP	Magnesium	29mg/l	10/26/98		MB0320
SPLP	Manganese	0.07mg/l	10/26/98		MB0320
SPLP	Mercury	<0.0004mg/l	10/27/98		MB0325
SPLP	Nickel	<0.03mg/l	10/26/98		MB0320
SPLP	Potassium	2.0mg/l	10/28/98		MB0327
SPLP	Selenium by furnace method	<0.001mg/l	10/26/98		MB0318
SPLP	Silver	<0.05mg/l	10/26/98		MB0320
SPLP	Sodium	5.2mg/l	10/28/98		MB0327
SPLP	Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP	Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP	Zinc	0.09mg/l	10/26/98		MB0320
Total	Aluminum Oxide*	0.91%	10/21/98		CALCU.
Total	Calcium Oxide*	2.7%	10/21/98		CALCU.
Total	Ferric Oxide*	21%	10/21/98		CALCU.
Total	Magnesium Oxide *	1.0%	10/21/98		CALCU.
Total	Manganese Dioxide*	0.54%	10/21/98		CALCU.
Total	Phosphorus Pentoxide*	0.08%	10/28/98		CALCU.
Total	Silicon Dioxide (Metals)*	0.024%	10/28/98		CALCU.
SPLP Volatile Organic Compounds by 8240					
SPLP	Benzene	<0.03mg/l	10/23/98		VM2128
SPLP	Carbon Tetrachloride	<0.03mg/l	10/23/98		VM2128
SPLP	Chlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	Chloroform	<0.03mg/l	10/23/98		VM2128
SPLP	1,4-Dichlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	1,2-Dichloroethane	<0.03mg/l	10/23/98		VM2128
SPLP	1,1-Dichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Methyl Ethyl Ketone	<0.1mg/l	10/23/98		VM2128
SPLP	Tetrachloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Trichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Vinyl Chloride	<0.02mg/l	10/23/98		VM2128
SPLP Semivolatile Compounds by 8270					
SPLP	Cresol, Total	<0.10mg/l	11/02/98		SA1762
SPLP	2,4-Dinitrotoluene	<0.05mg/l	11/02/98		SA1762
SPLP	Hexachlorobenzene	<0.05mg/l	11/02/98		SA1762

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S2-3 1315H 10/15/98 C

ULI I.D.: 28998003
Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	11/02/98		SA1762
SPLP	Hexachloroethane	<0.05mg/l	11/02/98		SA1762
SPLP	Nitrobenzene	<0.05mg/l	11/02/98		SA1762
SPLP	Pentachlorophenol	<0.10mg/l	11/02/98		SA1762
SPLP	Pyridine	<0.05mg/l	11/02/98		SA1762
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	11/02/98		SA1762
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	11/02/98		SA1762

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S2-4 1340H 10/19/98 C

ULI I.D.: 29398033

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
	Carbon Dioxide	<40mg/kg dw	10/21/98		WC3648
	Loss on Ignition	18%	10/22/98		WC3668
	Percent Solids	62%	10/20/98		WC3627
	Total Cyanide	23mg/kg dw	10/29/98		WC3738
	Total Phosphorus	3.5mg/kg dw	10/29/98		WC3758
SPLP	Total Cyanide	0.05mg/l	10/29/98		WC3702
Total	Aluminum	4000mg/kg dw	10/26/98		MB0320
Total	Antimony by furnace method	8.0mg/kg dw	10/12/98		MB0272
Total	Arsenic by furnace method	14mg/kg dw	11/02/98		MB0339
Total	Barium	42mg/kg dw	10/26/98		MB0320
Total	Beryllium by furnace method	1.0mg/kg dw	10/28/98		MB0328
Total	Cadmium	27mg/kg dw	10/26/98		MB0320
Total	Calcium	20,000mg/kg dw	10/26/98		MB0320
Total	Chromium	130mg/kg dw	10/26/98		MB0320
Total	Cobalt	480mg/kg dw	10/26/98		MB0320
Total	Copper	140mg/kg dw	10/26/98		MB0320
Total	Iron	170,000mg/kg dw	10/26/98		MB0320
Total	Lead by furnace method	670mg/kg dw	10/26/98		MB0320
Total	Magnesium	6100mg/kg dw	10/26/98		MB0320
Total	Manganese	4300mg/kg dw	10/26/98		MB0326
Total	Mercury	<0.3mg/kg dw	11/01/98		MB0338
Total	Nickel	120mg/kg dw	10/26/98		MB0326
Total	Potassium	510mg/kg dw	10/28/98		MB0327
Total	Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total	Silicon	4800mg/kg dw	10/28/98		MB0327
Total	Silver	38mg/kg dw	10/26/98		MB0320
Total	Sodium	460mg/kg dw	10/28/98		MB0327
Total	Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total	Vanadium	<48mg/kg dw	10/26/98		MB0320
Total	Zinc	6200mg/kg dw	10/26/98		MB0320
SPLP	Aluminum	0.08mg/l	10/28/98		MB0329
SPLP	Antimony by furnace method	<0.003mg/l	11/03/98		MB0348
SPLP	Arsenic by furnace method	0.002mg/l	11/02/98		MB0339
SPLP	Barium	<0.3mg/l	10/28/98		MB0329
SPLP	Beryllium by furnace method	<0.001mg/l	11/03/98		MB0344
SPLP	Cadmium	<0.005mg/l	10/28/98		MB0329
SPLP	Calcium	44mg/l	10/28/98		MB0329
SPLP	Chromium	<0.05mg/l	10/28/98		MB0329

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S2-4 1340H 10/19/98 C

ULI I.D.: 29398033
Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Cobalt	<0.05mg/l	10/28/98		MB0329
SPLP	Copper	<0.02mg/l	10/28/98		MB0329
SPLP	Iron	0.11mg/l	10/28/98		MB0329
SPLP	Lead by furnace method	<0.001mg/l	11/03/98		MB0342
SPLP	Magnesium	11mg/l	10/28/98		MB0329
SPLP	Manganese	<0.02mg/l	10/28/98		MB0329
SPLP	Mercury	<0.0004mg/l	11/01/98		MB0338
SPLP	Nickel	<0.03mg/l	10/28/98		MB0329
SPLP	Potassium	4.7mg/l	10/30/98		MB0337
SPLP	Selenium by furnace method	0.003mg/l	11/02/98		MB0340
SPLP	Silver	<0.05mg/l	10/28/98		MB0329
SPLP	Sodium	3.9mg/l	10/30/98		MB0337
SPLP	Thallium by furnace method	<0.003mg/l	11/03/98		MB0347
SPLP	Vanadium	<0.3mg/l	10/28/98		MB0329
SPLP	Zinc	0.54mg/l	10/28/98		MB0329
Total	Aluminum Oxide *	0.76%	10/26/98		CALCU.
Total	Calcium Oxide *	2.8%	10/26/98		CALCU.
Total	Ferric Oxide *	24%	10/26/98		CALCU.
Total	Magnesium Oxide *	1.0%	10/26/98		CALCU.
Total	Manganese Dioxide *	0.68%	10/26/98		CALCU.
Total	Phosphorus Pentoxide *	0.001%	10/29/98		CALCU
Total	Silicon Dioxide (Metals) *	1.0%	10/28/98		CALCU
SPLP Volatile Organic Compounds by 8240					
SPLP	Benzene	<0.03mg/l	10/23/98		VM2128
SPLP	Carbon Tetrachloride	<0.03mg/l	10/23/98		VM2128
SPLP	Chlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	Chloroform	<0.03mg/l	10/23/98		VM2128
SPLP	1,4-Dichlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	1,2-Dichloroethane	<0.03mg/l	10/23/98		VM2128
SPLP	1,1-Dichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Methyl Ethyl Ketone	<0.1mg/l	10/23/98		VM2128
SPLP	Tetrachloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Trichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Vinyl Chloride	<0.02mg/l	10/23/98		VM2128
SPLP Semivolatile Compounds by 8270					
SPLP	Cresol, Total	<0.1mg/l	11/03/98		SA1765
SPLP	2,4-Dinitrotoluene	<0.05mg/l	11/03/98		SA1765
SPLP	Hexachlorobenzene	<0.05mg/l	11/03/98		SA1765

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

state Laboratories, Inc.
lysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S2-4 1340H 10/19/98 C

ULI I.D.: 29398033

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	11/03/98		SA1765
SPLP	Hexachloroethane	<0.05mg/l	11/03/98		SA1765
SPLP	Nitrobenzene	<0.05mg/l	11/03/98		SA1765
SPLP	Pentachlorophenol	<0.1mg/l	11/03/98		SA1765
SPLP	Pyridine	<0.05mg/l	11/03/98		SA1765
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	11/03/98		SA1765
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	11/03/98		SA1765

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S2-5 1455H 10/19/98 C

ULI I.D.: 29398034

Matrix: Soil

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Carbon Dioxide	<37mg/kg dw	10/21/98		WC3648
Loss on Ignition	19%	10/22/98		WC3668
Percent Solids	66%	10/20/98		WC3627
Total Cyanide	22mg/kg dw	10/29/98		WC3738
Total Phosphorus	6.5mg/kg dw	10/29/98		WC3758
SPLP Total Cyanide	0.07mg/l	10/29/98		WC3702
Total Aluminum	3900mg/kg dw	10/26/98		MB0320
Total Antimony by furnace method	8.2mg/kg dw	10/12/98		MB0272
Total Arsenic by furnace method	22mg/kg dw	11/02/98		MB0339
Total Barium	41mg/kg dw	10/26/98		MB0320
Total Beryllium by furnace method	1.0mg/kg dw	10/28/98		MB0328
Total Cadmium	28mg/kg dw	10/26/98		MB0320
Total Calcium	21,000mg/kg dw	10/26/98		MB0320
Total Chromium	130mg/kg dw	10/26/98		MB0320
Total Cobalt	390mg/kg dw	10/26/98		MB0326
Total Copper	130mg/kg dw	10/26/98		MB0326
Total Iron	150,000mg/kg dw	10/26/98		MB0326
Total Lead by furnace method	1100mg/kg dw	10/26/98		MB0320
Total Magnesium	7900mg/kg dw	10/26/98		MB0326
Total Manganese	4500mg/kg dw	10/26/98		MB0326
Total Mercury	<0.3mg/kg dw	11/01/98		MB033
Total Nickel	110mg/kg dw	10/26/98		MB032
Total Potassium	380mg/kg dw	10/28/98		MB0327
Total Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total Silicon	6300mg/kg dw	10/28/98		MB0327
Total Silver	21mg/kg dw	10/26/98		MB0326
Total Sodium	490mg/kg dw	10/28/98		MB0327
Total Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total Vanadium	<48mg/kg dw	10/26/98		MB0326
Total Zinc	9400mg/kg dw	10/26/98		MB0320
SPLP Aluminum	0.09mg/l	10/28/98		MB0329
SPLP Antimony by furnace method	<0.003mg/l	11/03/98		MB0348
SPLP Arsenic by furnace method	0.001mg/l	11/02/98		MB0339
SPLP Barium	<0.3mg/l	10/28/98		MB0329
SPLP Beryllium by furnace method	<0.001mg/l	11/03/98		MB0344
SPLP Cadmium	<0.005mg/l	10/28/98		MB0329
SPLP Calcium	39mg/l	10/28/98		MB0329
SPLP Chromium	<0.05mg/l	10/28/98		MB0329

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S2-5 1455H 10/19/98 C

ULI I.D.: 29398034 Matrix: Soil

PARAMETERS		RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Cobalt	<0.05mg/l	10/28/98		MB0329
SPLP	Copper	<0.02mg/l	10/28/98		MB0329
SPLP	Iron	0.05mg/l	10/28/98		MB0329
SPLP	Lead by furnace method	<0.001mg/l	11/03/98		MB0342
SPLP	Magnesium	22mg/l	10/28/98		MB0329
SPLP	Manganese	0.03mg/l	10/28/98		MB0329
SPLP	Mercury	<0.0004mg/l	11/01/98		MB0338
SPLP	Nickel	0.03mg/l	10/28/98		MB0329
SPLP	Potassium	2.7mg/l	10/30/98		MB0337
SPLP	Selenium by furnace method	0.003mg/l	11/02/98		MB0340
SPLP	Silver	<0.05mg/l	10/28/98		MB0329
SPLP	Sodium	3.6mg/l	10/30/98		MB0337
SPLP	Thallium by furnace method	<0.003mg/l	11/03/98		MB0347
SPLP	Vanadium	<0.3mg/l	10/28/98		MB0329
SPLP	Zinc	0.46mg/l	10/28/98		MB0329
Total	Aluminum Oxide *	0.74%	10/26/98		CALCU.
Total	Calcium Oxide *	2.9%	10/26/98		CALCU.
Total	Ferric Oxide *	21%	10/26/98		CALCU.
Total	Magnesium Oxide *	1.2%	10/26/98		CALCU.
Total	Manganese Dioxide *	0.71%	10/26/98		CALCU.
Total	Phosphorus Pentoxide *	0.001%	10/29/98		CALCU.
Total	Silicon Dioxide (Metals)*	1.3%	10/28/98		CALCU.

SPLP Volatile Organic Compounds by 8240

SPLP	Benzene	<0.03mg/l	10/23/98		VM2128
SPLP	Carbon Tetrachloride	<0.03mg/l	10/23/98		VM2128
SPLP	Chlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	Chloroform	<0.03mg/l	10/23/98		VM2128
SPLP	1,4-Dichlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	1,2-Dichloroethane	<0.03mg/l	10/23/98		VM2128
SPLP	1,1-Dichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Methyl Ethyl Ketone	<0.1mg/l	10/23/98		VM2128
SPLP	Tetrachloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Trichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Vinyl Chloride	<0.02mg/l	10/23/98		VM2128

SPLP Semivolatile Compounds by 8270

SPLP	Cresol, Total	<0.1mg/l	11/03/98		SA1765
SPLP	2,4-Dinitrotoluene	<0.05mg/l	11/03/98		SA1765
SPLP	Hexachlorobenzene	<0.05mg/l	11/03/98		SA1765

dw = Dry weight

* Calculation based upon total ion concentraiton.

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC: WA
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S2-5 1455H 10/19/98 C

ULI I.D.: 29398034

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	11/03/98		SA1765
SPLP	Hexachloroethane	<0.05mg/l	11/03/98		SA1765
SPLP	Nitrobenzene	<0.05mg/l	11/03/98		SA1765
SPLP	Pentachlorophenol	<0.1mg/l	11/03/98		SA1765
SPLP	Pyridine	<0.05mg/l	11/03/98		SA1765
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	11/03/98		SA1765
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	11/03/98		SA1765

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S3-1 0925H 10/15/98 C

ULI I.D.: 28998006
Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
	Carbon Dioxide	<37mg/kg dw	10/21/98		WC3648
	Loss on Ignition	13%	10/30/98		WC3772
	Percent Solids	64%	10/16/98		WC3593
	Total Cyanide	21mg/kg dw	10/27/98		WC3651
	Total Phosphorus	170mg/kg dw	10/28/98		WC3727
SPLP	Total Cyanide	0.07mg/l	10/29/98		WC3702
Total	Aluminum	7500mg/kg dw	10/21/98		MB0306
Total	Antimony by furnace method	2.8mg/kg dw	10/12/98		MB0272
Total	Arsenic by furnace method	17mg/kg dw	10/26/98		MB0317
Total	Barium	<40mg/kg dw	10/21/98		MB0306
Total	Beryllium by furnace method	0.88mg/kg dw	10/28/98		MB0328
Total	Cadmium	28mg/kg dw	10/21/98		MB0306
Total	Calcium	19,000mg/kg dw	10/21/98		MB0306
Total	Chromium	100mg/kg dw	10/21/98		MB0306
Total	Cobalt	540mg/kg dw	10/21/98		MB0306
Total	Copper	78mg/kg dw	10/21/98		MB0306
Total	Iron	170,000mg/kg dw	10/21/98		MB0306
Total	Lead by furnace method	470mg/kg dw	10/21/98		MB0306
Total	Magnesium	6900mg/kg dw	10/21/98		MB0306
Total	Manganese	2800mg/kg dw	10/21/98		MB0306
Total	Mercury	<0.3mg/kg dw	10/27/98		MB0325
Total	Nickel	100mg/kg dw	10/21/98		MB0306
Total	Potassium	460mg/kg dw	10/28/98		MB0327
Total	Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total	Silicon	2700mg/kg dw	10/28/98		MB0327
Total	Silver	<8mg/kg dw	10/21/98		MB0306
Total	Sodium	330mg/kg dw	10/28/98		MB0327
Total	Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total	Vanadium	<40mg/kg dw	10/21/98		MB0306
Total	Zinc	11,000mg/kg dw	10/21/98		MB0306
SPLP	Aluminum	0.67mg/l	10/26/98		MB0320
SPLP	Antimony by furnace method	0.003mg/l	10/12/98		MB0272
SPLP	Arsenic by furnace method	0.006mg/l	10/26/98		MB0317
SPLP	Barium	<0.3mg/l	10/26/98		MB0320
SPLP	Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP	Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP	Calcium	52mg/l	10/26/98		MB0320
SPLP	Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S3-1 0925H 10/15/98 C

ULI I.D.: 28998006 Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP	Copper	<0.02mg/l	10/26/98		MB0320
SPLP	Iron	0.51mg/l	10/26/98		MB0320
SPLP	Lead by furnace method	0.005mg/l	10/26/98		MB0311
SPLP	Magnesium	<0.5mg/l	10/26/98		MB0320
SPLP	Manganese	<0.02mg/l	10/26/98		MB0320
SPLP	Mercury	0.0010mg/l	10/27/98		MB0325
SPLP	Nickel	0.03mg/l	10/26/98		MB0320
SPLP	Potassium	5.7mg/l	10/28/98		MB0327
SPLP	Selenium by furnace method	0.004mg/l	10/26/98		MB0318
SPLP	Silver	0.06mg/l	10/26/98		MB0320
SPLP	Sodium	5.6mg/l	10/28/98		MB0327
SPLP	Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP	Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP	Zinc	0.07mg/l	10/26/98		MB0320
Total	Aluminum Oxide*	1.4%	10/21/98		CALCU.
Total	Calcium Oxide *	2.7%	10/21/98		CALCU.
Total	Ferric Oxide *	24%	10/21/98		CALCU.
Total	Magnesium Oxide*	1.1%	10/21/98		CALCU.
Total	Manganese Dioxide*	0.44%	10/21/98		CALCU.
Total	Phosphorus Pentoxide*	0.04%	10/28/98		CALCU
Total	Silicon Dioxide (Metals)*	0.58%	10/28/98		CALCU
SPLP Volatile Organic Compounds by 8240					
SPLP	Benzene	<0.03mg/l	10/23/98		VM2128
SPLP	Carbon Tetrachloride	<0.03mg/l	10/23/98		VM2128
SPLP	Chlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	Chloroform	<0.03mg/l	10/23/98		VM2128
SPLP	1,4-Dichlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	1,2-Dichloroethane	<0.03mg/l	10/23/98		VM2128
SPLP	1,1-Dichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Methyl Ethyl Ketone	<0.1mg/l	10/23/98		VM2128
SPLP	Tetrachloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Trichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Vinyl Chloride	<0.02mg/l	10/23/98		VM2128
SPLP Semivolatile Compounds by 8270					
SPLP	Cresol, Total	<0.10mg/l	11/02/98		SA1762
SPLP	2,4-Dinitrotoluene	<0.05mg/l	11/02/98		SA1762
SPLP	Hexachlorobenzene	<0.05mg/l	11/02/98		SA1762

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S3-1 0925H 10/15/98 C

ULI I.D.: 28998006

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	11/02/98		SA1762
SPLP	Hexachloroethane	<0.05mg/l	11/02/98		SA1762
SPLP	Nitrobenzene	<0.05mg/l	11/02/98		SA1762
SPLP	Pentachlorophenol	<0.10mg/l	11/02/98		SA1762
SPLP	Pyridine	<0.05mg/l	11/02/98		SA1762
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	11/02/98		SA1762
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	11/02/98		SA1762

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL: GJS
QC: WD
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S3-2 1020H 10/15/98 C

ULI I.D.: 28998005
Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
	Carbon Dioxide	<39mg/kg dw	10/21/98		WC3648
	Loss on Ignition	14%	10/20/98		WC3608
	Percent Solids	63%	10/16/98		WC3593
	Total Cyanide	19mg/kg dw	10/27/98		WC3651
	Total Phosphorus	6.3mg/kg dw	10/29/98		WC3758
SPLP	Total Cyanide	0.04mg/l	10/29/98		WC3702
Total	Aluminum	3000mg/kg dw	10/21/98		MB0306
Total	Antimony by furnace method	4.9mg/kg dw	10/12/98		MB0272
Total	Arsenic by furnace method	18mg/kg dw	10/26/98		MB0317
Total	Barium	<40mg/kg dw	10/21/98		MB0306
Total	Beryllium by furnace method	0.84mg/kg dw	10/28/98		MB0328
Total	Cadmium	28mg/kg dw	10/21/98		MB0306
Total	Calcium	20,000mg/kg dw	10/21/98		MB0306
Total	Chromium	120mg/kg dw	10/21/98		MB0306
Total	Cobalt	570mg/kg dw	10/21/98		MB0306
Total	Copper	110mg/kg dw	10/21/98		MB0306
Total	Iron	180,000mg/kg dw	10/21/98		MB0306
Total	Lead by furnace method	880mg/kg dw	10/21/98		MB0306
Total	Magnesium	9900mg/kg dw	10/21/98		MB0306
Total	Manganese	4800mg/kg dw	10/21/98		MB0306
Total	Mercury	<0.3mg/kg dw	10/27/98		MB0325
Total	Nickel	110mg/kg dw	10/21/98		MB030
Total	Potassium	590mg/kg dw	10/28/98		MB0327
Total	Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total	Silicon	4700mg/kg dw	10/28/98		MB0327
Total	Silver	<8mg/kg dw	10/21/98		MB0306
Total	Sodium	550mg/kg dw	10/28/98		MB0327
Total	Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total	Vanadium	<40mg/kg dw	10/21/98		MB0306
Total	Zinc	5800mg/kg dw	10/21/98		MB0306
SPLP	Aluminum	0.13mg/l	10/26/98		MB0320
SPLP	Antimony by furnace method	0.005mg/l	10/12/98		MB0272
SPLP	Arsenic by furnace method	0.004mg/l	10/26/98		MB0317
SPLP	Barium	<0.3mg/l	10/26/98		MB0320
SPLP	Beryllium by furnace method	90.001mg/l	10/28/98		MB0328
SPLP	Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP	Calcium	38mg/l	10/26/98		MB0320
SPLP	Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S3-2 1020H 10/15/98 C

ULI I.D.: 28998005

Matrix: Soil

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP Copper	<0.02mg/l	10/26/98		MB0320
SPLP Iron	0.31mg/l	10/26/98		MB0320
SPLP Lead by furnace method	3.015mg/l	10/26/98		MB0311
SPLP Magnesium	3.3mg/l	10/26/98		MB0320
SPLP Manganese	<0.02mg/l	10/26/98		MB0320
SPLP Mercury	<0.0004mg/l	10/27/98		MB0325
SPLP Nickel	0.03mg/l	10/26/98		MB0320
SPLP Potassium	8.2mg/l	10/28/98		MB0327
SPLP Selenium by furnace method	0.005mg/l	10/26/98		MB0318
SPLP Silver	<0.05mg/l	10/26/98		MB0320
SPLP Sodium	7.1mg/l	10/28/98		MB0327
SPLP Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP Zinc	0.06mg/l	10/26/98		MB0320
Total Aluminum Oxide *	0.57%	10/21/98		CALCU.
Total Calcium Oxide *	2.8%	10/21/98		CALCU.
Total Ferric Oxide *	26%	10/21/98		CALCU.
Total Magnesium Oxide *	1.6%	10/21/98		CALCU.
Total Manganese Dioxide *	0.76%	10/21/98		CALCU.
Total Phosphorus Pentoxide *	0.001%	10/29/98		CALCU.
Total Silicon Dioxide (Metals) *	1.0%	10/28/98		CALCU.

SPLP Volatile Organic Compounds by 8240

SPLP Benzene	<0.03mg/l	10/23/98	VM2128
SPLP Carbon Tetrachloride	<0.03mg/l	10/23/98	VM2128
SPLP Chlorobenzene	<0.03mg/l	10/23/98	VM2128
SPLP Chloroform	<0.03mg/l	10/23/98	VM2128
SPLP 1,4-Dichlorobenzene	<0.03mg/l	10/23/98	VM2128
SPLP 1,2-Dichloroethane	<0.03mg/l	10/23/98	VM2128
SPLP 1,1-Dichloroethene	<0.03mg/l	10/23/98	VM2128
SPLP Methyl Ethyl Ketone	<0.1mg/l	10/23/98	VM2128
SPLP Tetrachloroethene	<0.03mg/l	10/23/98	VM2128
SPLP Trichloroethene	<0.03mg/l	10/23/98	VM2128
SPLP Vinyl Chloride	<0.02mg/l	10/23/98	VM2128

SPLP Semivolatile Compounds by 8270

SPLP Cresol, Total	<0.10mg/l	11/02/98	SA1762
SPLP 2,4-Dinitrotoluene	<0.05mg/l	11/02/98	SA1762
SPLP Hexachlorobenzene	<0.05mg/l	11/02/98	SA1762

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S3-2 1020H 10/15/98 C

ULI I.D.: 28998005
Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	11/02/98		SA1762
SPLP	Hexachloroethane	<0.05mg/l	11/02/98		SA1762
SPLP	Nitrobenzene	<0.05mg/l	11/02/98		SA1762
SPLP	Pentachlorophenol	<0.10mg/l	11/02/98		SA1762
SPLP	Pyridine	<0.05mg/l	11/02/98		SA1762
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	11/02/98		SA1762
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	11/02/98		SA1762

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL: JLS
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S3-3 1445H 10/14/98 C

ULI I.D.: 28898022
Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
	Carbon Dioxide	<39mg/kg dw	10/21/98		WC3648
	Loss on Ignition	13%	10/20/98		WC3608
	Percent Solids	63%	10/15/98		WC3575
	Total Cyanide	25mg/kg dw	10/22/98		WC3651
	Total Phosphorus	420mg/kg dw	10/27/98		WC3718
SPLP	Total Cyanide	0.04mg/l	10/27/98		WC3637
Total	Aluminum	2800mg/kg dw	10/21/98		MB0306
Total	Antimony by furnace method	4.4mg/kg dw	10/12/98		MB0272
Total	Arsenic by furnace method	15mg/kg dw	10/26/98		MB0317
Total	Barium	<40mg/kg dw	10/21/98		MB0306
Total	Beryllium by furnace method	0.92mg/kg dw	10/28/98		MB0328
Total	Cadmium	28mg/kg dw	10/21/98		MB0306
Total	Calcium	19,000mg/kg dw	10/21/98		MB0306
Total	Chromium	140mg/kg dw	10/21/98		MB0306
Total	Cobalt	590mg/kg dw	10/21/98		MB0306
Total	Copper	110mg/kg dw	10/21/98		MB0306
Total	Iron	180,000mg/kg dw	10/21/98		MB0306
Total	Lead by furnace method	1000mg/kg dw	10/21/98		MB0306
Total	Magnesium	11,000mg/kg dw	10/21/98		MB0306
Total	Manganese	5200mg/kg dw	10/21/98		MB0306
Total	Mercury	<0.3mg/kg dw	10/27/98		MB0325
Total	Nickel	130mg/kg dw	10/21/98		MB0306
Total	Potassium	430mg/kg dw	10/28/98		MB0327
Total	Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total	Silicon	5300mg/kg dw	10/28/98		MB0327
Total	Silver	13mg/kg dw	10/21/98		MB0306
Total	Sodium	500mg/kg dw	10/28/98		MB0327
Total	Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total	Vanadium	<40mg/kg dw	10/21/98		MB0306
Total	Zinc	5100mg/kg dw	10/21/98		MB0306
SPLP	Aluminum	0.23mg/l	10/26/98		MB0320
SPLP	Antimony by furnace method	0.009mg/l	10/12/98		MB0272
SPLP	Arsenic by furnace method	0.006mg/l	10/26/98		MB0317
SPLP	Barium	<0.3mg/l	10/26/98		MB0320
SPLP	Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP	Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP	Calcium	56mg/l	10/26/98		MB0320
SPLP	Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S3-3 1445H 10/14/98 C

ULI I.D.: 28898022 Matrix: Soil

PARAMETERS		RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP	Copper	<0.02mg/l	10/26/98		MB0320
SPLP	Iron	0.10mg/l	10/26/98		MB0320
SPLP	Lead by furnace method	0.002mg/l	10/26/98		MB0311
SPLP	Magnesium	0.6mg/l	10/26/98		MB0320
SPLP	Manganese	<0.02mg/l	10/26/98		MB0320
SPLP	Mercury	0.0006mg/l	10/27/98		MB0325
SPLP	Nickel	<0.03mg/l	10/26/98		MB0320
SPLP	Potassium	7.2mg/l	10/28/98		MB0327
SPLP	Selenium by furnace method	0.008mg/l	10/26/98		MB0318
SPLP	Silver	<0.05mg/l	10/26/98		MB0320
SPLP	Sodium	6.3mg/l	10/28/98		MB0327
SPLP	Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP	Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP	Zinc	0.02mg/l	10/26/98		MB0320
Total	Aluminum Oxide *	0.53%	10/21/98		CALCU.
Total	Calcium Oxide *	2.7%	10/21/98		CALCU.
Total	Ferric Oxide *	26%	10/21/98		CALCU.
Total	Magnesium Oxide *	1.8%	10/21/98		CALCU.
Total	Manganese Dioxide *	0.82%	10/21/98		CALCU.
Total	Phosphorus Pentoxide *	0.10%	10/27/98		CALCU.
Total	Silicon Dioxide (Metals) *	1.1%	10/28/98		CALCU.
SPLP Volatile Organic Compounds by 8240					
SPLP	Benzene	<0.03mg/l	10/28/98		VM2136
SPLP	Carbon Tetrachloride	<0.03mg/l	10/28/98		VM2136
SPLP	Chlorobenzene	0.07mg/l	10/28/98		VM2136
SPLP	Chloroform	0.08mg/l	10/28/98		VM2136
SPLP	1,4-Dichlorobenzene	<0.03mg/l	10/28/98		VM2136
SPLP	1,2-Dichloroethane	<0.03mg/l	10/28/98		VM2136
SPLP	1,1-Dichloroethene	<0.03mg/l	10/28/98		VM2136
SPLP	Methyl Ethyl Ketone	<0.1mg/l	10/28/98		VM2136
SPLP	Tetrachloroethene	<0.03mg/l	10/28/98		VM2136
SPLP	Trichloroethene	<0.03mg/l	10/28/98		VM2136
SPLP	Vinyl Chloride	<0.02mg/l	10/28/98		VM2136
SPLP Semivolatile Compounds by 8270					
SPLP	Cresol, Total	<0.10mg/l	10/28/98		SA1760
SPLP	2,4-Dinitrotoluene	<0.05mg/l	10/28/98		SA1760
SPLP	Hexachlorobenzene	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

tate Laboratories, Inc.
lysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S3-3 1445H 10/14/98 C

ULI I.D.: 28898022

Matrix: Soil

PARAMETERS		RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	10/28/98		SA1760
SPLP	Hexachloroethane	<0.05mg/l	10/28/98		SA1760
SPLP	Nitrobenzene	<0.05mg/l	10/28/98		SA1760
SPLP	Pentachlorophenol	<0.10mg/l	10/28/98		SA1760
SPLP	Pyridine	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S3-4 1110H 10/15/98 C

ULI I.D.: 28998004
Matrix: Soil

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Carbon Dioxide	37mg/kg dw	10/21/98		WC3648
Loss on Ignition	16%	10/20/98		WC3608
Percent Solids	63%	10/16/98		WC3593
Total Cyanide	16mg/kg dw	10/27/98		WC3651
Total Phosphorus	67mg/kg dw	10/28/98		WC3727
SPLP Total Cyanide	0.06mg/l	10/29/98		WC3702
Total Aluminum	3100mg/kg dw	10/21/98		MB0306
Total Antimony by furnace method	5.1mg/kg dw	10/12/98		MB0272
Total Arsenic by furnace method	25mg/kg dw	10/26/98		MB0317
Total Barium	<40mg/kg dw	10/21/98		MB0306
Total Beryllium by furnace method	1.0mg/kg dw	10/28/98		MB0328
Total Cadmium	32mg/kg dw	10/21/98		MB0306
Total Calcium	18,000mg/kg dw	10/21/98		MB0306
Total Chromium	120mg/kg dw	10/21/98		MB0306
Total Cobalt	620mg/kg dw	10/21/98		MB0306
Total Copper	130mg/kg dw	10/21/98		MB0306
Total Iron	190,000mg/kg dw	10/21/98		MB0306
Total Lead by furnace method	800mg/kg dw	10/21/98		MB0306
Total Magnesium	9000mg/kg dw	10/21/98		MB0306
Total Manganese	4600mg/kg dw	10/21/98		MB0306
Total Mercury	0.39mg/kg dw	10/27/98		MB0325
Total Nickel	120mg/kg dw	10/21/98		MB0306
Total Potassium	760mg/kg dw	10/28/98		MB0327
Total Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total Silicon	770mg/kg dw	10/28/98		MB0327
Total Silver	<8mg/kg dw	10/21/98		MB0306
Total Sodium	660mg/kg dw	10/28/98		MB0327
Total Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total Vanadium	<40mg/kg dw	10/21/98		MB0306
Total Zinc	6500mg/kg dw	10/21/98		MB0306
SPLP Aluminum	0.16mg/l	10/26/98		MB0320
SPLP Antimony by furnace method	0.006mg/l	10/12/98		MB0272
SPLP Arsenic by furnace method	0.003mg/l	10/26/98		MB0317
SPLP Barium	<0.3mg/l	10/26/98		MB0320
SPLP Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP Calcium	37mg/l	10/26/98		MB0320
SPLP Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

ate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S3-4 1110H 10/15/98 C

ULI I.D.: 28998004

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	11/02/98		SA1762
SPLP	Hexachloroethane	<0.05mg/l	11/02/98		SA1762
SPLP	Nitrobenzene	<0.05mg/l	11/02/98		SA1762
SPLP	Pentachlorophenol	<0.10mg/l	11/02/98		SA1762
SPLP	Pyridine	<0.05mg/l	11/02/98		SA1762
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	11/02/98		SA1762
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	11/02/98		SA1762

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S3-5 1345H 10/14/98 C

ULI I.D.: 28898023

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
	Carbon Dioxide	<34mg/kg dw	10/21/98		WC3648
	Loss on Ignition	17%	10/20/98		WC3608
	Percent Solids	69%	10/15/98		WC3575
	Total Cyanide	20mg/kg dw	10/22/98		WC3651
	Total Phosphorus	340mg/kg dw	10/27/98		WC3718
SPLP	Total Cyanide	0.03mg/l	10/27/98		WC3637
Total	Aluminum	4100mg/kg dw	10/21/98		MB0306
Total	Antimony by furnace method	4.6mg/kg dw	10/12/98		MB0272
Total	Arsenic by furnace method	14mg/kg dw	10/26/98		MB0317
Total	Barium	46mg/kg dw	10/21/98		MB0306
Total	Beryllium by furnace method	1.2mg/kg dw	10/28/98		MB0328
Total	Cadmium	28mg/kg dw	10/21/98		MB0306
Total	Calcium	17,000mg/kg dw	10/21/98		MB0306
Total	Chromium	140mg/kg dw	10/21/98		MB0306
Total	Cobalt	570mg/kg dw	10/21/98		MB0306
Total	Copper	140mg/kg dw	10/21/98		MB0306
Total	Iron	170,000mg/kg dw	10/21/98		MB0306
Total	Lead by furnace method	880mg/kg dw	10/21/98		MB0306
Total	Magnesium	8200mg/kg dw	10/21/98		MB0306
Total	Manganese	5000mg/kg dw	10/21/98		MB0306
Total	Mercury	<0.3mg/kg dw	10/27/98		MB03
Total	Nickel	120mg/kg dw	10/21/98		MB030
Total	Potassium	1000mg/kg dw	10/28/98		MB0327
Total	Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total	Silicon	380mg/kg dw	10/28/98		MB0327
Total	Silver	9.1mg/kg dw	10/21/98		MB0306
Total	Sodium	550mg/kg dw	10/28/98		MB0327
Total	Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total	Vanadium	45mg/kg dw	10/21/98		MB0306
Total	Zinc	5600mg/kg dw	10/21/98		MB0306
SPLP	Aluminum	0.15mg/l	10/26/98		MB0320
SPLP	Antimony by furnace method	0.019mg/l	10/12/98		MB0272
SPLP	Arsenic by furnace method	<0.001mg/l	10/26/98		MB0317
SPLP	Barium	<0.3mg/l	10/26/98		MB0320
SPLP	Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP	Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP	Calcium	41mg/l	10/26/98		MB0320
SPLP	Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S3-5 1345H 10/14/98 C

ULI I.D.: 28898023 Matrix: Soil

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP Copper	<0.02mg/l	10/26/98		MB0320
SPLP Iron	0.05mg/l	10/26/98		MB0320
SPLP Lead by furnace method	0.003mg/l	10/26/98		MB0311
SPLP Magnesium	<0.5mg/l	10/26/98		MB0320
SPLP Manganese	<0.02mg/l	10/26/98		MB0320
SPLP Mercury	<0.0004mg/l	10/27/98		MB0325
SPLP Nickel	<0.03mg/l	10/26/98		MB0320
SPLP Potassium	12mg/l	10/28/98		MB0327
SPLP Selenium by furnace method	0.002mg/l	10/26/98		MB0318
SPLP Silver	<0.05mg/l	10/26/98		MB0320
SPLP Sodium	7.9mg/l	10/28/98		MB0327
SPLP Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP Zinc	0.03mg/l	10/26/98		MB0320
Total Aluminum Oxide*	0.77%	10/21/98		CALCU.
Total Calcium Oxide*	2.4%	10/21/98		CALCU.
Total Ferric Oxide *	24%	10/21/98		CALCU.
Total Magnesium Oxide*	1.4%	10/21/98		CALCU.
Total Manganese Dioxide*	0.79%	10/21/98		CALCU.
Total Phosphorus Pentoxide*	0.08%	10/27/98		CALCU.
Total Silicon Dioxide (Metals)*	0.081%	10/28/98		CALCU.
SPLP Volatile Organic Compounds by 8240				
SPLP Benzene	<0.03mg/l	10/28/98		VM2136
SPLP Carbon Tetrachloride	<0.03mg/l	10/28/98		VM2136
SPLP Chlorobenzene	<0.03mg/l	10/28/98		VM2136
SPLP Chloroform	<0.03mg/l	10/28/98		VM2136
SPLP 1,4-Dichlorobenzene	<0.03mg/l	10/28/98		VM2136
SPLP 1,2-Dichloroethane	<0.03mg/l	10/28/98		VM2136
SPLP 1,1-Dichloroethene	<0.03mg/l	10/28/98		VM2136
SPLP Methyl Ethyl Ketone	<0.1mg/l	10/28/98		VM2136
SPLP Tetrachloroethene	<0.03mg/l	10/28/98		VM2136
SPLP Trichloroethene	<0.03mg/l	10/28/98		VM2136
SPLP Vinyl Chloride	<0.02mg/l	10/28/98		VM2136
SPLP Semivolatile Compounds by 8270				
SPLP Cresol, Total	<0.10mg/l	10/28/98		SA1760
SPLP 2,4-Dinitrotoluene	<0.05mg/l	10/28/98		SA1760
SPLP Hexachlorobenzene	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S3-5 1345H 10/14/98 C

ULI I.D.: 28898023

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	10/28/98		SA1760
SPLP	Hexachloroethane	<0.05mg/l	10/28/98		SA1760
SPLP	Nitrobenzene	<0.05mg/l	10/28/98		SA1760
SPLP	Pentachlorophenol	<0.10mg/l	10/28/98		SA1760
SPLP	Pyridine	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL: GLS
QC: um
Lab I.D.: 10170

98-53180 BSC-SURFACE
IMPOUNDMENTS S6-1 1325H 10/13/98 C

ULI I.D.: 28798023

Matrix: Soil

PARAMETERS		RESULTS	DATE ANAL.	KEY	FILE#
	Carbon Dioxide	<35mg/kg dw	10/21/98		WC3648
	Loss on Ignition	8.0%	10/20/98		WC3569
	Percent Solids	68%	10/14/98		WC3557
	Total Cyanide	21mg/kg dw	10/22/98		WC3615
	Total Phosphorus	190mg/kg dw	10/27/98		WC3718
SPLP	Total Cyanide	<0.02mg/l	10/22/98	01	WC3637
Total	Aluminum	1800mg/kg dw	10/21/98		MB0306
Total	Antimony by furnace method	4.4mg/kg dw	10/12/98		MB0272
Total	Arsenic by furnace method	15mg/kg dw	10/26/98		MB0317
Total	Barium	<40mg/kg dw	10/21/98		MB0306
Total	Beryllium by furnace method	0.82mg/kg dw	10/28/98		MB0328
Total	Cadmium	35mg/kg dw	10/21/98		MB0306
Total	Calcium	18,000mg/kg dw	10/21/98		MB0306
Total	Chromium	200mg/kg dw	10/21/98		MB0306
Total	Cobalt	780mg/kg dw	10/21/98		MB0306
Total	Copper	100mg/kg dw	10/21/98		MB0306
Total	Iron	230,000mg/kg dw	10/21/98		MB0306
Total	Lead by furnace method	580mg/kg dw	10/21/98		MB0306
Total	Magnesium	10,000mg/kg dw	10/21/98		MB0306
Total	Manganese	5400mg/kg dw	10/21/98		MB0306
Total	Mercury	0.40mg/kg dw	10/27/98		MB0325
Total	Nickel	160mg/kg dw	10/21/98		MB0306
Total	Potassium	680mg/kg dw	10/28/98		MB0327
Total	Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total	Silicon	280mg/kg dw	10/28/98		MB0327
Total	Silver	9.1mg/kg dw	10/21/98		MB0306
Total	Sodium	570mg/kg dw	10/28/98		MB0327
Total	Thallium by furnace method	30.5mg/kg dw	10/29/98		MB0331
Total	Vanadium	51mg/kg dw	10/21/98		MB0306
Total	Zinc	2700mg/kg dw	10/21/98		MB0306
SPLP	Aluminum	0.19mg/l	10/26/98		MB0320
SPLP	Antimony by furnace method	<0.003mg/l	10/12/98		MB0272
SPLP	Arsenic by furnace method	0.007mg/l	10/26/98		MB0317
SPLP	Barium	<0.3mg/l	10/26/98		MB0320
SPLP	Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP	Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP	Calcium	65mg/l	10/26/98		MB0320
SPLP	Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S6-1 1325H 10/13/98 C

ULI I.D.: 28798023 Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP	Copper	0.03mg/l	10/26/98		MB0320
SPLP	Iron	0.37mg/l	10/26/98		MB0320
SPLP	Lead by furnace method	0.003mg/l	10/26/98		MB0311
SPLP	Magnesium	<0.5mg/l	10/26/98		MB0320
SPLP	Manganese	<0.02mg/l	10/26/98		MB0320
SPLP	Mercury	<0.0004mg/l	10/27/98		MB0325
SPLP	Nickel	<0.03mg/l	10/26/98		MB0320
SPLP	Potassium	9.1mg/l	10/28/98		MB0327
SPLP	Selenium by furnace method	0.003mg/l	10/26/98		MB0318
SPLP	Silver	<0.05mg/l	10/26/98		MB0320
SPLP	Sodium	11mg/l	10/28/98		MB0327
SPLP	Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP	Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP	Zinc	0.03mg/l	10/26/98		MB0320
Total	Aluminum Oxide *	0.34%	10/21/98		CALCU.
Total	Calcium Oxide *	2.5%	10/21/98		CALCU.
Total	Ferric Oxide *	33%	10/21/98		CALCU.
Total	Magnesium Oxide *	1.7%	10/21/98		CALCU.
Total	Manganese Dioxide*	0.85%	10/21/98		CALCU.
Total	Phosphorus Pentoxide *	0.04%	10/27/98		CALCU.
Total	Silicon Dioxide (Metals)*	0.060%	10/28/98		CALCU.

SPLP Volatile Organic Compounds by 8240

SPLP	Benzene	<0.03mg/l	10/23/98		VM2128
SPLP	Carbon Tetrachloride	<0.03mg/l	10/23/98		VM2128
SPLP	Chlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	Chloroform	<0.03mg/l	10/23/98		VM2128
SPLP	1,4-Dichlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	1,2-Dichloroethane	<0.03mg/l	10/23/98		VM2128
SPLP	1,1-Dichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Methyl Ethyl Ketone	<0.1mg/l	10/23/98		VM2128
SPLP	Tetrachloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Trichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Vinyl Chloride	<0.02mg/l	10/23/98		VM2128

SPLP Semivolatile Compounds by 8270

SPLP	Cresol, Total	<0.1mg/l	10/28/98		SA1760
SPLP	2,4-Dinitrotoluene	<0.05mg/l	10/28/98		SA1760
SPLP	Hexachlorobenzene	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

ate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S6-1 1325H 10/13/98 C

ULI I.D.: 28798023

Matrix: Soil

PARAMETERS		RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	10/28/98		SA1760
SPLP	Hexachloroethane	<0.05mg/l	10/28/98		SA1760
SPLP	Nitrobenzene	<0.05mg/l	10/28/98		SA1760
SPLP	Pentachlorophenol	<0.1mg/l	10/28/98		SA1760
SPLP	Pyridine	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S6-2 1113H 10/13/98 C

ULI I.D.: 28798022

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
	Carbon Dioxide	<35mg/kg dw	10/21/98		WC3648
	Loss on Ignition	8.3%	10/20/98		WC3569
	Percent Solids	71%	10/14/98		WC3557
	Total Cyanide	2.2mg/kg dw	10/22/98		WC3615
	Total Phosphorus	240mg/kg dw	10/27/98		WC3718
SPLP	Total Cyanide	<0.02mg/l	10/22/98	01	WC3637
Total	Aluminum	2000mg/kg dw	10/21/98		MB0306
Total	Antimony by furnace method	3.0mg/kg dw	10/12/98		MB0272
Total	Arsenic by furnace method	4.0mg/kg dw	10/26/98		MB0317
Total	Barium	<40mg/kg dw	10/21/98		MB0306
Total	Beryllium by furnace method	0.75mg/kg dw	10/28/98		MB0328
Total	Cadmium	33mg/kg dw	10/21/98		MB0306
Total	Calcium	17,000mg/kg dw	10/21/98		MB0306
Total	Chromium	170mg/kg dw	10/21/98		MB0306
Total	Cobalt	730mg/kg dw	10/21/98		MB0306
Total	Copper	78mg/kg dw	10/21/98		MB0306
Total	Iron	210,000mg/kg dw	10/21/98		MB0306
Total	Lead by furnace method	530mg/kg dw	10/21/98		MB0306
Total	Magnesium	9900mg/kg dw	10/21/98		MB0306
Total	Manganese	4900mg/kg dw	10/21/98		MB0306
Total	Mercury	<0.3mg/kg dw	10/27/98		MB032
Total	Nickel	150mg/kg dw	10/21/98		MB030
Total	Potassium	780mg/kg dw	10/28/98		MB0327
Total	Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total	Silicon	210mg/kg dw	10/28/98		MB0327
Total	Silver	8.2mg/kg dw	10/21/98		MB0306
Total	Sodium	530mg/kg dw	10/28/98		MB0327
Total	Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total	Vanadium	50mg/kg dw	10/21/98		MB0306
Total	Zinc	2500mg/kg dw	10/21/98		MB0306
SPLP	Aluminum	0.24mg/l	10/26/98		MB0320
SPLP	Antimony by furnace method	<0.003mg/l	10/12/98		MB0272
SPLP	Arsenic by furnace method	<0.001mg/l	10/26/98		MB0317
SPLP	Barium	<0.3mg/l	10/26/98		MB0320
SPLP	Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP	Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP	Calcium	69mg/l	10/26/98		MB0320
SPLP	Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S6-2 1113H 10/13/98 C

ULI I.D.: 28798022

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP	Copper	0.09mg/l	10/26/98		MB0320
SPLP	Iron	0.22mg/l	10/26/98		MB0320
SPLP	Lead by furnace method	0.007mg/l	10/26/98		MB0311
SPLP	Magnesium	<0.5mg/l	10/26/98		MB0320
SPLP	Manganese	<0.02mg/l	10/26/98		MB0320
SPLP	Mercury	<0.0004mg/l	10/27/98		MB0325
SPLP	Nickel	0.04mg/l	10/26/98		MB0320
SPLP	Potassium	9.8mg/l	10/28/98		MB0327
SPLP	Selenium by furnace method	0.003mg/l	10/26/98		MB0318
SPLP	Silver	<0.05mg/l	10/26/98		MB0320
SPLP	Sodium	12mg/l	10/28/98		MB0327
SPLP	Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP	Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP	Zinc	0.03mg/l	10/26/98		MB0320
Total	Aluminum Oxide*	0.38%	10/21/98		CALCU.
Total	Calcium Oxide*	2.4%	10/21/98		CALCU.
Total	Ferric Oxide*	30%	10/21/98		CALCU.
Total	Magnesium Oxide*	1.6%	10/21/98		CALCU.
Total	Manganese Dioxide *	0.78%	10/21/98		CALCU.
Total	Phosphorus Pentoxide*	0.06%	10/27/98		CALCU.
Total	Silicon Dioxide (Metals)*	0.045%	10/28/98		CALCU.
SPLP Volatile Organic Compounds by 8240					
SPLP	Benzene	<0.03mg/l	10/23/98		VM2128
SPLP	Carbon Tetrachloride	<0.03mg/l	10/23/98		VM2128
SPLP	Chlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	Chloroform	<0.03mg/l	10/23/98		VM2128
SPLP	1,4-Dichlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	1,2-Dichloroethane	<0.03mg/l	10/23/98		VM2128
SPLP	1,1-Dichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Methyl Ethyl Ketone	<0.1mg/l	10/23/98		VM2128
SPLP	Tetrachloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Trichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Vinyl Chloride	<0.02mg/l	10/23/98		VM2128
SPLP Semivolatile Compounds by 8270					
SPLP	Cresol, Total	<0.1mg/l	10/28/98		SA1760
SPLP	2,4-Dinitrotoluene	<0.05mg/l	10/28/98		SA1760
SPLP	Hexachlorobenzene	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S6-2 1113H 10/13/98 C

ULI I.D.: 28798022 Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	10/28/98		SA1760
SPLP	Hexachloroethane	<0.05mg/l	10/28/98		SA1760
SPLP	Nitrobenzene	<0.05mg/l	10/28/98		SA1760
SPLP	Pentachlorophenol	<0.1mg/l	10/28/98		SA1760
SPLP	Pyridine	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S6-3 1500H 10/13/98 C

ULI I.D.: 28798024
Matrix: Soil

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Carbon Dioxide	<33mg/kg dw	10/21/98		WC3648
Loss on Ignition	7.0%	10/20/98		WC3569
Percent Solids	70%	10/14/98		WC3557
Total Cyanide	2.5mg/kg dw	10/22/98		WC3615
Total Phosphorus	220mg/kg dw	10/27/98		WC3718
SPLP Total Cyanide	<0.02mg/l	10/22/98	01	WC3637
Total Aluminum	2000mg/kg dw	10/21/98		MB0306
Total Antimony by furnace method	3.5mg/kg dw	10/12/98		MB0272
Total Arsenic by furnace method	14mg/kg dw	10/26/98		MB0317
Total Barium	<40mg/kg dw	10/21/98		MB0306
Total Beryllium by furnace method	0.81mg/kg dw	10/28/98		MB0328
Total Cadmium	36mg/kg dw	10/21/98		MB0306
Total Calcium	17,000mg/kg dw	10/21/98		MB0306
Total Chromium	200mg/kg dw	10/21/98		MB0306
Total Cobalt	780mg/kg dw	10/21/98		MB0306
Total Copper	95mg/kg dw	10/21/98		MB0306
Total Iron	230,000mg/kg dw	10/21/98		MB0306
Total Lead by furnace method	460mg/kg dw	10/21/98		MB0306
Total Magnesium	8900mg/kg dw	10/21/98		MB0306
Total Manganese	5000mg/kg dw	10/21/98		MB0306
Total Mercury	<0.3mg/kg dw	10/27/98		MB0325
Total Nickel	160mg/kg dw	10/21/98		MB0306
Total Potassium	870mg/kg dw	10/28/98		MB0327
Total Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total Silicon	190mg/kg dw	10/28/98		MB0327
Total Silver	9.0mg/kg dw	10/21/98		MB0306
Total Sodium	560mg/kg dw	10/28/98		MB0327
Total Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total Vanadium	51mg/kg dw	10/21/98		MB0306
Total Zinc	2300mg/kg dw	10/21/98		MB0306
SPLP Aluminum	0.25mg/l	10/26/98		MB0320
SPLP Antimony by furnace method	<0.003mg/l	10/12/98		MB0272
SPLP Arsenic by furnace method	3.003mg/l	10/26/98		MB0317
SPLP Barium	<0.3mg/l	10/26/98		MB0320
SPLP Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP Calcium	57mg/l	10/26/98		MB0320
SPLP Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180 BSC-SURFACE
IMPOUNDMENTS S6-3 1500H 10/13/98 C

ULI I.D.: 28798024 Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP	Copper	<0.02mg/l	10/26/98		MB0320
SPLP	Iron	0.04mg/l	10/26/98		MB0320
SPLP	Lead by furnace method	<0.001mg/l	10/26/98		MB0311
SPLP	Magnesium	<0.5mg/l	10/26/98		MB0320
SPLP	Manganese	<0.02mg/l	10/26/98		MB0320
SPLP	Mercury	<0.0004mg/l	10/27/98		MB0325
SPLP	Nickel	<0.03mg/l	10/26/98		MB0320
SPLP	Potassium	12mg/l	10/28/98		MB0327
SPLP	Selenium by furnace method	0.003mg/l	10/26/98		MB0318
SPLP	Silver	<0.05mg/l	10/26/98		MB0320
SPLP	Sodium	18mg/l	10/28/98		MB0327
SPLP	Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP	Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP	Zinc	0.03mg/l	10/26/98		MB0320
Total	Aluminum Oxide*	0.38%	10/21/98		CALCU.
Total	Calcium Oxide*	2.4%	10/21/98		CALCU.
Total	Ferric Oxide*	33%	10/21/98		CALCU.
Total	Magnesium Oxide*	1.5%	10/21/98		CALCU.
Total	Manganese Dioxide*	0.79%	10/21/98		CALCU.
Total	Phosphorus Pentoxide*	0.05%	10/27/98		CALCU
Total	Silicon Dioxide (Metals)*	0.041%	10/28/98		CALCU
SPLP Volatile Organic Compounds by 8240					
SPLP	Benzene	<0.03mg/l	10/23/98		VM2128
SPLP	Carbon Tetrachloride	<0.03mg/l	10/23/98		VM2128
SPLP	Chlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	Chloroform	<0.03mg/l	10/23/98		VM2128
SPLP	1,4-Dichlorobenzene	<0.03mg/l	10/23/98		VM2128
SPLP	1,2-Dichloroethane	<0.03mg/l	10/23/98		VM2128
SPLP	1,1-Dichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Methyl Ethyl Ketone	<0.1mg/l	10/23/98		VM2128
SPLP	Tetrachloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Trichloroethene	<0.03mg/l	10/23/98		VM2128
SPLP	Vinyl Chloride	<0.02mg/l	10/23/98		VM2128
SPLP Semivolatile Compounds by 8270					
SPLP	Cresol, Total	<0.1mg/l	10/28/98		SA1760
SPLP	2,4-Dinitrotoluene	<0.05mg/l	10/28/98		SA1760
SPLP	Hexachlorobenzene	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170

98-53180 BSC-SURFACE
IMPOUNDMENTS S6-3 1500H 10/13/98 C

ULI I.D.: 28798024

Matrix: Soil

PARAMETERS		RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	10/28/98		SA1760
SPLP	Hexachloroethane	<0.05mg/l	10/28/98		SA1760
SPLP	Nitrobenzene	<0.05mg/l	10/28/98		SA1760
SPLP	Pentachlorophenol	<0.1mg/l	10/28/98		SA1760
SPLP	Pyridine	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S6-4 0935H 10/14/98 C

ULI I.D.: 28898021
Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
	Carbon Dioxide	<36mg/kg dw	10/21/98		WC3648
	Loss on Ignition	8%	10/20/98		WC3608
	Percent Solids	69%	10/15/98		WC3575
	Total Cyanide	4.3mg/kg dw	10/22/98		WC3651
	Total Phosphorus	370mg/kg dw	10/27/98		WC3718
SPLP	Total Cyanide	<0.01mg/l	10/27/98		WC3637
Total	Aluminum	2700mg/kg dw	10/21/98		MB0306
Total	Antimony by furnace method	3.5mg/kg dw	10/12/98		MB0272
Total	Arsenic by furnace method	13mg/kg dw	10/26/98		MB0317
Total	Barium	<40mg/kg dw	10/21/98		MB0306
Total	Beryllium by furnace method	0.91mg/kg dw	10/28/98		MB0328
Total	Cadmium	35mg/kg dw	10/21/98		MB0306
Total	Calcium	18,000mg/kg dw	10/21/98		MB0306
Total	Chromium	170mg/kg dw	10/21/98		MB0306
Total	Cobalt	750mg/kg dw	10/21/98		MB0306
Total	Copper	72mg/kg dw	10/21/98		MB0306
Total	Iron	220,000mg/kg dw	10/21/98		MB0306
Total	Lead by furnace method	610mg/kg dw	10/21/98		MB0306
Total	Magnesium	11,000mg/kg dw	10/21/98		MB0306
Total	Manganese	5500mg/kg dw	10/21/98		MB0306
Total	Mercury	<0.3mg/kg dw	10/27/98		MB032
Total	Nickel	150mg/kg dw	10/21/98		MB030
Total	Potassium	800mg/kg dw	10/28/98		MB0327
Total	Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total	Silicon	230mg/kg dw	10/28/98		MB0327
Total	Silver	8.7mg/kg dw	10/21/98		MB0306
Total	Sodium	560mg/kg dw	10/28/98		MB0327
Total	Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total	Vanadium	49mg/kg dw	10/21/98		MB0306
Total	Zinc	5200mg/kg dw	10/21/98		MB0306
SPLP	Aluminum	0.26mg/l	10/26/98		MB0320
SPLP	Antimony by furnace method	<0.003mg/l	10/12/98		MB0272
SPLP	Arsenic by furnace method	0.002mg/l	10/26/98		MB0317
SPLP	Barium	<0.3mg/l	10/26/98		MB0320
SPLP	Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP	Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP	Calcium	74mg/l	10/26/98		MB0320
SPLP	Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

APPROVAL:
QC:
Lab I.D.: 10170

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

98-53180/BSC-SURFACE
IMPOUNDMENTS S6-4 0935H 10/14/98 C

ULI I.D.: 28898021
Matrix: Soil

PARAMETERS		RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP	Copper	<0.02mg/l	10/26/98		MB0320
SPLP	Iron	0.09mg/l	10/26/98		MB0320
SPLP	Lead by furnace method	0.002mg/l	10/26/98		MB0311
SPLP	Magnesium	<0.5mg/l	10/26/98		MB0320
SPLP	Manganese	<0.02mg/l	10/26/98		MB0320
SPLP	Mercury	<0.0004mg/l	10/27/98		MB0325
SPLP	Nickel	0.05mg/l	10/26/98		MB0320
SPLP	Potassium	11mg/l	10/28/98		MB0327
SPLP	Selenium by furnace method	0.003mg/l	10/26/98		MB0318
SPLP	Silver	<0.05mg/l	10/26/98		MB0320
SPLP	Sodium	9.0mg/l	10/28/98		MB0327
SPLP	Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP	Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP	Zinc	0.20mg/l	10/26/98		MB0320
Total	Aluminum Oxide*	0.51%	10/21/98		CALCU.
Total	Calcium Oxide *	2.5%	10/21/98		CALCU.
Total	Ferric Oxide *	31%	10/21/98		CALCU.
Total	Magnesium Oxide*	1.8%	10/21/98		CALCU.
Total	Manganese Dioxide*	0.87%	10/21/98		CALCU.
Total	Phosphorus Pentoxide*	0.09%	10/27/98		CALCU.
Total	Silicon Dioxide (Metals)*	0.049%	10/28/98		CALCU.
SPLP Volatile Organic Compounds by 8240					
SPLP	Benzene	<0.03mg/l	10/28/98		VM2136
SPLP	Carbon Tetrachloride	<0.03mg/l	10/28/98		VM2136
SPLP	Chlorobenzene	<0.03mg/l	10/28/98		VM2136
SPLP	Chloroform	<0.03mg/l	10/28/98		VM2136
SPLP	1,4-Dichlorobenzene	<0.03mg/l	10/28/98		VM2136
SPLP	1,2-Dichloroethane	<0.03mg/l	10/28/98		VM2136
SPLP	1,1-Dichloroethene	<0.03mg/l	10/28/98		VM2136
SPLP	Methyl Ethyl Ketone	<0.1mg/l	10/28/98		VM2136
SPLP	Tetrachloroethene	<0.03mg/l	10/28/98		VM2136
SPLP	Trichloroethene	<0.03mg/l	10/28/98		VM2136
SPLP	Vinyl Chloride	<0.02mg/l	10/28/98		VM2136
SPLP Semivolatile Compounds by 8270					
SPLP	Cresol, Total	<0.1mg/l	10/30/98		SA1762
SPLP	2,4-Dinitrotoluene	<0.05mg/l	10/30/98		SA1762
SPLP	Hexachlorobenzene	<0.05mg/l	10/30/98		SA1762

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S6-4 0935H 10/14/98 C

ULI I.D.: 28898021 Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	10/30/98		SA1762
SPLP	Hexachloroethane	<0.05mg/l	10/30/98		SA1762
SPLP	Nitrobenzene	<0.05mg/l	10/30/98		SA1762
SPLP	Pentachlorophenol	<0.1mg/l	10/30/98		SA1762
SPLP	Pyridine	<0.05mg/l	10/30/98		SA1762
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	10/30/98		SA1762
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	10/30/98		SA1762

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S6-5 1125H 10/14/98 C

ULI I.D.: 28898020

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
	Carbon Dioxide	<36mg/kg dw	10/21/98		WC3648
	Loss on Ignition	11%	10/20/98		WC3608
	Percent Solids	68%	10/15/98		WC3575
	Total Cyanide	11mg/kg dw	10/22/98		WC3651
	Total Phosphorus	300mg/kg dw	10/27/98		WC3718
SPLP	Total Cyanide	<0.01mg/l	10/27/98		WC3637
Total	Aluminum	2200mg/kg dw	10/21/98		MB0306
Total	Antimony by furnace method	3.5mg/kg dw	10/12/98		MB0272
Total	Arsenic by furnace method	10mg/kg dw	10/26/98		MB0317
Total	Barium	<40mg/kg dw	10/21/98		MB0306
Total	Beryllium by furnace method	0.81mg/kg dw	10/28/98		MB0328
Total	Cadmium	36mg/kg dw	10/21/98		MB0306
Total	Calcium	18,000mg/kg dw	10/21/98		MB0306
Total	Chromium	190mg/kg dw	10/21/98		MB0306
Total	Cobalt	770mg/kg dw	10/21/98		MB0306
Total	Copper	85mg/kg dw	10/21/98		MB0306
Total	Iron	230,000mg/kg dw	10/21/98		MB0306
Total	Lead by furnace method	550mg/kg dw	10/21/98		MB0306
Total	Magnesium	9900mg/kg dw	10/21/98		MB0306
Total	Manganese	5500mg/kg dw	10/21/98		MB0306
Total	Mercury	0.32mg/kg dw	10/27/98		MB0325
Total	Nickel	150mg/kg dw	10/21/98		MB0306
Total	Potassium	800mg/kg dw	10/28/98		MB0327
Total	Selenium by furnace method	<0.2mg/kg dw	10/26/98		MB0318
Total	Silicon	170mg/kg dw	10/28/98		MB0327
Total	Silver	8.4mg/kg dw	10/21/98		MB0306
Total	Sodium	490mg/kg dw	10/28/98		MB0327
Total	Thallium by furnace method	<0.5mg/kg dw	10/29/98		MB0331
Total	Vanadium	54mg/kg dw	10/21/98		MB0306
Total	Zinc	3100mg/kg dw	10/21/98		MB0306
SPLP	Aluminum	0.23mg/l	10/26/98		MB0320
SPLP	Antimony by furnace method	<0.003mg/l	10/12/98		MB0272
SPLP	Arsenic by furnace method	0.004mg/l	10/26/98		MB0317
SPLP	Barium	<0.3mg/l	10/26/98		MB0320
SPLP	Beryllium by furnace method	<0.001mg/l	10/28/98		MB0328
SPLP	Cadmium	<0.005mg/l	10/26/98		MB0320
SPLP	Calcium	72mg/l	10/26/98		MB0320
SPLP	Chromium	<0.05mg/l	10/26/98		MB0320

dw = Dry weight

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S6-5 1125H 10/14/98 C

ULI I.D.: 28898020 Matrix: Soil

PARAMETERS		RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Cobalt	<0.05mg/l	10/26/98		MB0320
SPLP	Copper	0.03mg/l	10/26/98		MB0320
SPLP	Iron	0.04mg/l	10/26/98		MB0320
SPLP	Lead by furnace method	<0.001mg/l	10/26/98		MB0311
SPLP	Magnesium	<0.5mg/l	10/26/98		MB0320
SPLP	Manganese	<0.02mg/l	10/26/98		MB0320
SPLP	Mercury	<0.0004mg/l	10/27/98		MB0325
SPLP	Nickel	0.04mg/l	10/26/98		MB0320
SPLP	Potassium	14mg/l	10/28/98		MB0327
SPLP	Selenium by furnace method	0.003mg/l	10/26/98		MB0318
SPLP	Silver	<0.05mg/l	10/26/98		MB0320
SPLP	Sodium	9.0mg/l	10/28/98		MB0327
SPLP	Thallium by furnace method	<0.003mg/l	10/29/98		MB0331
SPLP	Vanadium	<0.3mg/l	10/26/98		MB0320
SPLP	Zinc	0.32mg/l	10/26/98		MB0320
Total	Aluminum Oxide*	0.42%	10/21/98		CALCU.
Total	Calcium Oxide *	2.5%	10/21/98		CALCU.
Total	Ferric Oxide*	33%	10/21/98		CALCU.
Total	Magnesium Oxide*	1.6%	10/21/98		CALCU.
Total	Manganese Dioxide *	0.87%	10/21/98		CALCU.
Total	Phosphorus Pentoxide *	0.07%	10/27/98		CALCU
Total	Silicon Dioxide (Metals)*	0.036%	10/28/98		CALCU.
SPLP Volatile Organic Compounds by 8240					
SPLP	Benzene	<0.03mg/l	10/28/98		VM2136
SPLP	Carbon Tetrachloride	<0.03mg/l	10/28/98		VM2136
SPLP	Chlorobenzene	<0.03mg/l	10/28/98		VM2136
SPLP	Chloroform	<0.03mg/l	10/28/98		VM2136
SPLP	1,4-Dichlorobenzene	<0.03mg/l	10/28/98		VM2136
SPLP	1,2-Dichloroethane	<0.03mg/l	10/28/98		VM2136
SPLP	1,1-Dichloroethene	<0.03mg/l	10/28/98		VM2136
SPLP	Methyl Ethyl Ketone	<0.1mg/l	10/28/98		VM2136
SPLP	Tetrachloroethene	<0.03mg/l	10/28/98		VM2136
SPLP	Trichloroethene	<0.03mg/l	10/28/98		VM2136
SPLP	Vinyl Chloride	<0.02mg/l	10/28/98		VM2136
SPLP Semivolatile Compounds by 8270					
SPLP	Cresol, Total	<0.10mg/l	10/28/98		SA1760
SPLP	2,4-Dinitrotoluene	<0.05mg/l	10/28/98		SA1760
SPLP	Hexachlorobenzene	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

* Calculation based upon total ion concentration.

DATE: 11/04/98

Upstate Laboratories, Inc.
Analysis Results
Report Number: 28798022
Client I.D.: MAXIM TECHNOLOGIES-HAMBURG
Sampled by: Client

APPROVAL:
QC:
Lab I.D.: 10170
98-53180/BSC-SURFACE
IMPOUNDMENTS S6-5 1125H 10/14/98 C

ULI I.D.: 28898020

Matrix: Soil

	PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
SPLP	Hexachlorobutadiene	<0.05mg/l	10/28/98		SA1760
SPLP	Hexachloroethane	<0.05mg/l	10/28/98		SA1760
SPLP	Nitrobenzene	<0.05mg/l	10/28/98		SA1760
SPLP	Pentachlorophenol	<0.10mg/l	10/28/98		SA1760
SPLP	Pyridine	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,5-Trichlorophenol	<0.05mg/l	10/28/98		SA1760
SPLP	2,4,6-Trichlorophenol	<0.05mg/l	10/28/98		SA1760

dw = Dry weight

KEY PAGE

1 MATRIX INTERFERENCE PRECLUDES LOWER DETECTION LIMITS
2 MATRIX INTERFERENCE
3 PRESENT IN BLANK
4 ANALYSIS NOT PERFORMED BECAUSE OF INSUFFICIENT SAMPLE
5 THE PRESENCE OF OTHER TARGET ANALYTE(S) PRECLUDES LOWER DETECTION LIMITS
6 BLANK CORRECTED
7 HEAD SPACE PRESENT IN SAMPLE
8 QUANTITATION LIMIT IS GREATER THAN THE CALCULATED REGULATORY LEVEL. THE QUANTITATION LIMIT THEREFORE BECOMES THE REGULATORY LEVEL.
9 THE OIL WAS TREATED AS A SOLID AND LEACHED WITH EXTRACTION FLUID
10 ADL(AVERAGE DETECTION LIMITS)
11 PQL(PRACTICAL QUANTITATION LIMITS)
12 SAMPLE ANALYZED OVER HOLDING TIME
13 DISSOLVED VALUE MAY BE HIGHER THAN TOTAL DUE TO CONTAMINATION FROM THE FILTERING PROCEDURE
14 SAMPLED BY ULI
15 DISSOLVED VALUE MAY BE HIGHER THAN TOTAL; HOWEVER, THE VALUES ARE WITHIN EXPERIMENTAL ERROR
16 AN INHIBITORY FACTOR WAS OBSERVED IN THIS ANALYSIS
17 PARAMETER NOT ANALYZED WITHIN 15 MINUTES OF SAMPLING
18 THE SERIAL DILUTION OF THIS SAMPLE SUGGESTS A POSSIBLE PHYSICAL AND/OR CHEMICAL INTERFERENT IN THIS DETERMINATION. THE DATA MAY BE BIASED EITHER HIGH OR LOW.
19 CALCULATION BASED ON DRY WEIGHT
20 INDICATES AN ESTIMATED VALUE, DETECTED BUT BELOW THE PRACTICAL QUANTITATION LIMITS
21 UG/KG AS REC.D / UG/KG DRY WT
22 MG/KG AS REC.D / MG/KG DRY WT
23 INSUFFICIENT SAMPLE PRECLUDES LOWER DETECTION LIMITS
24 SAMPLE DILUTED/BLANK CORRECTED
25 ND(NON-DETECTED)
26 MATRIX INTERFERENCE PRECLUDES LOWER DETECTION LIMITS/BLANK CORRECTED
27 SPIKE RECOVERY ABNORMALLY HIGH/LOW DUE TO MATRIX INTERFERENCE
28 POST-DIGESTION SPIKE FOR FURNACE AA ANALYSIS IS OUTSIDE OF THE CONTROL LIMITS (85-115%); HOWEVER, THE SAMPLE CONCENTRATION IS BELOW THE PQL
29 ANALYZED BY METHOD OF STANDARD ADDITIONS
30 METHOD PERFORMANCE STUDY HAS NOT BEEN COMPLETED/ND(NON-DETECTED)
31 FIELD MEASURED PARAMETER TAKEN BY CLIENT
32 TARGET ANALYTE IS BIODEGRADED AND/OR ENVIRONMENTALLY WEATHERED
33 NON-POTABLE WATER SOURCE
34 THE QUALITY CONTROL RESULTS FOR THIS ANALYSIS INDICATE A POSITIVE BIAS OF 1-5 MG/L. THE POSITIVE BIAS FALLS BELOW THE PUBLISHED EPA REGULATORY DETECTION LIMIT OF 5 MG/L BUT ABOVE 1 MG/L.
35 THE HYDROCARBONS DETECTED IN THE SAMPLE DID NOT CROSS-MATCH WITH COMMON PETROLEUM DISTILLATES
36 MATRIX INTERFERENCE CAUSING SPIKES TO RESULT IN LESS THAN 50.0% RECOVERY
37 MILLIGRAMS PER LITER (MG/L) / POUNDS (LBS) PER DAY
38 MILLIGRAMS PER LITER (MG/L) OF RESIDUAL CHLORINE (CL2) / POUNDS (LBS) PER DAY OF CL2
39 MICROGRAMS PER LITER (UG/L) / POUNDS (LBS) PER DAY
40 MILLIGRAMS PER LITER (MG/L) LINEAR ALKYL SULFONATE (LAS) / POUNDS (LBS) PER DAY LAS
41 RESULTS ARE REPORTED ON AN AS REC.D BASIS
42 THE SAMPLE WAS ANALYZED ON A TOTAL BASIS; THE TEST RESULT CAN BE COMPARED TO THE TCLP REGULATORY CRITERIA BY DIVIDING THE TEST RESULT BY 20, CREATING A THEORETICAL TCLP VALUE
43 METAL BY CONCENTRATION PROCEDURE
44 POSSIBLE CONTAMINATION FROM FIELD/LABORATORY

Upst Laboratories, Inc.
6034 Corporate Drive • E. Syracuse, NY 13057-1017
(315) 437 0255
Fax 437 1209

Chain Of Custody Record

P.O 37,456
4SH1875
10/28 1400

Client: Maxim			Client Project # / Project Name 98-53180 BSC-Surface Impoundments ~~Sampling~~ SB			No. of Con-tain-ers											Special Turnaround Time Weeks ~~(Lab Notification~~ required)
Client Contact: Jeff Contino	Phone #		Site Location (city/state)														
Sample Location:	Date	Time	Matrix	Grab or Comp.	ULI Internal Use Only		1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	Remarks
S6-2	10/13/98	1113	Soil	Comp	2878022	3	X	XX	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	
S6-1	10/13/98	1325	Soil	Comp	23	3	X	XX	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	
S6-3	10/13/98	1500	Soil	Comp	24	3	X	XX	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	
					Total	9	3	6									

JB

JB

JB

JB

Parameter and method	sample bottle: type	size	pres.
See Attached Sheets			
(T-Ag, Al, As*, Ba, Be*, Ca, Cd, ~~Cr, Ch~~ Co, Cr, Cu, Fe, K, Mg, Mn, Ni, Pb*, Sb*)⁴⁰			
(T-Se*, Si, Tl*, V, Zn, Hg, Na, Al_2O_3, CaO, Fe_2O_3, MgO, MnO_2)			
(T-SiO_2, P_2O_5)			
(LOI, CO_2) (T-CN, T-P)			
(SPLP-Ag, Al, As*, Ba, Be*, Ca, Cd, Co, Cr, Cu, Fe, Hg, Mg, Mn, Ni)			
(SPLP-K, Na, Pb*, Sb*, Se*, Tl*, V, Zn, SPLP T-CN)			
(SPLP 8240 vols (TCLP list))			
(SPLP 8270 semi-vols (TCLP list))⁴⁰			
(% solids)⁴⁰			

Note: The numbered columns above cross-reference with the numbered columns in the upper right-hand corner.

Sampled by: (Please Print) S. Bochenek

Company: Maxim

ULI Internal Use Only
Delivery (check one):
☐ ULI Sampled
☐ Pickup
☑ Dropoff
☐ ~~CC~~

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	10/13/98	1515 1715	
	10/13/98	1230	
Relinquished by: (Signature)	Date 10/14/98	Time 0805	Rec'd for Lab by: (Signature) H Dom

Syracuse Rochester [✓ Buffalo] Albany Binghamton Fair Lawn (N.J)

Upstate Laboratories, Inc.
6034 Corporate Drive • E. Syracuse, NY 13057-1017
(315) 437 0255
Fax 437 1209

Chain Of Custody Record

T034/4:

4 Sheets

10/29 1100

Client: Maxim		Client Project # / Project Name 98-5380 / BSC-Surface Impoundments					No. of Con-tain-ers										Special Turnaround Time 4 days (Lab Notification required)
Client Contact: J. Contino	Phone # 649 8110	Site Location (city/state)															
Sample Location:	Date	Time	Matrix	Grab or Comp.	ULI Internal Use Only			1)	2)	3)	4)	5)	6)	7)	8)	9)	10) Remarks
S6-5	10/14/98	1125	Soil	Comp	28898020		3	X	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
S6-4	10/14/98	0935	Soil	Comp	21		3	X	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
S3-3	10/14/98	1445	Soil	Comp	22		3	X	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
S3-5	10/14/99	1345	Soil	Comp	23		3	X	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
					Total		12	4	8								

JB

JB

JB

Parameter and method	sample bottle:	type	size	pres.
1) See Attached Sheets				
2) (T-Ag, Al, As*, Ba, Be*, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Ni, Pb*, Sb*)				
3) (T-Se*, Si, Tl*, V, Zn, Hg, Na, Al_2O_3, CaO, Fe_2O_3, MgO, MnO_2)				
4) (T-SiO_2) (P_2O_5)				
5) (LOI, CO_2, T-CN, T-P)				
6) (SPLP-Ag, Al, As* Ba, Be*, Ca, Cd, Co, Cr, Cu, Fe, Hg, Mg, Mn)				
7) (SPLP-Ni, K, Na, Pb*, Sb*, Se*, Tl*, V, Zn) (SPLP-TCN)				
8) (SPLP 8240 vols (TCLP list))				
9) (SPLP 8270 semivols (TCLP list))				
10) (% Solids)				

Note: The numbered columns above cross-reference with the numbered columns in the upper right-hand corner.

Sampled by: (Please Print) S Bochner

Company: Maxim

ULI Internal Use Only
Delivery (check one):
☐ ULI Sampled
☐ Pickup ☐ ~~Dropoff~~
☒ CC

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	10/14/98	1610	
	10/14/98	1730	

Relinquished by: (Signature)	Date	Time	Rec'd for Lab by: (Signature)
	10/15/98	0305	

Syracuse Rochester [✓ Buffalo] Albany Binghamton Fair Lawn (NJ)

P-3 436

10/30 HOD

Jpst 'e Laboratories, Inc.
6034 Co te Drive • E. Syracuse, NY 13057-1017
(315) 437 0255 Fax 437 1209

Chain Of Custody Record

Client: Maxim

Client Contact: J. Contino

Phone #:

Client Project # / Project Name: 1853180 BSC-Surface Impoundments

Site Location (city/state):

Special Turnaround Time [illegible] (Lab Notification required)

Sample Location:	Date	Time	Matrix	Grab or Comp.	ULI Internal Use Only	No. of Containers	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	Remarks
S2-1	10/15/98	1520	Soil	Com	28998001	3	X	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	
S2-2		1410			2	3	X	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	
S2-3		1315			3	3	X	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	
S3-4		1110			4	3	X	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	JD
S3-2		1020			5	3	X	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	
S3-1		0925			6	3	X	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	JD
					Total	18	6	12									

Parameter and method — sample bottle: type / size / pres.

1) See Attached Sheets FROM
2) PREVIOUS BSC IMP SLUDGE PARAMETERS
3) (T-Ag, Al, As*, Ba, Be*, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Ni, Pb*, Sb*, Se*, Si, Tl*, V, Zn, Hg, Na)
4) (T-Al_2O_3, CaO, Fe_2O_3, MgO, MnO_2, SiO_2, P_2O_5)
5) (LOI, CO_2, T-CN, T-P)
6) (SPLP-Ag, Al, As*, Ba, Be*, Ca, Cd, Co, Cr, Cu, Fe, Hg, Mg, Mn, Ni, K)
7) (SPLP-Na, Pb*, Sb*, Se*, Tl*, V, Zn) (SPLP-TCN)
8) (SPLP 8240 vols (TCLP list))
9) (SPLP 8270 semi-vols (TCLP list))
10) (% solids)

Note: The numbered columns above cross-reference with the numbered columns in the upper right-hand corner.

Sampled by: (Please Print) STEPHEN Bochnel

Company: Maxim

ULI Internal Use Only
Delivery (check one):
☐ ULI Sampled
☐ Pickup ☒ Dropoff
☐ CC

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	10/15/98	1630	
	10/15/98	1230	

Relinquished by: (Signature)	Date	Time	Rec'd for Lab by: (Signature)
	10/16/98	0750	H Dona

Syracuse Rochester [✓ Buffalo] Albany Binghamton Fair Lawn (NJ)

Upstate Laboratories, Inc.
6034 Corporate Drive • E. Syracuse, NY 13057-1017
(315) 437 0255 Fax 437 1209

Chain Of Custody Record

11/3 HDD

Client: BSC (Rclm)

Client Project # / Project Name: 98-53180 / BSC-Surface Impoundments

Client Contact: J. Contino

Phone #:

Site Location (city/state): PD #37456

Special Turnaround Time Wendy/Dan Clark (Lab Notification required)

Sample Location:	Date	Time	Matrix	Grab or Comp.	ULI Internal Use Only	No. of Containers	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	Remarks
S2-4	10/19/98	1340	Soil/Sludge	Comp	99398033	3	XX	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	HO
S2-5	"	1455	" "	"	34	3	XX	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	HO
						6 = Total											

Jeff Contino

Parameter and method	sample bottle: type	size	pres.
) 16 oz Glass } See Attached Sheets			
) 125mL Glass			
) (T-Ag, Al, As*, Ba, Be*, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Ni, Pb*, Sb*, Se*, Si, Tl*, V, Zn, Hg, Na)^{HO}			
) (T-Al_2O_3, CaO, Fe_2O_3, MgO, MnO_2, SiO_2, P_2O_5)^{HO}			
) (LOI, CO_2, T-CN, T-P)^{HO}			
) (SPLP-Ag, Al, As*, Ba, Be*, Ca, Cd, Co, Cr, Cu, Fe, Hg, Mg, Mn, Ni, K)^{HO}			
) (SPLP-Na, Pb*, Sb*, Se*, Tl*, V, Zn)^{HO} (SPLP - TCN)^{HO}			
) (SPLP 8270 Semi-vols (TCLP list))^{HO}			
) (SPLP 8240 vols (TCLP list))^{HO}			
0) (% Solids)^{HO}			

Note: The numbered columns above cross-reference with the numbered columns in the upper right-hand corner.

Sampled by: (Please Print) Jeff Contino

Company: MAXIM

ULI Internal Use Only
Delivery (check one):
☐ ULI Sampled
☐ Pickup ☒ Dropoff
~~☐ CC~~ CDL

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Jeff Contino	10/19/98	1650	
	10/19/98	1730	

Relinquished by: (Signature)	Date	Time	Rec'd for Lab by: (Signature)
	10/20/98	0755	S. Gillson

Syracuse Rochester [✓ Buffalo] Albany Binghamton Fair Lawn (NJ)

Attachment 12

Analytical Chemistry Data From Drill Cores Taken In 1988

	% Water	%O%G	Fe	Zn	Pb	Na2O	K2O	C
S-2	36.0	3.4	41.5	1.1	0.15	0.10	0.19	9.1
S-3	33.6	2.3	43.0	0.81	0.14	0.12	0.15	8.3
S-6	31.5	0.2	49.4	0.43	0.09	0.08	0.13	2.7

Attachment 13

Effect of Using S-6 Sludge in the Burns Harbor Sinter Plant

(Calculation based on SWIM model for July, 1998)

Analyses of Sludge

H2O	12.0%(field dried)	Pb	0.09%
O&G	0.23%	Na2O	0.10%
Fe	49.8%	K2O	0.14%
Zn	0.45%	C(total)	2.60%

Assumptions

50 TPD of 12% H2O sludge replaces purchased mill scale. Mill scale analyses 70.3% Fe. Therefore, the Fe replacement ratio is 70.3/49.8 = 1.41. 50 TPD of S-6 sludge @ 12% H2O = 44TPD dry solids/1.41 = 31.2 DTPD of mill scale replaced or 31.2/0.9513 = 32.8 net TPD @ 4.87% H2O.

From the SWIM model, the effect of replacing 32.8 net TPD of mill scale with 50 net TPD of S-6 sludge will add the following amount of constituents to the operations listed:

	lbs/month	lbs/NTHM
Zn in blast furnace	12,748	0.029
Pb in blast furnace	1,960	0.004
Na2O in blast furnace	1,336	0.003
K2O in blast furnace	3,243	0.007
Pb in SWTP effluent	25	-
Pb in sinter plant stack	239	-

Time to Empty S-6

50 TPD @ 12% H2O equates to 64.5 TPD of "as is" sludge @ 31.8% H2O. The estimated amount of material in S-6 is 55,400T. Therefore, 55,400/64.5 = 859 days to consume all of the S-6 sludge at one sinter plant. If two sinter plants could consume 50 TPD, then the time would be cut in half or 429.5 days.

Bethlehem Steel Corporation

BETHLEHEM, PA 18016-7699

June 13, 2000

Via Federal Express

Mr. James G. Strickland, P.E.
Regional Hazardous Materials Engineer
Division of Solid and Hazardous Materials
New York State Department of
Environmental Conservation
Region 9
270 Michigan Avenue
Buffalo, New York 14203-2999

Dear Mr. Strickland:

The attached package is the Report of Analysis provided by the laboratory on the samples taken of the solid waste management unit SWMU-1. Because of safety considerations, some sample locations were changed and the total number of samples reduced (from 20 to 13) from what was presented in the Plan for Technology Demo - Deoiling of Lackawanna SWMU-1 Sludge, that was sent to you as an attachment to a letter dated April 7, 2000.

The results indicate that the PCB concentration in the solids for all the samples were below the laboratory reporting limit for the method of analysis used. The results of the Toxicity Characteristic Procedures analysis in all samples indicate that no sample exceeds the regulatory concentrations.

If you have any questions please call me at (610) 694-4240.

Very truly yours,

Ana Maria Ca

Ana Maria Caram
Sr. Environmental Engineer

Attachment

cc: Mr. Stanley Radon - NYSDEC

bcc: W. J. Riley - (w/o attachment)
D. E. Tomlinson - (w/o attachment)
L. T. Kaercher - (w/o attachment)
N. B. Franco - (w/o attachment)

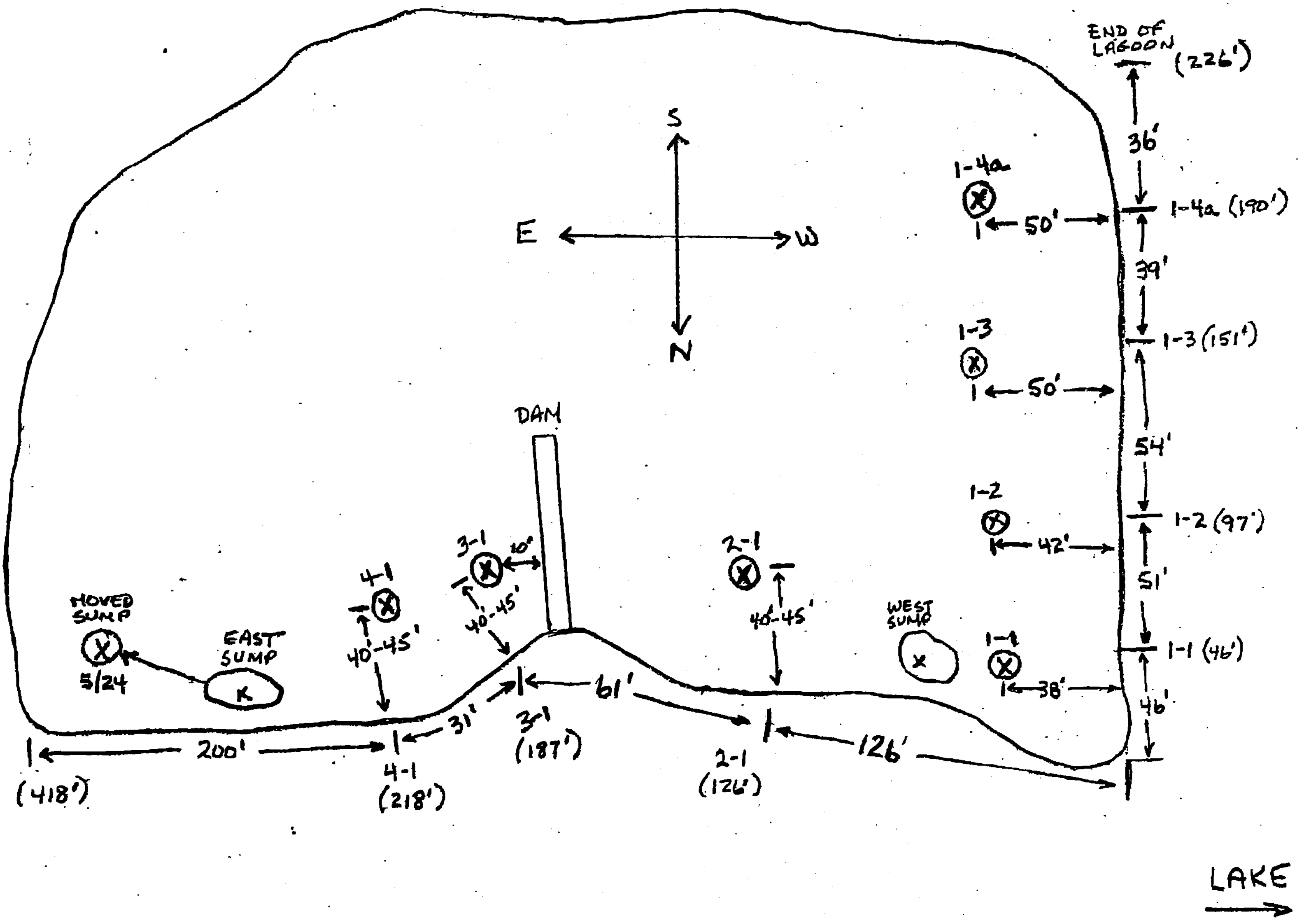
Jim,

Attached:

- Original sludge sampling plan – With Maxim's auger drill rig, we were able to take samples, safely, only at locations 5-4, 5-5, 4-4, 3-3, 2-4, and 1-4; actually 1-4 was taken much closer to 2-4 than indicated, due to unstable sludge conditions at the southwest corner.
- Sampling grid for additional locations that could be safely reached with Maxim's Geoprobe rig; 1-4a, 1-3, 1-2, 1-1, 2-1, 3-1, and 4-1.
- Lab reports for all 13 samples
    - In summary, PCB results for all samples < 2ppm; all pHs, flash points, CN and S reactivities OK; TCLP metals, VOCs and SVOCs for all samples below maximum concentration for toxicity characteristic.

Nick Franco
6/12/00

S-1 GEOPROBE SAMPLING
5/22 → 5/23/00



Chemical Analysis Report

Bethlehem Steel Corporation
Homer Research Laboratories
Analytical Chemistry & Laboratory Services
1170 Eighth Avenue
Bethlehem, PA 18016

Requester: N. B. Franco, T.H. Weidner

Copies to: Glenn Keyser

Sample Description:
Source: Lackawanna Plant, S-1 Impoundment
Process: General Plant Operations
Type: Oily Mill Scale

Purpose of Request: Moisture/O&G, Fe Analysis

Report by: Eileen M. Adams
Signature: EMAdams
Title: Raw Materials/ Environmental Materials
Material Coordinator
Phone Number: (610) 694-3193
Date Reported: 06/30/00

Analysis Results
All results are given in weight (mass/mass) percent

Lab IDs	Sample Identification	%H2O	%O&G	Fe
473 RE	Sample 1-1 0' to 7'	44.8	10.5	39.6
474 RE	Sample 1-1 7' to 14'	39.3	10.8	43.5
475 RE	Sample 1-2 0' to 8'	44.1	8.5	42.7
476 RE	Sample 1-2 8' to 16'	40.2	8.8	43.3
477 RE	Sample 1-3 0' to 8'	43.4	13.7	40.9
478 RE	Sample 1-3 8' to 16'	33.5	11.1	47.8
479 RE	Sample 1-4a 0' to 10'	38.6	5.8	43.0
480 RE	Sample 1-4a 10' to 20'	21.2	6.1	45.6
481 RE	Sample 2-1 0' to 10'	44.0	7.5	42.5
482 RE	Sample 2-1 10' to 20'	32.2	7.9	32.7
483 RE	Sample 3-1 0' to 9.75'	32.5	11.2	48.2
484 RE	Sample 3-1 9.75' to 19.5'	26.1	14.0	54.9
485 RE	Sample 4-1 0' to 10'	38.5	21.3	51.2
486 RE	Sample 4-1 10' to 20'	32.6	10.3	46.3

Comments:
1) Moisture results reported on best effort basis.
2) Oil and Grease results are reported on a dry weight basis.
3) Iron results are reported on a dry, de-oiled basis.

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Test results relate only to the items tested.
Only signed reports are official.
Lab Serial No. 00121

Chemical Analysis Report

Methodology & Traceability

Methods used:	Analyte	Concentration Range	Estimated Uncertainty (95% confidence	Notebook#	Page#	Sample Numbers	Analyst	Date Analyzed
Best Effort - A portion of the sample is dried at 105 degrees C to a constant weight. Result determined gravimetrically.	% Moisture	NA	NA	216	66, 69	473 RE, 476 RE, 479 RE, 484 RE	EMA	5/31 - 6/7/00
						486 RE	EMA	5/31 - 6/8/00
						480 RE	EMA	5/31 - 6/12/00
						474-475 RE, 481-483 RE, 485 RE	EMA	5/31 - 6/12/00
						477 RE	EMA	5/31 - 6/13/00
						478 RE	EMA	5/31 - 6/14/00
RE-009 - Soxhlet Extraction using Hexane	% Oil & Grease	0.05 - 100.0%	0.003 - 5.88%	216	67	473-480 RE	EMA/LMM	6/5 - 6/15/00
					68, 71	481-482 RE	EMA/LMM	6/8 - 6/15/00
					68, 71	483-484 RE	EMA/LMM	6/8 - 6/19/00
					68, 71	485-486 RE	EMA/LMM	6/8 - 6/20/00
RE-012 - Stannous Chloride Reduction and Dichromate Titration	% Total Iron	25 - 70%	0.16%	220	59	473-480 RE	EMA	6/12 - 6/13/00
					60	481-482 RE	EMA	6/12 - 6/13/00
					64	483-486 RE	LMM	6/19/00

Chemical Analysis Report

Quality Control

All results are given in weight (mass/mass) percent

Quality Control for sample 473-486 RE:

RE-009 SPC O/G Recovery	Actual %	Acceptance Criteria
EMA 6/5/00	100.59	97.05-103.29%
EMA 6/8/00	102.36	97.05-103.29%

RE-009 Lab Duplicate O/G Recovery	RPD %	
480 RE	1.48%	See Note 1

RE-012 SPC Total Fe Recovery	Actual %	Acceptance Criteria
6/12/00	65.77	65.72-66.18%
6/13/00	65.82	65.72-66.18%
6/19/00	65.99	65.72-66.18%

RE-012 Lab Duplicate Total Fe Recovery	RPD %	
480 RE	4.26%	See Note 2

Notes:

1) Sample 480 RE passes the Replicate Testing Program requirements for oil and grease analysis.
2) Sample 480 RE fails the Replicate Testing Program requirements for iron analysis. It is possible that the sample was not adequately mixed in the original jar prior to transferring the two separate aliquots for duplicate analysis.

Definitions:

NA - Not Applicable / Not Available
O/G - Oil and Grease
RPD - Relative Percent Difference
SPC - Statistical Process Control
EMA - Eileen M. Adams
LMM - Linda M. Matyas

Lab Serial No. **00121**

Chemical Analysis Request

Bethlehem Steel Corporation
Homer Research Laboratories
Analytical Chemistry & Laboratory Services
1170 Eighth Avenue
Bethlehem, PA 18016

Rev. 10/13/98

Analytes with Approximate Concentration (if available)

Total Number of Samples: 14

Lab IDs	**Sample Identification**	%H2O	%O&G	Fe									
473 RE	Sample 1-1 0' to 7'												
474 RE	Sample 1-1 7' to 14'												
475 RE	Sample 1-2 0' to 8'												
476 RE	Sample 1-2 8' to 16'												
477 RE	Sample 1-3 0' to 8'												
478 RE	Sample 1-3 8' to 16'												
479 RE	Sample 1-4a 0' to 10'												
480 RE	Sample 1-4a 10' to 20'												
481 RE	Sample 2-1 0' to 10'												
482 RE	Sample 2-1 10' to 20'												
483 RE	Sample 3-1 0' to 9.75'												
484 RE	Sample 3-1 9.75' to 19.5'												
485 RE	Sample 4-1 0' to 10'												
486 RE	Sample 4-1 10' to 20'												

Chemical Analysis Report cc list:

Name Glenn Keyser
Address Homer Research, Bldg. C-3, Rm. 184
Bethlehem, Pa. 18016

Fax# 2981
Lan ID
Email

Name
Address

Fax#
Lan ID
Email

Name
Address

Fax#
Lan ID
Email

Client File Name: Lackawanna
Lab Serial No. 00121

Chemical Analysis Request

Bethlehem Steel Corporation
Homer Research Laboratories
Analytical Chemistry & Laboratory Services
1170 Eighth Avenue
Bethlehem, PA 18016

Rev. 10/13/98

Analytes with Approximate Concentration (if available)

Total Number of Samples: 12

Lab IDs	Sample Identification	%H2O	%O&G	%Fe(T)									
418 RE	Sample 1-4 Surface to 6.5'												
419 RE	Sample 1-4 6.5' to 13'												
420 RE	Sample 2-4 Surface to 9.75'												
421 RE	Sample 2-4 9.75' to 19.5'												
422 RE	Sample 3-3 0' to 10'												
423 RE	Sample 3-3 10' to 20'												
424 RE	Sample 4-4 0' to 10'												
425 RE	Sample 4-4 10' to 20'												
426 RE	Sample 5-4 Surface to 8.5'												
427 RE	Sample 5-4 8.5' to 17'												
428 RE	Sample 5-5 Surface to 10'												
429 RE	Sample 5-5 10' to 20'												

Chemical Analysis Report cc list:

Name Glenn Keyser
Address Homer Research, Bldg. C-3, Rm. 184
Bethlehem, Pa. 18016

Fax# 2981
Lan ID
Email

Name
Address

Fax#
Lan ID
Email

Name
Address

Fax#
Lan ID
Email

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Client File Name: Lackawanna
Lab Serial No. 00105

Gascoyne Laboratories, Inc.
Baltimore, MD 21224
(410) 633-1800
FAX NO.
(410) 633-5443
www.gascoyne.com

REPORT OF ANALYSIS

Page 1 of 7
Report No: 0002608

Bethlehem Steel Corp.
1170 8th Ave.
Bethlehem, PA 18016

Attn: Nick Franco

This report of analysis contains test results for the following samples submitted to Gascoyne Laboratories, Inc. for project BSC-S1:

Client Sample I.D.,	Sample Type	Lab Sample No.	Received by Gascoyne
4-4(5-11-00); comp, 11-May-2000(1120)	Sludge	000008971	12-May-2000
3-3(5-11-00); comp, 11-May-2000(1535)	Sludge	000008972	12-May-2000

This Report contains the following:

A) Cover Letter
B) Test Results
C) Chain-of-Custody

All samples were analyzed following EPA protocols and other recognized methodologies as specified in the report. All laboratory Quality Control(QC) data associated with this report are within established control limits unless otherwise noted in this report.

Gascoyne Laboratories, Inc. laboratory identification numbers:

Maryland :109; Delaware: MD015; Virginia: 00152; New Jersey: 60637; Pennsylvania: 68-339; New York: 11158; A2LA: 410.01; AIHA:100491; US Army Corps of Engineers; and EPA ICR: ICRMD003.

The analyses specified in this report may or may not be included in the scopes of the above listed certifications.

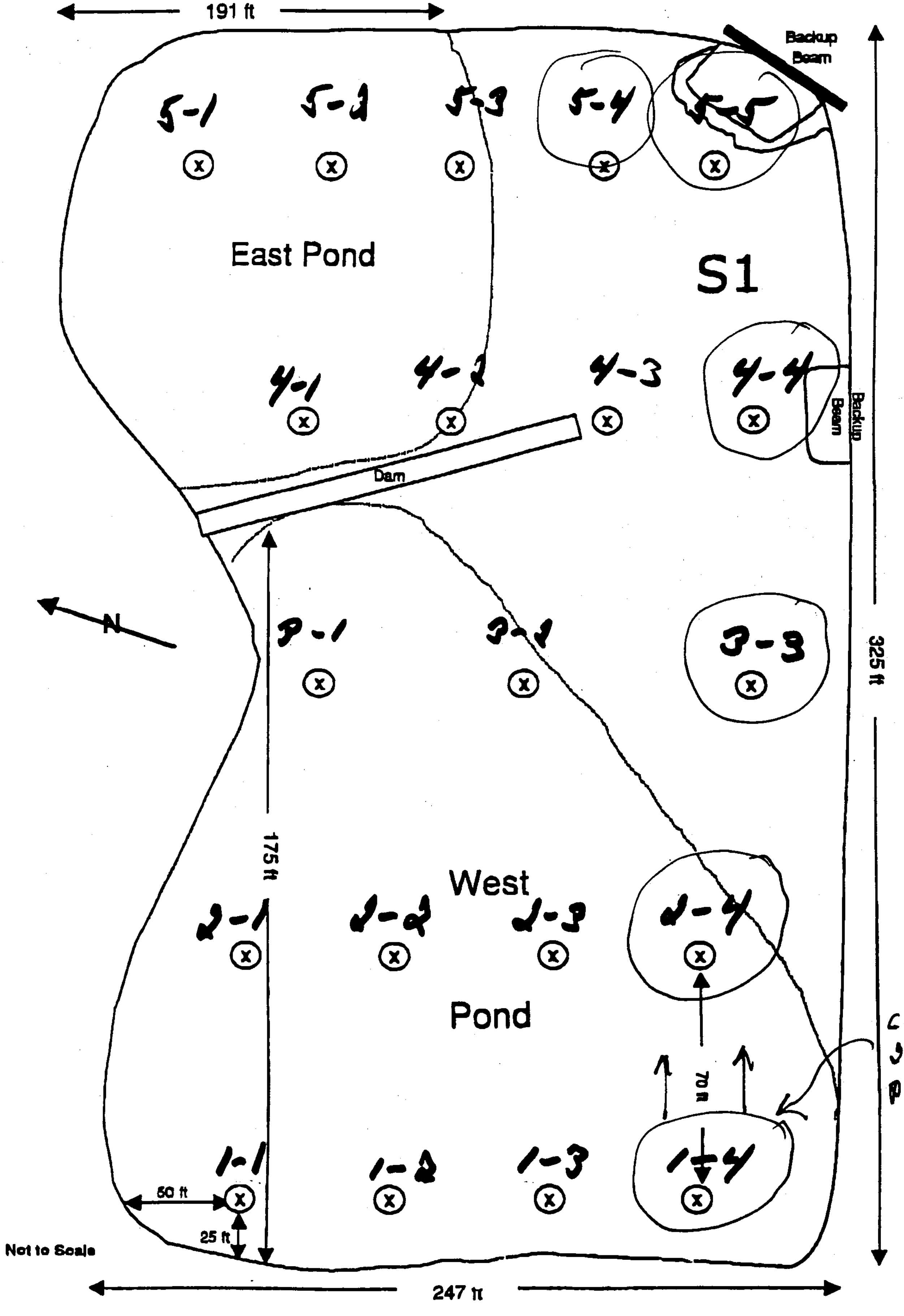
This cover page is an integral part of this report and must be included with all copies of this report.

James H Newman — 6/2/00

Final report reviewed by: James H. Newman, Client Services Manager — Report issue date

ORIGINAL

LACKAWANNA TECHNOLOGY DEMO
SWMU S-1 SAMPLING PLAN



Not to Scale

CLOSER TO 2-4 THAN PLANNED

Chemical Analysis Report

Bethlehem Steel Corporation
Homer Research Laboratories
Analytical Chemistry & Laboratory Services
1170 Eighth Avenue
Bethlehem, PA 18016

Requester: N. B. Franco, T.H. Weidner

Copies to: Glenn Keyser

Sample Description:
Source: Lackawanna Plant, S-1 Impoundment
Process: General Plant Operations
Type: Oily Mill Scale

Purpose of Request: Moisture/Oil & Grease Analysis

Report by: Eileen M. Adams
Signature: EMAdams
Title: Raw Materials/ Environmental Materials Material Coordinator
Phone Number: (610) 694-3193
Date Reported: 06/07/00

Analysis Results
All results are given in weight (mass/mass) percent

Lab IDs	Sample Identification	%H2O	%O&G	%Fe(T)
418 RE	Sample 1-4 Surface to 6.5'	14.5	10.3	65.6
419 RE	Sample 1-4 6.5' to 13'	12.9	9.3	64.5
420 RE	Sample 2-4 Surface to 9.75'	11.2	11.5	67.8
421 RE	Sample 2-4 9.75' to 19.5'	11.4	10.9	65.4
422 RE	Sample 3-3 0' to 10'	11.9	10.3	64.1
423 RE	Sample 3-3 10' to 20'	16.1	7.5	64.9
424 RE	Sample 4-4 0' to 10'	15.1	9.8	62.8
425 RE	Sample 4-4 10' to 20'	17.8	8.8	61.5
426 RE	Sample 5-4 Surface to 8.5'	18.9	10.6	64.5
427 RE	Sample 5-4 8.5' to 17'	26.1	7.9	56.8
428 RE	Sample 5-5 Surface to 10'	17.7	9.7	64.7
429 RE	Sample 5-5 10' to 20'	19.5	7.6	53.1

Comments:
1) Moisture results reported on best effort basis.
2) Oil and Grease Results are reported on a dry weight basis.
3) Iron results are reported on a dry, de-oiled basis.

Test results relate only to the items tested.
Only signed reports are official.
Lab Serial No. **00105**

Chemical Analysis Report

Methodology & Traceability

Methods used:	Analyte	Concentration Range	Estimated Uncertainty (95% confidence	Notebook#	Page#	Sample Numbers	Analyst	Date Analyzed
Best Effort - A portion of the sample is dried at 105 degrees C to a constant weight. Result determined gravimetrically.	% Moisture	NA	NA	216	62, 65	418 RE, 428 RE	EMA/LMM	5/17 - 5/22/00
						419-422 RE, 424-427 RE, 429 RE	EMA/LMM	5/17 - 5/23/00
						423 RE	EMA/LMM	5/17 - 5/25/00
RE-009 - Soxhlet Extraction using Hexane	% Oil & Grease	0.05 - 100.0%	0.003 - 5.88%	216	63	418-422 RE	EMA/LMM	5/18 - 5/23/00
					64	423-429 RE	EMA/LMM	5/22 - 5/31/00
RE-012 - Stannous Chloride Reduction and Dichromate Titration	% Total Iron	25 - 70%	0.16%	220	55	418-428 RE	EMA	5/25 - 6/2/00
					57	429 RE	EMA	6/5 - 6/6/00

Chemical Analysis Report

Quality Control

All results are given in weight (mass/mass) percent

Quality Control for sample 418-429 RE:

RE-009 SPC O/G Recovery	Actual %	Acceptance Criteria
LMM 5/18/00	97.18	97.05-103.29%
LMM 5/22/00	100.21	97.05-103.29%
EMA 5/18/00	99.43	97.05-103.29%
EMA 5/22/00	101.32	97.05-103.29%
RE-009 Lab Duplicate O/G Recovery	RPD %	
420 RE	0.61%	See Note 1

RE-012 SPC Total Fe Recovery	Actual %	Acceptance Criteria
6/2/00	66.07	65.72-66.18%
6/6/00	65.85	65.72-66.18%
RE-012 Lab Duplicate Total Fe Recovery	RPD %	
420 RE	1.23%	See Note 1

Notes:

1) Sample 420 RE passes the Replicate Testing Program requirements.

Definitions:

NA - Not Applicable / Not Available
O/G - Oil and Grease
RPD - Relative Percent Difference
EMA - Eileen M. Adams
LMM - Linda M. Matyas

Chemical Analysis Request

Bethlehem Steel Corporation
Homer Research Laboratories
Analytical Chemistry & Laboratory Services
1170 Eighth Avenue
Bethlehem, PA 18016

Rev. 10/13/98

Sample Description: Source: Lackawanna Plant, S-1 Impoundment
Process: General Plant Operations
Type: Oily Mill Scale

Purpose of Request: Moisture/Oil & Grease Analysis

Requester: Name N. B. Franco, T.H. Weidner
Address Bethlehem Steel Corp.
Environmental Affairs, 12th Flr. Martin Tower
Bethlehem, Pa. 18016

Phone # 694-3019, 694-6802
Fax # 4756
Lan ID
E-Mail

Sampler(s): Name(s) Maxim Technologies, Inc.

Address Hamburg, N.Y.

Phone # 716-649-8110 (office-Jeff Contino)

Special Instructions: Routine moisture and O&G analysis.

Key to Sample Identifications: There will be two sample bottles for each core sample. Each will be marked with a location (Ex.1-4), and depth (sampler used S for surface or 0' for first sample from each core drilling).

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Material Category: Raw Materials/ Environmental Materials

Sampling Procedure: Core Drilling Rig/Split Spoon Sampler

Submitter: Name Glenn Keyser
Address Homer Research, Bldg. C-3, Rm. 184
Bethlehem, Pa. 18016

Phone # 694-2861
Fax # 2981
Lan ID
E-Mail

Date Transmitted: 05/16/00

Client File Name: Lackawanna S-1 Oily Sludge

Mode of Transport: Hand Carry

------ *Laboratory Use Only* ------

Date Received: 05/17/00

Time Received: 07:00 AM

Sample Condition: Samples are black and reddish oily sludges in 250 ml glass I-Chem jars.

Review and Affirm: ema

Lab Serial No. 00105

Report no: **0002608**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 4-4(5-11-00); comp collected on 11-May-00(11:20)**
Laboratory Sample Number: 000008971

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	<1 ppm-dwb	1 ppm-dwb	EPA-8082	MST	23-May-00(14:11)
Decachlorobiphenyl(surrogate)	89 % Rec	NA	EPA-8082	MST	23-May-00(14:11)
Tetrachloro-m-xylene(surrogate)	78 % Rec	NA	EPA-8082	MST	23-May-00(14:11)
Total Cresols	0.33 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(18:08)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(18:08)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(18:08)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(18:08)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(18:08)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(18:08)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	30-May-00(18:08)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(18:08)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(18:08)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	30-May-00(18:08)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(18:08)
2-Fluorophenol(surrogate)	49 % Rec	NA	EPA-8270C	MYD	30-May-00(18:08)
Phenol-d5(surrogate)	39 % Rec	NA	EPA-8270C	MYD	30-May-00(18:08)
Nitrobenzene-d5(surrogate)	84 % Rec	NA	EPA-8270C	MYD	30-May-00(18:08)
2-Fluorobiphenyl(surrogate)	79 % Rec	NA	EPA-8270C	MYD	30-May-00(18:08)
2,4,6-Tribromophenol(surrogate)	79 % Rec	NA	EPA-8270C	MYD	30-May-00(18:08)
Terphenyl-d14(surrogate)	75 % Rec	NA	EPA-8270C	MYD	30-May-00(18:08)
Benzene	0.038 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:28)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:28)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:28)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:28)

REPORT OF ANALYSIS

Report no: **0002608**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 4-4(5-11-00); comp collected on 11-May-00(11:20)**
Laboratory Sample Number: 000008971

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:28)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:28)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	25-May-00(03:28)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:28)
Trichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:28)
Vinyl Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	25-May-00(03:28)
Dibromofluoromethane(surrogate)	85 % Rec	NA	EPA-8260B	THP	25-May-00(03:28)
1,2-Dichloroethane-d4(surrogate)	95 % Rec	NA	EPA-8260B	THP	25-May-00(03:28)
Toluene-d8(surrogate)	86 % Rec	NA	EPA-8260B	THP	25-May-00(03:28)
Bromofluorobenzene(surrogate)	98 % Rec	NA	EPA-8260B	THP	25-May-00(03:28)
Sample/Test Notes: Sample received with headspace.					
Flashpoint	>200 °F	NA	EPA-1020A	JAW	19-May-00(10:00)
Residue at 105°C	83.4 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	15-May-00(13:39)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	17-May-00(17:07)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	17-May-00(16:47)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	17-May-00(16:47)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	17-May-00(16:47)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	17-May-00(16:47)

Report no: **0002608**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 4-4(5-11-00); comp collected on 11-May-00(11:20)**
Laboratory Sample Number: 000008971

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	17-May-00(16:47)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	17-May-00(16:47)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	17-May-00(16:47)
pH	9.8 pH units	NA	EPA-9045C	VAS	17-May-00(12:17)
Temperature at analysis	22.5 °C	NA	EPA-9045C	VAS	17-May-00(12:17)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	18-May-00(14:55)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	19-May-00(07:10)

Report no: **0002608**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 3-3(5-11-00); comp collected on 11-May-00(15:35)**
Laboratory Sample Number: 000008972

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	<1 ppm-dwb	1 ppm-dwb	EPA-8082	MST	23-May-00(14:43)
Decachlorobiphenyl(surrogate)	83 % Rec	NA	EPA-8082	MST	23-May-00(14:43)
Tetrachloro-m-xylene(surrogate)	77 % Rec	NA	EPA-8082	MST	23-May-00(14:43)
Total Cresols	0.21 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(19:28)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(19:28)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(19:28)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(19:28)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(19:28)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(19:28)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	30-May-00(19:28)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(19:28)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(19:28)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	30-May-00(19:28)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	30-May-00(19:28)
2-Fluorophenol(surrogate)	48 % Rec	NA	EPA-8270C	MYD	30-May-00(19:28)
Phenol-d5(surrogate)	39 % Rec	NA	EPA-8270C	MYD	30-May-00(19:28)
Nitrobenzene-d5(surrogate)	85 % Rec	NA	EPA-8270C	MYD	30-May-00(19:28)
2-Fluorobiphenyl(surrogate)	85 % Rec	NA	EPA-8270C	MYD	30-May-00(19:28)
2,4,6-Tribromophenol(surrogate)	82 % Rec	NA	EPA-8270C	MYD	30-May-00(19:28)
Terphenyl-d14(surrogate)	80 % Rec	NA	EPA-8270C	MYD	30-May-00(19:28)
Benzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:59)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:59)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:59)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:59)

Report no: **0002608**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 3-3(5-11-00); comp collected on 11-May-00(15:35)**
Laboratory Sample Number: 000008972

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:59)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:59)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	25-May-00(03:59)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:59)
Trichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(03:59)
l Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	25-May-00(03:59)
Dibromofluoromethane(surrogate)	85 % Rec	NA	EPA-8260B	THP	25-May-00(03:59)
1,2-Dichloroethane-d4(surrogate)	97 % Rec	NA	EPA-8260B	THP	25-May-00(03:59)
Toluene-d8(surrogate)	85 % Rec	NA	EPA-8260B	THP	25-May-00(03:59)
Bromofluorobenzene(surrogate)	97 % Rec	NA	EPA-8260B	THP	25-May-00(03:59)
Flashpoint	>200 °F	NA	EPA-1020A	JAW	19-May-00(10:00)
Residue at 105°C	91.0 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	15-May-00(13:39)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	17-May-00(17:13)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	17-May-00(16:58)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	17-May-00(16:58)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	17-May-00(16:58)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	17-May-00(16:58)

Report no: **0002608**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 3-3(5-11-00); comp collected on 11-May-00(15:35)**
Laboratory Sample Number: 000008972

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	17-May-00(16:58)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	17-May-00(16:58)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	17-May-00(16:58)
pH	9.1 pH units	NA	EPA-9045C	VAS	17-May-00(12:18)
Temperature at analysis	22.8 °C	NA	EPA-9045C	VAS	17-May-00(12:18)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	18-May-00(14:55)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	19-May-00(07:10)

Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

TCLP

Toxicity Characteristic Leaching Procedure

METALS	Regulatory limits mg/L
Arsenic (As)	5.0
Barium (Ba)	100.0
Cadmium (Cd)	1.0
Chromium (Cr)	5.0
Lead (Pb)	5.0
Mercury (Hg)	0.2
Selenium (Se)	1.0
Silver (Ag)	5.0

HERBICIDES/ PESTICIDES	Regulatory limits mg/L
2,4-D	10.0
2,4,5-TP (Silvex)	1.0
Chlordane	0.03
Endrin	0.02
Heptachlor and Epoxide	0.008
Lindane	0.4
Methoxychlor	10.0
Toxaphene	0.5

SEMI-VOLATILES	Regulatory limits mg/L
Total Cresols (ortho, para & meta)	200.0
2,4-Dinitrotoluene	0.13
Hexachloro-1,3-butadiene	0.5
Hexachlorobenzene	0.13
Hexachloroethane	3.0
Nitrobenzene	2.0
Pentachlorophenol	100.0
2,4,5-Trichlorophenol	400.0
2,4,6-Trichlorophenol	2.0
Pyridine	5.0
1,4-Dichlorobenzene	7.5

VOLATILES	Regulatory limits mg/L
Benzene	0.50
Carbon Tetrachloride	0.50
Chlorobenzene	100.0
Chloroform	6.0
1,2-Dichloroethene	0.50
1,1-Dichloroethene	0.70
Methyl Ethyl Ketone	200.0
Tetrachloroethene	0.7
Trichloroethene	0.5
Vinyl Chloride	0.20

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Please see reverse side for explanation of terms and other information.

SAMPLE SUBMITTAL — CHAIN-OF-CUSTODY

Page 1 of 1

SAMPLE TYPE CODES

Field Blank	FB	Sludge	SL	Drinking Water	DW
Soil	SO	Trip Blank	TB	Ground Water	GW
Oil(s)	OL	Waste- Liquid	L	Surface Water	SW
Paint Chips	PC	- Solid	S	Waste Water	WW
Wipes	WP				

GASCOYNE LABORATORIES, INC.

2101 Van Deman Street • Baltimore, MD 21224
410-633-1800 • FAX: 410-633-5443

LAB USE ONLY

Report # CC091008
Temp. Blk.
Cooler #
PUC #

Test Results to:

Company: Bethlehem Steel Corp
Contact: Nick Franco
Phone No. 610/694-3019
FAX No. 610/694-1524

Sample Site/Project BSC-S1
Sampler/MDOE # Maxim Tech
Gascoyne Quote #
Client's P.O. #

RESULTS NEEDED BY: ☐ ROUTINE ☐ PRIORITY* BY: ______ TIME ______ DAY ______ DATE

TESTS REQUIRED

LIMS NO. LAB USE ONLY	SAMPLE TYPE USE CODES ABOVE if applicable	SAMPLE IDENTIFICATION (Keep brief - 14 Characters Max)	DATE COL-LECTED	TIME COL-LECTED	COMPOSITE	GRAB	NUMBER OF CON-TAINERS	125mL VOA Vial	500mL Glass	COMMENTS (i.e. Data Package, methods, detection limits, etc.)
[illegible]	SL	4-4 (5-11-00)	5/11/00	1120	X		4	XXX	X	
[illegible]	SL	3-3 (5-11-00)	11	1535	X		4	XXX	X	

Total Number of Containers 8

Data Package Required ☐ 1 ☐ 2 ☐ 3

Relinquished By (signature):	Printed Name/Affiliation:	Date: / Time:	Received By (signature):	Printed Name/Affiliation:	Date: / Time:
	Anthony J [illegible] / BSC Cons.	5/11/00 1535	Jeff Contino	Jeff Contino / BSC Cons.	Same
Jeff Contino	Jeff Contino / BSC Cons.	5/11/00 1713	FED EX (MBE)		
FED EX				[illegible]	[illegible] [illegible]

* May Requ[illegible] urcharge

Gascoyne Laboratories, Inc.

Baltimore, MD 21224

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REPORT OF ANALYSIS

Report No: 0002680

Bethlehem Steel Corp.
1170 8th Ave.
Bethlehem, PA 18016

Attn: Nick Franco

This report of analysis contains test results for the following samples submitted to Gascoyne Laboratories, Inc. for project BSC-SI:

Client Sample I.D.,	Sample Type	Lab Sample No.	Received by Gascoyne
5-4(5/12/00); comp, 12-May-2000(1450)	Sludge	000009141	16-May-2000
1-4(5/12/00); comp, 12-May-2000(1335)	Sludge	000009142	16-May-2000
2-4(5/12/00); comp, 12-May-2000(1115)	Sludge	000009143	16-May-2000
5-5(5/12/00); comp, 12-May-2000(0905)	Sludge	000009144	16-May-2000

This Report contains the following:

A) Cover Letter
B) Test Results
C) Chain-of-Custody

All samples were analyzed following EPA protocols and other recognized methodologies as specified in the report. All laboratory Quality Control(QC) data associated with this report are within established control limits unless otherwise noted in this report.

Gascoyne Laboratories, Inc. laboratory identification numbers:

Maryland :109; Delaware: MD015; Virginia: 00152; New Jersey: 60637; Pennsylvania: 68-339;
New York: 11158; A2LA: 410.01; AIHA:100491; US Army Corps of Engineers;
and EPA ICR: ICRMD003.

The analyses specified in this report may or may not be included in the scopes of the above listed certifications.

This cover page is an integral part of this report and must be included with all copies of this report.

James H Newman 6/2/00

Final report reviewed by: James H. Newman, Client Services Manager Report issue date

Report no: **0002680**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 5-4(5/12/00); comp collected on 12-May-00(14:50)**
Laboratory Sample Number: 000009141

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	<1 ppm-dwb	1 ppm-dwb	EPA-8082	MST	23-May-00(15:49)
Decachlorobiphenyl(surrogate)	94 % Rec	NA	EPA-8082	MST	23-May-00(15:49)
Tetrachloro-m-xylene(surrogate)	93 % Rec	NA	EPA-8082	MST	23-May-00(15:49)
Total Cresols	0.34 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(11:18)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(11:18)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(11:18)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(11:18)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(11:18)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(11:18)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	31-May-00(11:18)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(11:18)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(11:18)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	31-May-00(11:18)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(11:18)
2-Fluorophenol(surrogate)	58 % Rec	NA	EPA-8270C	MYD	31-May-00(11:18)
Phenol-d5(surrogate)	51 % Rec	NA	EPA-8270C	MYD	31-May-00(11:18)
Nitrobenzene-d5(surrogate)	79 % Rec	NA	EPA-8270C	MYD	31-May-00(11:18)
2-Fluorobiphenyl(surrogate)	73 % Rec	NA	EPA-8270C	MYD	31-May-00(11:18)
2,4,6-Tribromophenol(surrogate)	77 % Rec	NA	EPA-8270C	MYD	31-May-00(11:18)
Terphenyl-d14(surrogate)	79 % Rec	NA	EPA-8270C	MYD	31-May-00(11:18)
Benzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:24)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:24)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:24)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:24)

REPORT OF ANALYSIS

Report no: **0002680**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 5-4(5/12/00); comp collected on 12-May-00(14:50)**
Laboratory Sample Number: 000009141

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:24)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:24)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	25-May-00(01:24)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:24)
Trichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:24)
l Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	25-May-00(01:24)
Dibromofluoromethane(surrogate)	87 % Rec	NA	EPA-8260B	THP	25-May-00(01:24)
1,2-Dichloroethane-d4(surrogate)	96 % Rec	NA	EPA-8260B	THP	25-May-00(01:24)
Toluene-d8(surrogate)	86 % Rec	NA	EPA-8260B	THP	25-May-00(01:24)
Bromofluorobenzene(surrogate)	97 % Rec	NA	EPA-8260B	THP	25-May-00(01:24)

Sample/Test Notes:
Sample received with headspace.

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
Flashpoint	>200 °F	NA	EPA-1020A	JAW	25-May-00(17:30)
Residue at 105°C	76.8 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	19-May-00(16:07)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	26-May-00(16:38)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:22)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	26-May-00(14:22)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	26-May-00(14:22)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	26-May-00(14:22)

REPORT OF ANALYSIS

Report no: **0002680**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 5-4(5/12/00); comp collected on 12-May-00(14:50)**
Laboratory Sample Number: 000009141

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:22)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:22)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	26-May-00(14:22)
pH	10.2 pH units	NA	EPA-9045C	VAS	17-May-00(12:09)
Temperature at analysis	21.7 °C	NA	EPA-9045C	VAS	17-May-00(12:09)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	18-May-00(14:55)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	19-May-00(07:10)

Report no: **0002680**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 1-4(5/12/00); comp collected on 12-May-00(13:35)**
Laboratory Sample Number: 000009142

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	1 ppm-dwb	1 ppm-dwb	EPA-8082	MST	23-May-00(16:21)
Decachlorobiphenyl(surrogate)	88 % Rec	NA	EPA-8082	MST	23-May-00(16:21)
Tetrachloro-m-xylene(surrogate)	79 % Rec	NA	EPA-8082	MST	23-May-00(16:21)
Total Cresols	**0.16 mg/l TC**	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(12:39)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(12:39)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(12:39)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(12:39)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(12:39)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(12:39)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	31-May-00(12:39)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(12:39)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(12:39)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	31-May-00(12:39)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(12:39)
2-Fluorophenol(surrogate)	55 % Rec	NA	EPA-8270C	MYD	31-May-00(12:39)
Phenol-d5(surrogate)	53 % Rec	NA	EPA-8270C	MYD	31-May-00(12:39)
Nitrobenzene-d5(surrogate)	78 % Rec	NA	EPA-8270C	MYD	31-May-00(12:39)
2-Fluorobiphenyl(surrogate)	72 % Rec	NA	EPA-8270C	MYD	31-May-00(12:39)
2,4,6-Tribromophenol(surrogate)	75 % Rec	NA	EPA-8270C	MYD	31-May-00(12:39)
Terphenyl-d14(surrogate)	79 % Rec	NA	EPA-8270C	MYD	31-May-00(12:39)
Benzene	**0.036 mg/l TC**	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:55)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:55)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:55)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:55)

REPORT OF ANALYSIS

Report no: **0002680**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 1-4(5/12/00); comp collected on 12-May-00(13:35)**
Laboratory Sample Number: 000009142

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:55)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:55)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	25-May-00(01:55)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:55)
Trichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(01:55)
Vinyl Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	25-May-00(01:55)
Dibromofluoromethane(surrogate)	88 % Rec	NA	EPA-8260B	THP	25-May-00(01:55)
1,2-Dichloroethane-d4(surrogate)	96 % Rec	NA	EPA-8260B	THP	25-May-00(01:55)
Toluene-d8(surrogate)	87 % Rec	NA	EPA-8260B	THP	25-May-00(01:55)
Bromofluorobenzene(surrogate)	97 % Rec	NA	EPA-8260B	THP	25-May-00(01:55)
Flashpoint	>200 °F	NA	EPA-1020A	JAW	25-May-00(17:30)
Residue at 105°C	84.7 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	19-May-00(16:07)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	26-May-00(16:44)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:41)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	26-May-00(14:41)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	26-May-00(14:41)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	26-May-00(14:41)

Report no: **0002680**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 1-4(5/12/00); comp collected on 12-May-00(13:35)**
Laboratory Sample Number: 000009142

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:41)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:41)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	26-May-00(14:41)
pH	9.4 pH units	NA	EPA-9045C	VAS	17-May-00(12:11)
Temperature at analysis	22.4 °C	NA	EPA-9045C	VAS	17-May-00(12:11)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	18-May-00(14:55)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	19-May-00(07:10)

Report no: **0002680**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 2-4(5/12/00); comp collected on 12-May-00(11:15)**
Laboratory Sample Number: 000009143

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	<1 ppm-dwb	1 ppm-dwb	EPA-8082	MST	23-May-00(16:54)
Decachlorobiphenyl(surrogate)	88 % Rec	NA	EPA-8082	MST	23-May-00(16:54)
Tetrachloro-m-xylene(surrogate)	79 % Rec	NA	EPA-8082	MST	23-May-00(16:54)
Total Cresols	0.28 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(13:19)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(13:19)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(13:19)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(13:19)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(13:19)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(13:19)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	31-May-00(13:19)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(13:19)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(13:19)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	31-May-00(13:19)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	31-May-00(13:19)
2-Fluorophenol(surrogate)	40 % Rec	NA	EPA-8270C	MYD	31-May-00(13:19)
Phenol-d5(surrogate)	30 % Rec	NA	EPA-8270C	MYD	31-May-00(13:19)
Nitrobenzene-d5(surrogate)	71 % Rec	NA	EPA-8270C	MYD	31-May-00(13:19)
2-Fluorobiphenyl(surrogate)	68 % Rec	NA	EPA-8270C	MYD	31-May-00(13:19)
2,4,6-Tribromophenol(surrogate)	68 % Rec	NA	EPA-8270C	MYD	31-May-00(13:19)
Terphenyl-d14(surrogate)	71 % Rec	NA	EPA-8270C	MYD	31-May-00(13:19)
Benzene	0.044 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:26)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:26)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:26)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:26)

Report no: **0002680**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 2-4(5/12/00); comp collected on 12-May-00(11:15)**
Laboratory Sample Number: 000009143

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:26)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:26)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	25-May-00(02:26)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:26)
Trichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:26)
l Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	25-May-00(02:26)
Dibromofluoromethane(surrogate)	86 % Rec	NA	EPA-8260B	THP	25-May-00(02:26)
1,2-Dichloroethane-d4(surrogate)	96 % Rec	NA	EPA-8260B	THP	25-May-00(02:26)
Toluene-d8(surrogate)	85 % Rec	NA	EPA-8260B	THP	25-May-00(02:26)
Bromofluorobenzene(surrogate)	104 % Rec	NA	EPA-8260B	THP	25-May-00(02:26)
Flashpoint	>200 °F	NA	EPA-1020A	JAW	25-May-00(17:30)
Residue at 105°C	89.1 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	19-May-00(16:07)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	26-May-00(16:46)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:44)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	26-May-00(14:44)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	26-May-00(14:44)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	26-May-00(14:44)

Report no: **0002680**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 2-4(5/12/00); comp collected on 12-May-00(11:15)**
Laboratory Sample Number: 000009143

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:44)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:44)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	26-May-00(14:44)
pH	10.1 pH units	NA	EPA-9045C	VAS	17-May-00(12:13)
Temperature at analysis	23.0 °C	NA	EPA-9045C	VAS	17-May-00(12:13)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	18-May-00(14:55)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	19-May-00(07:10)

Report no: **0002680**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 5-5(5/12/00); comp collected on 12-May-00(09:05)**
Laboratory Sample Number: 000009144

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	**0.031 mg/l TC**	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:57)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:57)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	25-May-00(02:57)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:57)
Trichloroethene	**0.14 mg/l TC**	0.025 mg/l TC	EPA-8260B	THP	25-May-00(02:57)
Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	25-May-00(02:57)
Dibromofluoromethane(surrogate)	85 % Rec	NA	EPA-8260B	THP	25-May-00(02:57)
1,2-Dichloroethane-d4(surrogate)	92 % Rec	NA	EPA-8260B	THP	25-May-00(02:57)
Toluene-d8(surrogate)	86 % Rec	NA	EPA-8260B	THP	25-May-00(02:57)
Bromofluorobenzene(surrogate)	98 % Rec	NA	EPA-8260B	THP	25-May-00(02:57)
Flashpoint	>200 °F	NA	EPA-1020A	JAW	25-May-00(17:30)
Residue at 105°C	79.8 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	19-May-00(16:07)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	26-May-00(16:48)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:48)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	26-May-00(14:48)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	26-May-00(14:48)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	26-May-00(14:48)

REPORT OF ANALYSIS

Report no: **0002680**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 5-5(5/12/00); comp collected on 12-May-00(09:05)**
Laboratory Sample Number: 000009144

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:48)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	26-May-00(14:48)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	26-May-00(14:48)
pH	11.6 pH units	NA	EPA-9045C	VAS	17-May-00(12:14)
Temperature at analysis	22.5 °C	NA	EPA-9045C	VAS	17-May-00(12:14)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	18-May-00(14:55)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	19-May-00(07:10)

SAMPLE SUBMITTAL CHAIN-OF-CUSTODY

Page 1 of 1

GASCOYNE LABORATORIES, INC.

2101 Van Deman Street • Baltimore, MD 21224
410-633-1800 • FAX: 410-633-5443

SAMPLE TYPE CODES

Field Blank	FB	Sludge	SL	Drinking Water	DW		
Soil	SO	Trip Blank	TB	Ground Water	GW		
Oils	OL	Waste- Liquid	L	Surface Water	SW		
Paint Chips	PC	- Solid	S	Waste Water	WW		
Wipes	WP						

5/16/00

LAB USE ONLY

Report # 0002680
Temp. Blk.
Cooler #
PUC #

Test Results to:

Company: Bethlehem Steel Corp.
Contact: Nick Franco
Phone No. (610) 694-3019
FAX No. (610) 694-1524

Sample Site/Project BSC 31
Sampler/MDOE # Maxim Tech
Gascoyne Quote #
Client's P.O. #

RESULTS NEEDED BY: ☐ ROUTINE ☐ PRIORITY* BY: ____ TIME ____ DAY ____ DATE

TESTS REQUIRED

- TCLP VOC's / Reactivity / Corrosivity – 4 ounce VOA
- TCLP SVOC / TCLP Metals / TCLP PCB's – 16 ounce glass

LIMS NO. LAB USE ONLY	SAMPLE TYPE USE CODES ABOVE if applicable	SAMPLE IDENTIFICATION (Keep brief - 14 Characters Max)	DATE COL-LECTED	TIME COL-LECTED	COMPOSITE	GRAB	NUMBER OF CON-TAINERS	TESTS REQUIRED		COMMENTS (i.e. Data Package, methods, detection limits, etc.)
	SL	5-4(5/12/00)	5/12/00	1450	X		4	XXX	X	
	SL	1-4(5/12/00)		1335	X		4	XXX	X	
9111	SL	2-4(5/12/00)		1115	X		4	XXX	X	
9112	SL	5-5(5/12/00)		0905	X		4	XXX	X	
9111							16	total		

Total Number of Containers

Data Package Required ☐ 1 ☐ 2 ☐ 3

Relinquished By (signature):	Printed Name/Affiliation: Anthony J. Notaro / BSC Cons	Date: 05/12/00 Time: 1715	Received By (signature): MAX COOLER	Printed Name/Affiliation:	Date: 5/12/00 Time: 1715
Relinquished By (signature): Jeff Contino	Printed Name/Affiliation: Jeff Contino / BSC Consult	Date: 5/15/00 Time: 1520	Received By (signature): FED EX	Printed Name/Affiliation:	Date: Time:
Relinquished By (signature): FED EX	Printed Name/Affiliation:	Date: Time:	Received By (signature):	Printed Name/Affiliation: GLI	Date: 5/16/00 Time: 1010
Relinquished By (signature):	Printed Name/Affiliation:	Date: Time:	Received By (signature):	Printed Name/Affiliation:	Date: Time:

* May Require Surcharge

WHITE COPY - LAB YELLOW - REPORT COPY PINK - CLIENT SAMPLE SUBMITTAL RECEIPT

Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

Page 1 of 7
Report No: 0002830

Bethlehem Steel Corp.
1170 8th Ave.
Bethlehem, PA 18016

Attn: Nick Franco

This report of analysis contains test results for the following samples submitted to Gascoyne Laboratories, Inc. for project BSC - S1:

Client Sample I.D.,	Sample Type	Lab Sample No.	Received by Gascoyne
1-1 (5-22-00); comp, 22-May-2000(1445)	Sludge	000009920	23-May-2000
1-2 (5-22-00); comp, 22-May-2000(1320)	Sludge	000009921	23-May-2000

This Report contains the following:

A) Cover Letter
B) Test Results
C) Chain-of-Custody

All samples were analyzed following EPA protocols and other recognized methodologies as specified in the report. All laboratory Quality Control(QC) data associated with this report are within established control limits unless otherwise noted in this report.

Gascoyne Laboratories, Inc. laboratory identification numbers:

Maryland :109; Delaware: MD015; Virginia: 00152; New Jersey: 60637; Pennsylvania: 68-339; New York: 11158; A2LA: 410.01; AIHA:100491; US Army Corps of Engineers; and EPA ICR: ICRMD003.

The analyses specified in this report may or may not be included in the scopes of the above listed certifications.

This cover page is an integral part of this report and must be included with all copies of this report.

James H Newman 6/9/00

Final report reviewed by: James H. Newman, Client Services Manager Report issue date

Report no: **0002830**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 1-1 (5-22-00); comp collected on 22-May-00(14:45)**
Laboratory Sample Number: 000009920

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	<2 ppm-dwb	2 ppm-dwb	EPA-8082	MST	24-May-00(12:38)
Decachlorobiphenyl(surrogate)	90 % Rec	NA	EPA-8082	MST	24-May-00(12:38)
Tetrachloro-m-xylene(surrogate)	87 % Rec	NA	EPA-8082	MST	24-May-00(12:38)
Total Cresols	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(18:36)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(18:36)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(18:36)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(18:36)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(18:36)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(18:36)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	05-Jun-00(18:36)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(18:36)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(18:36)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	05-Jun-00(18:36)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(18:36)
2-Fluorophenol(surrogate)	39 % Rec	NA	EPA-8270C	MYD	05-Jun-00(18:36)
Phenol-d5(surrogate)	29 % Rec	NA	EPA-8270C	MYD	05-Jun-00(18:36)
Nitrobenzene-d5(surrogate)	67 % Rec	NA	EPA-8270C	MYD	05-Jun-00(18:36)
2-Fluorobiphenyl(surrogate)	60 % Rec	NA	EPA-8270C	MYD	05-Jun-00(18:36)
2,4,6-Tribromophenol(surrogate)	75 % Rec	NA	EPA-8270C	MYD	05-Jun-00(18:36)
Terphenyl-d14(surrogate)	77 % Rec	NA	EPA-8270C	MYD	05-Jun-00(18:36)
Benzene	0.058 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:16)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:16)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:16)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:16)

Gascoyne Laboratories, Inc.
Baltimore, MD 21224
(410) 633-1800
FAX NO.
(410) 633-5443
www.gascoyne.com

REPORT OF ANALYSIS

Report no: **0002830**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 1-1 (5-22-00); comp collected on 22-May-00(14:45)**
Laboratory Sample Number: 000009920

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	0.10 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:16)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:16)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	27-May-00(18:16)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:16)
Trichloroethene	0.026 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:16)
Vinyl Chloride	0.10 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	27-May-00(18:16)
Dibromofluoromethane(surrogate)	90 % Rec	NA	EPA-8260B	THP	27-May-00(18:16)
1,2-Dichloroethane-d4(surrogate)	103 % Rec	NA	EPA-8260B	THP	27-May-00(18:16)
Toluene-d8(surrogate)	99 % Rec	NA	EPA-8260B	THP	27-May-00(18:16)
Bromofluorobenzene(surrogate)	105 % Rec	NA	EPA-8260B	THP	27-May-00(18:16)

Sample/Test Notes:
A total analysis was performed on this sample, the results reflect the 20 times dilution in TCLP.

Flashpoint	>200 °F	NA	EPA-1020A	PRM	07-Jun-00(15:30)
Residue at 105°C	59.5 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	24-May-00(15:24)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	06-Jun-00(19:18)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:15)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:15)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:15)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:15)

REPORT OF ANALYSIS

Report no: **0002830**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 1-1 (5-22-00); comp collected on 22-May-00(14:45)**
Laboratory Sample Number: 000009920

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:15)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:15)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:15)
pH	9.6 pH units	NA	EPA-9045C	VAS	24-May-00(11:14)
Temperature at analysis	20.4 °C	NA	EPA-9045C	VAS	24-May-00(11:14)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	25-May-00(07:05)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	25-May-00(08:15)

Report no: **0002830**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 1-2 (5-22-00); comp collected on 22-May-00(13:20)**
Laboratory Sample Number: 000009921

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	<2 ppm-dwb	2 ppm-dwb	EPA-8082	MST	24-May-00(13:11)
Decachlorobiphenyl(surrogate)	80 % Rec	NA	EPA-8082	MST	24-May-00(13:11)
Tetrachloro-m-xylene(surrogate)	79 % Rec	NA	EPA-8082	MST	24-May-00(13:11)
Total Cresols	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(19:57)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(19:57)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(19:57)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(19:57)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(19:57)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(19:57)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	05-Jun-00(19:57)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(19:57)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(19:57)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	05-Jun-00(19:57)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(19:57)
2-Fluorophenol(surrogate)	26 % Rec	NA	EPA-8270C	MYD	05-Jun-00(19:57)
Phenol-d5(surrogate)	34 % Rec	NA	EPA-8270C	MYD	05-Jun-00(19:57)
Nitrobenzene-d5(surrogate)	83 % Rec	NA	EPA-8270C	MYD	05-Jun-00(19:57)
2-Fluorobiphenyl(surrogate)	78 % Rec	NA	EPA-8270C	MYD	05-Jun-00(19:57)
2,4,6-Tribromophenol(surrogate)	84 % Rec	NA	EPA-8270C	MYD	05-Jun-00(19:57)
Terphenyl-d14(surrogate)	80 % Rec	NA	EPA-8270C	MYD	05-Jun-00(19:57)
Benzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:49)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:49)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:49)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:49)

Report no: **0002830**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 1-2 (5-22-00); comp collected on 22-May-00(13:20)**
Laboratory Sample Number: 000009921

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:49)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:49)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	27-May-00(18:49)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:49)
[illegible]hloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(18:49)
[illegible]l Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	27-May-00(18:49)
Dibromofluoromethane(surrogate)	90 % Rec	NA	EPA-8260B	THP	27-May-00(18:49)
1,2-Dichloroethane-d4(surrogate)	104 % Rec	NA	EPA-8260B	THP	27-May-00(18:49)
Toluene-d8(surrogate)	99 % Rec	NA	EPA-8260B	THP	27-May-00(18:49)
Bromofluorobenzene(surrogate)	104 % Rec	NA	EPA-8260B	THP	27-May-00(18:49)

Sample/Test Notes:
A total analysis was performed on this sample, the results reflect the 20 times dilution in TCLP.

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
Flashpoint	>200 °F	NA	EPA-1020A	PRM	07-Jun-00(15:30)
Residue at 105°C	56.6 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	24-May-00(15:24)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	06-Jun-00(19:24)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:34)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:34)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:34)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:34)

Report no: **0002830**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 1-2 (5-22-00); comp collected on 22-May-00(13:20)**
Laboratory Sample Number: 000009921

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:34)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:34)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:34)
pH	10.2 pH units	NA	EPA-9045C	VAS	24-May-00(11:15)
Temperature at analysis	21.2 °C	NA	EPA-9045C	VAS	24-May-00(11:15)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	25-May-00(07:05)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	25-May-00(08:15)

Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

TCLP

Toxicity Characteristic Leaching Procedure

METALS	**Regulatory limits mg/L**
Arsenic (As)	5.0
Barium (Ba)	100.0
Cadmium (Cd)	1.0
Chromium (Cr)	5.0
Lead (Pb)	5.0
Mercury (Hg)	0.2
Selenium (Se)	1.0
Silver (Ag)	5.0

HERBICIDES/ PESTICIDES	**Regulatory limits mg/L**
2,4-D	10.0
2,4,5-TP (Silvex)	1.0
Chlordane	0.03
Endrin	0.02
Heptachlor and Epoxide	0.008
Lindane	0.4
Methoxychlor	10.0
Toxaphene	0.5

SEMI-VOLATILES	**Regulatory limits mg/L**
Total Cresols (ortho, para & meta)	200.0
2,4-Dinitrotoluene	0.13
Hexachloro-1,3-butadiene	0.5
Hexachlorobenzene	0.13
Hexachloroethane	3.0
Nitrobenzene	2.0
Pentachlorophenol	100.0
2,4,5-Trichlorophenol	400.0
2,4,6-Trichlorophenol	2.0
Pyridine	5.0
1,4-Dichlorobenzene	7.5

VOLATILES	**Regulatory limits mg/L**
Benzene	0.50
Carbon Tetrachloride	0.50
Chlorobenzene	100.0
Chloroform	6.0
1,2-Dichloroethene	0.50
1,1-Dichloroethene	0.70
Methyl Ethyl Ketone	200.0
Tetrachloroethene	0.7
Trichloroethene	0.5
Vinyl Chloride	0.20

Please see reverse side for explanation of terms and other information.

SAMPLE SUBMITTAL – CHAIN-OF-CUSTODY

Page 1 of 1

GASCOYNE LABORATORIES, INC.

2101 Van Deman Street • Baltimore, MD 21224
410-633-1800 • FAX: 410-633-5443

SAMPLE TYPE CODES					
Field Blank	FB	Sludge	SL	Drinking Water	DW
Soil	SO	Trip Blank	TB	Ground Water	GW
Oil(s)	OL	Waste- Liquid	L	Surface Water	SW
Paint Chips	PC	- Solid	S	Waste Water	WW
Wipes	WP				

LAB USE ONLY

Report # 0002830
Temp. Blk. 2.6
Cooler # 50
PUC #

Test Results to:

Company: BETHLEHEM STEEL CORP.
Contact: NICK FRANCO
Phone No. 610 694 3019
FAX No. 610 694 1524

Sample Site/Project BSC - SI
Sampler/MDOE # MAXIM TECH
Gascoyne Quote #
Client's P.O. #

RESULTS NEEDED BY: ☐ ROUTINE ☐ PRIORITY* BY: ______ TIME ______ DAY ______ DATE

TESTS REQUIRED

LIMS NO. LAB USE ONLY	SAMPLE TYPE USE CODES ABOVE if applicable	SAMPLE IDENTIFICATION (Keep brief - 14 Characters Max)	DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	NUMBER OF CONTAINERS	125mL VOA vial	500mL Glass	COMMENTS (i.e. Data Package, methods, detection limits, etc.)
	SL	1-1 (5 22 00)	5.22.00	1445	X		4	XXX	X	
	SL	1-2 (5 22 00)	5/22/00	1320	X		4	XXX	X	

Total Number of Containers 8

Data Package Required ☐ 1 ☐ 2 ☐ 3

Relinquished By (signature):	Printed Name/Affiliation: Anthony J. Nolan/BSC Cons.	Date: 5.22.00 Time: 1720.	Received By (signature): fed ex at Airport.
Relinquished By (signature): FED EX	Printed Name/Affiliation:	Date: Time:	Received By (signature):
Relinquished By (signature):	Printed Name/Affiliation:	Date: Time:	Received By (signature):
Relinquished By (signature):	Printed Name/Affiliation:	Date: Time:	Received By (signature):

Printed Name/Affiliation:	Date: Time:
Printed Name/Affiliation:	Date: Time:
Printed Name/Affiliation:	Date: Time:
Printed Name/Affiliation:	Date: Time:

WHITE COPY - LAB YELLOW - REPORT COPY PINK - CLIENT SAMPLE SUBMITTAL RECEIPT

501 3.99

Gascoyne Laboratories, Inc.
Baltimore, MD 21224
(410) 633-1800
FAX NO.
(410) 633-5443
www.gascoyne.com

REPORT OF ANALYSIS

Page 1 of 10
Report No: 0002843

Bethlehem Steel Corp.
1170 8th Ave.
Bethlehem, PA 18016

Attn: Nick Franco

This report of analysis contains test results for the following samples submitted to Gascoyne Laboratories, Inc. for project BSC-SI:

Client Sample I.D.,	Sample Type	Lab Sample No.	Received by Gascoyne
2-1 (5-23-00); comp, 23-May-2000(0812)	Sludge	000009942	24-May-2000
4-1 (5-23-00); comp, 23-May-2000(1010)	Sludge	000009943	24-May-2000
3-1 (5-23-00); comp, 23-May-2000(1120)	Sludge	000009944	24-May-2000

This Report contains the following:

A) Cover Letter
B) Test Results
C) Chain-of-Custody

All samples were analyzed following EPA protocols and other recognized methodologies as specified in the report. All laboratory Quality Control(QC) data associated with this report are within established control limits unless otherwise noted in this report.

Gascoyne Laboratories, Inc. laboratory identification numbers:

Maryland :109; Delaware: MD015; Virginia: 00152; New Jersey: 60637; Pennsylvania: 68-339; New York: 11158; A2LA: 410.01; AIHA:100491; US Army Corps of Engineers; and EPA ICR: ICRMD003.

The analyses specified in this report may or may not be included in the scopes of the above listed certifications.

This cover page is an integral part of this report and must be included with all copies of this report.

James H Newman
Final report reviewed by: James H. Newman, Client Services Manager

6/9/00
Report issue date

Report no: **0002843**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 2-1 (5-23-00); comp collected on 23-May-00(08:12)**
Laboratory Sample Number: 000009942

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	<2 ppm-dwb	2 ppm-dwb	EPA-8082	MST	24-May-00(16:27)
Decachlorobiphenyl(surrogate)	73 % Rec	NA	EPA-8082	MST	24-May-00(16:27)
Tetrachloro-m-xylene(surrogate)	72 % Rec	NA	EPA-8082	MST	24-May-00(16:27)
Total Cresols	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(13:48)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(13:48)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(13:48)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(13:48)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(13:48)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(13:48)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	06-Jun-00(13:48)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(13:48)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(13:48)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	06-Jun-00(13:48)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(13:48)
2-Fluorophenol(surrogate)	44 % Rec	NA	EPA-8270C	MYD	06-Jun-00(13:48)
Phenol-d5(surrogate)	34 % Rec	NA	EPA-8270C	MYD	06-Jun-00(13:48)
Nitrobenzene-d5(surrogate)	82 % Rec	NA	EPA-8270C	MYD	06-Jun-00(13:48)
2-Fluorobiphenyl(surrogate)	75 % Rec	NA	EPA-8270C	MYD	06-Jun-00(13:48)
2,4,6-Tribromophenol(surrogate)	78 % Rec	NA	EPA-8270C	MYD	06-Jun-00(13:48)
Terphenyl-d14(surrogate)	81 % Rec	NA	EPA-8270C	MYD	06-Jun-00(13:48)
Benzene	**0.04 mg/l TC**	0.025 mg/l TC	EPA-8260B	THP	27-May-00(20:28)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(20:28)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(20:28)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(20:28)

REPORT OF ANALYSIS

Report no: **0002843**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 2-1 (5-23-00); comp collected on 23-May-00(08:12)**
Laboratory Sample Number: 000009942

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(20:28)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(20:28)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	27-May-00(20:28)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(20:28)
Trichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(20:28)
Vinyl Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	27-May-00(20:28)
Dibromofluoromethane(surrogate)	99 % Rec	NA	EPA-8260B	THP	27-May-00(20:28)
1,2-Dichloroethane-d4(surrogate)	110 % Rec	NA	EPA-8260B	THP	27-May-00(20:28)
Toluene-d8(surrogate)	99 % Rec	NA	EPA-8260B	THP	27-May-00(20:28)
Bromofluorobenzene(surrogate)	102 % Rec	NA	EPA-8260B	THP	27-May-00(20:28)

Sample/Test Notes:
A total analysis was performed on this sample, the results reflect the 20 times dilution in TCLP.

Flashpoint	>200 °F	NA	EPA-1020A	PRM	08-Jun-00(11:45)
Residue at 105°C	63.8 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	24-May-00(15:24)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	06-Jun-00(19:36)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:45)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:45)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:45)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:45)

Report no: **0002843**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 2-1 (5-23-00); comp collected on 23-May-00(08:12)**
Laboratory Sample Number: 000009942

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:45)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:45)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:45)
pH	10.0 pH units	NA	EPA-9045C	VAS	24-May-00(11:22)
Temperature at analysis	21.4 °C	NA	EPA-9045C	VAS	24-May-00(11:22)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	25-May-00(07:05)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	25-May-00(08:15)

Report no: **0002843**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 4-1 (5-23-00); comp collected on 23-May-00(10:10)**
Laboratory Sample Number: 000009943

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	<1 ppm-dwb	1 ppm-dwb	EPA-8082	MST	24-May-00(17:00)
Decachlorobiphenyl(surrogate)	84 % Rec	NA	EPA-8082	MST	24-May-00(17:00)
Tetrachloro-m-xylene(surrogate)	81 % Rec	NA	EPA-8082	MST	24-May-00(17:00)
Total Cresols	0.28 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(14:39)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(14:39)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(14:39)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(14:39)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(14:39)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(14:39)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	06-Jun-00(14:39)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(14:39)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(14:39)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	06-Jun-00(14:39)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(14:39)
2-Fluorophenol(surrogate)	28 % Rec	NA	EPA-8270C	MYD	06-Jun-00(14:39)
Phenol-d5(surrogate)	36 % Rec	NA	EPA-8270C	MYD	06-Jun-00(14:39)
Nitrobenzene-d5(surrogate)	86 % Rec	NA	EPA-8270C	MYD	06-Jun-00(14:39)
2-Fluorobiphenyl(surrogate)	78 % Rec	NA	EPA-8270C	MYD	06-Jun-00(14:39)
2,4,6-Tribromophenol(surrogate)	81 % Rec	NA	EPA-8270C	MYD	06-Jun-00(14:39)
Terphenyl-d14(surrogate)	83 % Rec	NA	EPA-8270C	MYD	06-Jun-00(14:39)
Benzene	0.31 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:01)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:01)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:01)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:01)

REPORT OF ANALYSIS

Report no: **0002843**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 4-1 (5-23-00); comp collected on 23-May-00(10:10)**
Laboratory Sample Number: 000009943

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:01)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:01)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	27-May-00(21:01)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:01)
Trichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:01)
Vinyl Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	27-May-00(21:01)
Dibromofluoromethane(surrogate)	103 % Rec	NA	EPA-8260B	THP	27-May-00(21:01)
1,2-Dichloroethane-d4(surrogate)	114 % Rec	NA	EPA-8260B	THP	27-May-00(21:01)
Toluene-d8(surrogate)	99 % Rec	NA	EPA-8260B	THP	27-May-00(21:01)
Bromofluorobenzene(surrogate)	104 % Rec	NA	EPA-8260B	THP	27-May-00(21:01)

Sample/Test Notes:
A total analysis was performed on this sample, the results reflect the 20 times dilution in TCLP.

Flashpoint	>200 °F	NA	EPA-1020A	PRM	08-Jun-00(11:45)
Residue at 105°C	77.7 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	24-May-00(15:24)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	06-Jun-00(19:38)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:48)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:48)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:48)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:48)

Report no: **0002843**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 4-1 (5-23-00); comp collected on 23-May-00(10:10)**
Laboratory Sample Number: 000009943

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:48)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:48)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:48)
pH	11.0 pH units	NA	EPA-9045C	VAS	24-May-00(11:24)
Temperature at analysis	21.6 °C	NA	EPA-9045C	VAS	24-May-00(11:24)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	25-May-00(07:05)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	25-May-00(08:15)

Report no: **0002843**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 3-1 (5-23-00); comp collected on 23-May-00(11:20)**
Laboratory Sample Number: 000009944

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	<2 ppm-dwb	2 ppm-dwb	EPA-8082	MST	24-May-00(17:32)
Decachlorobiphenyl(surrogate)	83 % Rec	NA	EPA-8082	MST	24-May-00(17:32)
Tetrachloro-m-xylene(surrogate)	82 % Rec	NA	EPA-8082	MST	24-May-00(17:32)
Total Cresols	0.14 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(15:20)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(15:20)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(15:20)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(15:20)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(15:20)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(15:20)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	06-Jun-00(15:20)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(15:20)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(15:20)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	06-Jun-00(15:20)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	06-Jun-00(15:20)
2-Fluorophenol(surrogate)	46 % Rec	NA	EPA-8270C	MYD	06-Jun-00(15:20)
Phenol-d5(surrogate)	35 % Rec	NA	EPA-8270C	MYD	06-Jun-00(15:20)
Nitrobenzene-d5(surrogate)	86 % Rec	NA	EPA-8270C	MYD	06-Jun-00(15:20)
2-Fluorobiphenyl(surrogate)	79 % Rec	NA	EPA-8270C	MYD	06-Jun-00(15:20)
2,4,6-Tribromophenol(surrogate)	81 % Rec	NA	EPA-8270C	MYD	06-Jun-00(15:20)
Terphenyl-d14(surrogate)	85 % Rec	NA	EPA-8270C	MYD	06-Jun-00(15:20)
Benzene	0.13 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:34)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:34)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:34)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:34)

Report no: **0002843**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 3-1 (5-23-00); comp collected on 23-May-00(11:20)**
Laboratory Sample Number: 000009944

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:34)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:34)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	27-May-00(21:34)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:34)
Trichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(21:34)
Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	27-May-00(21:34)
Dibromofluoromethane(surrogate)	100 % Rec	NA	EPA-8260B	THP	27-May-00(21:34)
1,2-Dichloroethane-d4(surrogate)	116 % Rec	NA	EPA-8260B	THP	27-May-00(21:34)
Toluene-d8(surrogate)	98 % Rec	NA	EPA-8260B	THP	27-May-00(21:34)
Bromofluorobenzene(surrogate)	105 % Rec	NA	EPA-8260B	THP	27-May-00(21:34)

Sample/Test Notes:
A total analysis was performed on this sample, the results reflect the 20 times dilution in TCLP.

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
Flashpoint	>200 °F	NA	EPA-1020A	PRM	08-Jun-00(11:45)
Residue at 105°C	53.9 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	24-May-00(15:24)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	06-Jun-00(19:40)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:52)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:52)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:52)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:52)

Report no: **0002843**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 3-1 (5-23-00); comp collected on 23-May-00(11:20)**
Laboratory Sample Number: 000009944

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:52)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:52)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:52)
pH	10.9 pH units	NA	EPA-9045C	VAS	24-May-00(11:23)
Temperature at analysis	21.5 °C	NA	EPA-9045C	VAS	24-May-00(11:23)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	25-May-00(07:05)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	25-May-00(08:15)

Please see reverse side for explanation of terms and other information.

Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

TCLP

Toxicity Characteristic Leaching Procedure

METALS	Regulatory limits mg/L
Arsenic (As)	5.0
Barium (Ba)	100.0
Cadmium (Cd)	1.0
Chromium (Cr)	5.0
Lead (Pb)	5.0
Mercury (Hg)	0.2
Selenium (Se)	1.0
Silver (Ag)	5.0

HERBICIDES/ PESTICIDES	Regulatory limits mg/L
2,4-D	10.0
2,4,5-TP (Silvex)	1.0
Chlordane	0.03
Endrin	0.02
Heptachlor and Epoxide	0.008
Lindane	0.4
Methoxychlor	10.0
Toxaphene	0.5

SEMI-VOLATILES	Regulatory limits mg/L
Total Cresols (ortho, para & meta)	200.0
2,4-Dinitrotoluene	0.13
Hexachloro-1,3-butadiene	0.5
Hexachlorobenzene	0.13
Hexachloroethane	3.0
Nitrobenzene	2.0
Pentachlorophenol	100.0
2,4,5-Trichlorophenol	400.0
2,4,6-Trichlorophenol	2.0
Pyridine	5.0
1,4-Dichlorobenzene	7.5

VOLATILES	Regulatory limits mg/L
Benzene	0.50
Carbon Tetrachloride	0.50
Chlorobenzene	100.0
Chloroform	6.0
1,2-Dichloroethene	0.50
1,1-Dichloroethene	0.70
Methyl Ethyl Ketone	200.0
Tetrachloroethene	0.7
Trichloroethene	0.5
Vinyl Chloride	0.20

Please see reverse side for explanation of terms and other information.

SAMPLE SUBMITTAL — CHAIN-OF-CUSTODY

Page 1 of 1

0001813

GASCOYNE LABORATORIES, INC.

2101 Van Deman Street • Baltimore, MD 21224
410-633-1800 • FAX: 410-633-5443

SAMPLE TYPE CODES

Field Blank	FB	Sludge	SL	Drinking Water	DW
Soil	SO	Trip Blank	TB	Ground Water	GW
Oil(s)	OL	Waste- Liquid	L	Surface Water	SW
Paint Chips	PC	- Solid	S	Waste Water	WW
Wipes	WP				

LAB USE ONLY

Report # ~~[illegible]~~
Temp. Blk.
Cooler #
PUC #

Test Results to:

Company: Bethlehem Steel Corp.
Contact: Nick Franco
Phone No. 610 694 3014
FAX No. 610 · 694 · 1524

Sample Site/Project BSC 51
Sampler/MDOE # MAXIM TECH
Gascoyne Quote #
Client's P.O. #

RESULTS NEEDED BY: ☐ **ROUTINE** ☐ **PRIORITY*** **BY:** ______ TIME ______ DAY ______ DATE

TESTS REQUIRED

LIMS NO. LAB USE ONLY	SAMPLE TYPE USE CODES ABOVE if applicable	SAMPLE IDENTIFICATION (Keep brief - 14 Characters Max)	DATE COL-LECTED	TIME COL-LECTED	COMPOSITE	GRAB	NUMBER OF CON-TAINERS	125ml VOA w/ Al TCLP VOCs w/ [illegible]	500ml glass [illegible] React/Corros TCLP [illegible] TCLP [illegible] Total PCBs						COMMENTS (i.e. Data Package, methods, detection limits, etc.)
~~[illegible]~~	SL	2 - 1 (5-23-00)	5/23/00	0812	X		4	XXX	X						
~~[illegible]~~	SL	4 - 1 (5-23-00)	5/23/00	1010	X		4	XXX	X						
~~[illegible]~~	SL	3 - 1 (5-23-00)	5/23/00	1120	X		4	XXX	X						

Total Number of Containers 12

Data Package Required ☐ 1 ☐ 2 ☐ 3

Relinquished By (signature): Anthony J. Notaro	Printed Name/Affiliation: Anthony J. Notaro/BSC Cons.	Date: 5·23·00 Time: 1415		Received By (signature): Fed Ex At Airport	Printed Name/Affiliation:	Date: Time:	
Relinquished By (signature): Fed Ex	Printed Name/Affiliation: FEDERAL EXPRESS	Date: Time:		Received By (signature): Nancy Chappell	Printed Name/Affiliation: GL	Date: Time:	5/24/00 0950
Relinquished By (signature):	Printed Name/Affiliation:	Date: Time:		Received By (signature):	Printed Name/Affiliation:	Date: Time:	
Relinquished By (signature):	Printed Name/Affiliation:	Date: Time:		Received By (signature):	Printed Name/Affiliation:	Date: Time:	

501 3.99

* Max Rec Surcharge

WHITE COPY - LAB YELLOW - REPORT CO PINK - CLIENT SAMPLE SUBMITTAL RECEIPT

Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

Page 1 of 7
Report No: 0002831

Bethlehem Steel Corp.
1170 8th Ave.
Bethlehem, PA 18016

Attn: Nick Franco

This report of analysis contains test results for the following samples submitted to Gascoyne Laboratories, Inc. for project BSC-S1:

Client Sample I.D.,	Sample Type	Lab Sample No.	Received by Gascoyne
1-3 (5/22/00); comp, 22-May-2000(1120)	Sludge	000009922	23-May-2000
1-4A (5-22-00); comp, 22-May-2000(0955)	Sludge	000009923	23-May-2000

This Report contains the following:

A) Cover Letter
B) Test Results
C) Chain-of-Custody

All samples were analyzed following EPA protocols and other recognized methodologies as specified in the report. All laboratory Quality Control(QC) data associated with this report are within established control limits unless otherwise noted in this report.

Gascoyne Laboratories, Inc. laboratory identification numbers:

Maryland :109; Delaware: MD015; Virginia: 00152; New Jersey: 60637; Pennsylvania: 68-339; New York: 11158; A2LA: 410.01; AIHA:100491; US Army Corps of Engineers; and EPA ICR: ICRMD003.

The analyses specified in this report may or may not be included in the scopes of the above listed certifications.

This cover page is an integral part of this report and must be included with all copies of this report.

James H Newman

Final report reviewed by: James H. Newman, Client Services Manager

6/9/00
Report issue date

everse side for explanation of terms and other information

Report no: **0002831**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 1-3 (5/22/00); comp collected on 22-May-00(11:20)**
Laboratory Sample Number: 000009922

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	<2 ppm-dwb	2 ppm-dwb	EPA-8082	MST	24-May-00(14:16)
Decachlorobiphenyl(surrogate)	87 % Rec	NA	EPA-8082	MST	24-May-00(14:16)
Tetrachloro-m-xylene(surrogate)	87 % Rec	NA	EPA-8082	MST	24-May-00(14:16)
Total Cresols	0.45 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(20:37)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(20:37)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(20:37)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(20:37)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(20:37)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(20:37)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	05-Jun-00(20:37)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(20:37)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(20:37)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	05-Jun-00(20:37)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(20:37)
2-Fluorophenol(surrogate)	45 % Rec	NA	EPA-8270C	MYD	05-Jun-00(20:37)
Phenol-d5(surrogate)	33 % Rec	NA	EPA-8270C	MYD	05-Jun-00(20:37)
Nitrobenzene-d5(surrogate)	81 % Rec	NA	EPA-8270C	MYD	05-Jun-00(20:37)
2-Fluorobiphenyl(surrogate)	74 % Rec	NA	EPA-8270C	MYD	05-Jun-00(20:37)
2,4,6-Tribromophenol(surrogate)	82 % Rec	NA	EPA-8270C	MYD	05-Jun-00(20:37)
Terphenyl-d14(surrogate)	78 % Rec	NA	EPA-8270C	MYD	05-Jun-00(20:37)
Benzene	0.062 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:22)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:22)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:22)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:22)

Report no: **0002831**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 1-3 (5/22/00); comp collected on 22-May-00(11:20)**
Laboratory Sample Number: 000009922

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:22)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:22)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	27-May-00(19:22)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:22)
T hloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:22)
Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	27-May-00(19:22)
Dibromofluoromethane(surrogate)	90 % Rec	NA	EPA-8260B	THP	27-May-00(19:22)
1,2-Dichloroethane-d4(surrogate)	102 % Rec	NA	EPA-8260B	THP	27-May-00(19:22)
Toluene-d8(surrogate)	97 % Rec	NA	EPA-8260B	THP	27-May-00(19:22)
Bromofluorobenzene(surrogate)	103 % Rec	NA	EPA-8260B	THP	27-May-00(19:22)

Sample/Test Notes:
A total analysis was performed on this sample, the results reflect the 20 times dilution in TCLP.

Flashpoint	>200 °F	NA	EPA-1020A	PRM	07-Jun-00(15:30)
Residue at 105°C	61.8 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	24-May-00(15:24)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	06-Jun-00(19:26)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:37)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:37)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:37)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:37)

REPORT OF ANALYSIS

Report no: **0002831**
Client: **Bethlehem Steel Corp.**
Sample Id: **Submitted samples: 1-3 (5/22/00); comp collected on 22-May-00(11:20)**
Laboratory Sample Number: 000009922

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:37)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:37)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:37)
pH	11.2 pH units	NA	EPA-9045C	VAS	24-May-00(11:16)
Temperature at analysis	21.2 °C	NA	EPA-9045C	VAS	24-May-00(11:16)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	25-May-00(07:05)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	25-May-00(08:15)

Report no: **0002831**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 1-4A (5-22-00); comp collected on 22-May-00(09:55)**
Laboratory Sample Number: 000009923

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
PCBs	<2 ppm-dwb	2 ppm-dwb	EPA-8082	MST	24-May-00(14:49)
Decachlorobiphenyl(surrogate)	76 % Rec	NA	EPA-8082	MST	24-May-00(14:49)
Tetrachloro-m-xylene(surrogate)	75 % Rec	NA	EPA-8082	MST	24-May-00(14:49)
Total Cresols	**0.15 mg/l TC**	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(21:17)
2,4-Dinitrotoluene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(21:17)
Hexachloro-1,3-butadiene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(21:17)
Hexachlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(21:17)
Hexachloroethane	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(21:17)
Nitrobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(21:17)
Pentachlorophenol	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	05-Jun-00(21:17)
2,4,5-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(21:17)
2,4,6-Trichlorophenol	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(21:17)
Pyridine	<0.5 mg/l TC	0.5 mg/l TC	EPA-8270C	MYD	05-Jun-00(21:17)
1,4-Dichlorobenzene	<0.1 mg/l TC	0.1 mg/l TC	EPA-8270C	MYD	05-Jun-00(21:17)
2-Fluorophenol(surrogate)	22 % Rec	NA	EPA-8270C	MYD	05-Jun-00(21:17)
Phenol-d5(surrogate)	29 % Rec	NA	EPA-8270C	MYD	05-Jun-00(21:17)
Nitrobenzene-d5(surrogate)	73 % Rec	NA	EPA-8270C	MYD	05-Jun-00(21:17)
2-Fluorobiphenyl(surrogate)	67 % Rec	NA	EPA-8270C	MYD	05-Jun-00(21:17)
2,4,6-Tribromophenol(surrogate)	72 % Rec	NA	EPA-8270C	MYD	05-Jun-00(21:17)
Terphenyl-d14(surrogate)	72 % Rec	NA	EPA-8270C	MYD	05-Jun-00(21:17)
Benzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:55)
Carbon Tetrachloride	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:55)
Chlorobenzene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:55)
Chloroform	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:55)

Report no: **0002831**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 1-4A (5-22-00); comp collected on 22-May-00(09:55)**
Laboratory Sample Number: 000009923

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
1,2-Dichloroethane	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:55)
1,1-Dichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:55)
Methyl Ethyl Ketone	<1.2 mg/l TC	1.2 mg/l TC	EPA-8260B	THP	27-May-00(19:55)
Tetrachloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:55)
Trichloroethene	<0.025 mg/l TC	0.025 mg/l TC	EPA-8260B	THP	27-May-00(19:55)
Vinyl Chloride	<0.05 mg/l TC	0.05 mg/l TC	EPA-8260B	THP	27-May-00(19:55)
Dibromofluoromethane(surrogate)	91 % Rec	NA	EPA-8260B	THP	27-May-00(19:55)
1,2-Dichloroethane-d4(surrogate)	103 % Rec	NA	EPA-8260B	THP	27-May-00(19:55)
Toluene-d8(surrogate)	100 % Rec	NA	EPA-8260B	THP	27-May-00(19:55)
Bromofluorobenzene(surrogate)	103 % Rec	NA	EPA-8260B	THP	27-May-00(19:55)

Sample/Test Notes:
A total analysis was performed on this sample, the results reflect the 20 times dilution in TCLP.

Flashpoint	>200 °F	NA	EPA-1020A	PRM	07-Jun-00(15:30)
Residue at 105°C	66.7 %-arb	0.01 %-arb	CLP-SOW-ILM04.0	VJR	24-May-00(15:24)
TCLP, Mercury(Hg)	<0.01 mg/l TC	0.01 mg/l TC	EPA-7470A	JLS	06-Jun-00(19:28)
TCLP, Arsenic(As)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:41)
TCLP, Barium(Ba)	<5 mg/l TC	5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:41)
TCLP, Cadmium(Cd)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:41)
TCLP, Chromium(Cr)	<0.1 mg/l TC	0.1 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:41)

REPORT OF ANALYSIS

Report no: **0002831**

Client: **Bethlehem Steel Corp.**

Sample Id: **Submitted samples: 1-4A (5-22-00); comp collected on 22-May-00(09:55)**
Laboratory Sample Number: 000009923

Parameter	Test Results	Laboratory Reporting Limit	Method	Analyst	Date of Analysis
TCLP, Lead(Pb)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:41)
TCLP, Selenium(Se)	<0.5 mg/l TC	0.5 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:41)
TCLP, Silver(Ag)	<0.05 mg/l TC	0.05 mg/l TC	EPA-6010B	JSM	05-Jun-00(17:41)
pH	10.8 pH units	NA	EPA-9045C	VAS	24-May-00(11:17)
Temperature at analysis	21.0 °C	NA	EPA-9045C	VAS	24-May-00(11:17)
Reactive Cyanide	<1 ppm-arb	1 ppm-arb	EPA-SW-846 7.3	RED	25-May-00(07:05)
Reactive Sulfide	<10 ppm-arb	10 ppm-arb	EPA-SW 846 7.3	RED	25-May-00(08:15)

Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

TCLP

Toxicity Characteristic Leaching Procedure

METALS	Regulatory limits mg/L
Arsenic (As)	5.0
Barium (Ba)	100.0
Cadmium (Cd)	1.0
Chromium (Cr)	5.0
Lead (Pb)	5.0
Mercury (Hg)	0.2
Selenium (Se)	1.0
Silver (Ag)	5.0

HERBICIDES/ PESTICIDES	Regulatory limits mg/L
2,4-D	10.0
2,4,5-TP (Silvex)	1.0
Chlordane	0.03
Endrin	0.02
Heptachlor and Epoxide	0.008
Lindane	0.4
Methoxychlor	10.0
Toxaphene	0.5

SEMI-VOLATILES	Regulatory limits mg/L
Total Cresols (ortho, para & meta)	200.0
2,4-Dinitrotoluene	0.13
Hexachloro-1,3-butadiene	0.5
Hexachlorobenzene	0.13
Hexachloroethane	3.0
Nitrobenzene	2.0
Pentachlorophenol	100.0
2,4,5-Trichlorophenol	400.0
2,4,6-Trichlorophenol	2.0
Pyridine	5.0
1,4-Dichlorobenzene	7.5

VOLATILES	Regulatory limits mg/L
Benzene	0.50
Carbon Tetrachloride	0.50
Chlorobenzene	100.0
Chloroform	6.0
1,2-Dichloroethene	0.50
1,1-Dichloroethene	0.70
Methyl Ethyl Ketone	200.0
Tetrachloroethene	0.7
Trichloroethene	0.5
Vinyl Chloride	0.20

side for explanation of terms and other information.

SAMPLE SUBMITTAL- CHAIN-OF-CUSTODY

P 1 of 1

GASCOYNE LABORATORIES, INC.

2101 Van Deman Street • Baltimore, MD 21224
410-633-1800 • FAX: 410-633-5443

SAMPLE TYPE CODES

Field Blank	FB	Sludge	SL	Drinking Water	DW
Soil	SO	Trip Blank	TB	Ground Water	GW
Oil(s)	OL	Waste- Liquid	L	Surface Water	SW
Paint Chips	PC	- Solid	S	Waste Water	WW
Wipes	WP				

LAB USE ONLY

Report # KK028311
Temp. Blk. 14
Cooler # .7
PUC #

Test Results to:

Company: Bethlehem Steel Corp.
Contact: Nick Franco
Phone No. 610 · 694 · 3019
FAX No. 610 · 694 · 1524

Sample Site/Project BSC SI
Sampler/MDOE # Maxim Tech
Gascoyne Quote #
Client's P.O. #

RESULTS NEEDED BY: ☐ **ROUTINE** ☐ **PRIORITY* BY:** 10/10/00 ____ TIME ____ DAY ____ DATE

TESTS REQUIRED

LIMS NO. LAB USE ONLY	SAMPLE TYPE USE CODES ABOVE if applicable	SAMPLE IDENTIFICATION (Keep brief - 14 Characters Max)	DATE COL-LECTED	TIME COL-LECTED	COMPOSITE	GRAB	NUMBER OF CON-TAINERS	125 mL VOA VIAL TCLP VOCs	500 mL GLASS Ignitability React. / Corros. TCLP SVOCs TCLP Metals Total PCBs						COMMENTS (i.e. Data Package, methods, detection limits, etc.)
	SL	1-3(5/22/00)	5/22/00	1120	X		4	XXX	X						
	SL	1-4A(5-22-00)	5/22/00	0955	X		4	XXX	X						

Total Number of Containers

Data Package Required ☐ 1 ☐ 2 ☐ 3

Relinquished By (signature):	Printed Name/Affiliation: Anthony J. Notaro / BSC Cons	Date: 5-22-00 Time: 1720		Received By (signature): Fed Ex At Airport	Printed Name/Affiliation:	Date: Time:	
Relinquished By (signature): FED EX	Printed Name/Affiliation:	Date: Time:		Received By (signature):	Printed Name/Affiliation: GCL	Date: 5-23-00 Time: 0915	
Relinquished By (signature):	Printed Name/Affiliation:	Date: Time:		Received By (signature):	Printed Name/Affiliation:	Date: Time:	
Relinquished By (signature):	Printed Name/Affiliation:	Date: Time:		Received By (signature):	Printed Name/Affiliation:	Date: Time:	

501 3.99

WHITE COPY - LAB YELLOW - REPORT COPY PINK - CLIENT SAMPLE SUBMITTAL RECEIPT

MAXIM
TECHNOLOGIES INC

June 27, 2000

Bethlehem Steel Corporation
Environmental Affairs
1170 8th Avenue
Bethlehem, PA 18016-7699

Attention: Mr. Nicholas B. Franco, Ph.D.
Senior Engineer

Reference: **SWMU S1 Drilling and Sampling**
Bethlehem Steel Corporation- Lackawanna Facility
Lackawanna, New York 14218
Project Number 20-01442

Dear Mr. Franco:

Maxim Technologies of New York, Inc. (Maxim), has completed the drilling and sampling services for the above referenced project for Bethlehem Steel Corporation (BSC) - Environmental Affairs (EA). The project was completed in accordance with the scope-of-work specified in the Maxim Proposal Number PB-20-0054-Change Order Request #2, dated May 18, 2000.

The tasks completed for this project are summarized below.

Task 1 Water Sample Collection/Analysis

Maxim sampling personnel collected four water samples from the "USF Filter" apparatus effluent stream. The sampling events, collected throughout the evacuation process of SWMU S1 water, were completed on May 3, May 5, May 8 and May 12, 2000. Each sample set collected was properly preserved to facilitate analytical testing by Gascoyne Laboratories, Inc. (GL). It should be noted that BSC EA contracted directly with GL for completion of the analytical testing services.

The necessary equipment to facilitate containerization/preservation of the collected samples was supplied by GL. Maxim personnel packaged the samples in GL provided containers and coordinated their transport to GL via FedEx "Next Morning Delivery" parcel service. Maxim was not responsible for analytical testing data submittal or review. In addition, Maxim did not receive a copy of any analytical testing data/reports.

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Task 2 Drilling/Oily Sludge Sample Collection

Maxim mobilized a drilling rig, equipment and crew to advance six test borings in SWMU S1 and a portable Direct Push Technology sampling rig and apparatus to advance 14 test borings.

With regard to the Direct Push Technology sampling, a two crane/operator system (as per OSHA regulations) was used for access lifts. An attempt was made to advance each test boring to a depth Below Existing Grade (BEG) of 20-feet. The actual depths attained are listed in Table 1 below. The visual characteristics of the collected material from each test boring were recorded on a test boring log (presented as an Attachment).

TABLE 1

TEST BORING DEPTHS

TEST BORING	DEPTH BEG (ft)	ADVANCEMENT TECHNIQUE	AUGER/SAMPLER REFUSAL
1-1	14.0	DP	YES
1-2	16.0	DP	YES
1-3	16.0	DP	YES
1-4	13.0	DR	YES
1-4A	20.0	DP	NO
2-1	20.0	DP	NO
2-4	19.5	DR	YES
3-1	19.5	DP	YES
3-3	20.0	DR	NO
4-1	20.0	DP	NO
4-4	20.0	DR	YES
5-4	17.0	DR	YES
5-5	20.0	DR	NO

DP = Direct Push Technology   DR = Drilling Rig w/Standard Split-spoon sampler

At each test boring location, three composite samples were collected. Two samples were for "De-oiling Potential" (DP) analyses, while the third sample was for "Hazardous Material Determination" (HMD) analyses. A summary of the collection procedure for each of the three samples is detailed below.

De-oiling Potential Samples

A Maxim environmental geologist collected two composite samples for DP purposes from each test boring advanced. Each sample consisted of the recovered materials located in the following depth ranges: 1) Surface to 1/2 Total Boring Depth (TBD); and, 2) 1/2 TBD to TBD. When advanced with a drilling rig, the augers and split-spoon samplers were decontaminated with a citrus based de-greaser and steam cleaner prior to reuse. Decontamination was not required with direct push technology as dedicated liners are used in the sampling apparatus. All DP sample containers were provided by BSC's Homer Research Laboratories (HRL).

Hazardous Material Determination Samples

After collecting the DP samples at each test boring, the remaining material was composited by the Maxim environmental geologist to form a HMD sample. Each sample consisted of the recovered materials encountered throughout the length of each test boring. The necessary equipment to facilitate containerization of these samples and proper transport to GL was supplied by GL.

Task 3 Analytical Testing

De-oiling Potential Analyses

As per Mr. Franco, this portion of the analytical testing task was completed by HRL. These samples were transported to HRL by BSC personnel.

Hazardous Material Determination Samples

Analytical testing of HMD samples was to be completed by the previously referenced BSC EA contracted GL.

The necessary equipment to facilitate containerization of the collected samples was supplied by GL. Maxim personnel packaged the samples in GL provided containers and coordinated their transport to GL via FedEx "Next Morning Delivery" parcel service. As with the previously discussed effluent water samples, Maxim was not responsible for analytical testing data submittal or review. In addition, Maxim did not receive a copy of any analytical testing data/reports.

The samples collected from each test boring along with the collection depth range are listed in Table 2 below.

TABLE 2

SAMPLES COLLECTED

TEST BORING	DP SAMPLE RANGE BEG (ft)	DP SAMPLE RANGE BEG (ft)	HMD SAMPLE RANGE BEG (ft)
1-1	0-7	7-14	0-14
1-2	0-8	8-16	0-16
1-3	0-8	8-16	0-16
1-4	0-6.5	6.5-13	0-13
1-4A	0-10	10-20	0-20
2-1	0-10	10-20	0-20
2-4	0-9.75	9.75-19.5	0-19.5
3-1	0-9.75	9.75-19.5	0-19.5
3-3	0-10	10-20	0-20
4-1	0-10	10-20	0-20
4-4	0-10	10-20	0-20
5-4	0-8.5	8.5-17	0-17
5-5	0-10	10-20	0-20

We trust that this report satisfies your current requirements. We appreciate the opportunity to complete these services for BSC EA. If you have any questions, please contact us.

Respectfully Submitted,
MAXIM TECHNOLOGIES OF NEW YORK, INC.
Jeff Contino
Jeff Contino
Environmental Geologist

bscswmu1.rpt

MAXIM
TECHNOLOGIES INC

ATTACHMENT

5167 South Park Ave. • P.O. Box 0913 • Hamburg, NY 14075 • (716) 649-8110 • Fax: (716) 649-8051

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DATE
STARTED: 5-22-00
FINISHED:

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG
20-01442

BORING NO.: 1 - 1
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N		SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1								Black-Brown Silt like material; Oily (wet)	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY S-1: Only 1.5' Recovery 1445: Collect Samples 0 -7, 7-14
	▨	2									
5	▨										
	▨	3								(Very Moist - Wet)	
10	▨									Becomes Red-Brown	
	▨	4									
	▨									Black f-c Slag (hard)	
										Boring complete at 14.0' BEG with Ref.	
15											
20											
25											

DRILLER: SLC
DRILL RIG: SIMCO EARTHPROBE 200
METHOD OF INVESTIGATION: DIRECT PUSH TECH
WEATHER: SUNNY 60 F
CLASSIFIED BY: J. CONTINO

DATE
STARTED: 5-22-00
FINISHED:

MAXIM TECHNOLOGIES INC

SUBSURFACE LOG

20-01442

BORING NO.: 1 - 2
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1							Black Silt like material; Oily (wet)	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY S-1: Only 1.5' Recovery 1320: Collect Samples
	▨	2							Becomes Brown	
5	▨									
	▨	3								
10	▨									
	▨	4							Becomes Black, (moist) hard	
15	▨								Black f-c Slag	
									Boring complete @ 16.0', BEG w/REF	
20										
25										

DRILLER: SLC
DRILL RIG: SIMCO EARTHPROBE 200
METHOD OF INVESTIGATION: DIRECT PUSH TECH
WEATHER: SUNNY 60 F
CLASSIFIED BY: J. CONTINO

DATE
STARTED: 5-22-00
FINISHED:

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG
20-01442

BORING NO.: 1 - 3
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N		SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1								Black Silt like material, Oily (moist) (6") Becomes Brown	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY S-1: Only 1.5' Recovery 1120: Collect Samples 0 - 8' 8 - 16'
	▨	2								Becomes (wet) with pockets of Oil	
5	▨										
	▨	3									
10	▨										
	▨	4								Becomes Black	
15	▨									Black and Red Seams, becomes granular (hard)	
										Boring Complete at 16.0' BEG w/REF	
20											
25											

DRILLER: SLC
DRILL RIG: SIMCO EARTHPROBE 200
METHOD OF INVESTIGATION: DIRECT PUSH TECH
WEATHER: SUNNY 60 F
CLASSIFIED BY: J. CONTINO

DATE
STARTED: 5-12-00
FINISHED:

MAXIM TECHNOLOGIES INC

SUBSURFACE LOG
20-01442

BORING NO.: 1 - 4
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0									Black Silt like material, very soft, wet	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY 0' - 2' No Recovery 2' - 4' No Recovery Refusal at 13.0' BEG 1335: Collect Samples
									Brownish Black	
	▨	1								
5	▨									
	▨	2								
	▨	3								
10	▨									
	▨	4								
	▨	5								
									Boring complete at 13.0' BEG w/REF	
15										
20										
25										

DRILLER: S. PFOUTS
DRILL RIG: CME - 850
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGER (2 1/4")
WEATHER: OVERCAST, 70 F
CLASSIFIED BY: A. NOTARO

DATE
STARTED: 5-22-00
FINISHED:

MAXIM TECHNOLOGIES INC

SUBSURFACE LOG
20-01442

BORING NO.: 1 - 4A
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N		SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1								Black Silt like, Oily (wet)	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY 0655: First Crane on site - SLC on site Jerry Jones, Greg Janik, Brock Young 0700: Calibrate PID reading 100 ppm 0705: Second Crane on site
	▨									Brown Silt like, Oily (very moist)	
	▨	2								Becomes softer	
5	▨										
	▨	3								(wet)	
10	▨									Becomes Black-Brown (very moist)	
	▨	4									
	▨									Becomes Black	
15	▨									Black-Blue f-c Sand/Gravel size slag (non-cohesive) (hard)	
	▨	5									
	▨									Becomes Red-Brown Black f-c Slag	
	▨										S-5: Only 1.25' Recovery 0955: Collect Samples 0-10' 10'-20'
20										Boring complete at 20.0' BEG	
25											

DRILLER: SLC
DRILL RIG: SIMCO EARTHPROBE 200
METHOD OF INVESTIGATION: DIRECT PUSH TECH
WEATHER: MOSTLY CLOUDY, 50 F, CALM WIND
CLASSIFIED BY: J. CONTINO

DATE
STARTED: 5-23-00
FINISHED:

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG
20-01442

BORING NO.: 2 - 1
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N		SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0		1								Black Silt like material, Oily (wet) Becomes Red-Brown	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY (PID reads 100 ppm Std) S-1: Only 1.0' Recovery 0812: Collect Samples 0 - 10' 10 - 20'
		2								Becomes Black	
5										Becomes Red Brown (less wet)	
		3									
10											
		4								Becomes Black, Pockets of Oil	
										Becomes Hard	
15										Black, Blue, Green f-c Slag 9moist)	
		5								White Yellow Slag also	
20										Boring complete at 20.0' BEG	
25											

DRILLER: SLC
DRILL RIG: SIMCO EARTHPROBE 200
METHOD OF INVESTIGATION: DIRECT PUSH TECH
WEATHER: MOSTLY SUNNY 60 F
CLASSIFIED BY: J. CONTINO

DATE
STARTED: 5-12-00
FINISHED:

MAXIM TECHNOLOGIES INC

SUBSURFACE LOG

20-01442

BORING NO.: 2 - 4
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0										Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY 0' - 2' No Recovery Refusal at 19.5' BEG PID 1.0 ppm 1115: Collect Samples
	▨	1							Black Silt like material, very moist, soft	
	▨	2							Stiff; moist	
5	▨	3							Becomes Sticky	
	▨	4								
10	▨	5								
	▨	6								
	▨	7								
15	▨	8								
	▨	9								
20									Boring complete at 19.5' BEG w/REF	
25										

DRILLER: S. PFOUTS
DRILL RIG: CME - 850
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGER (2 1/4")
WEATHER: OVERCAST, 65 F, SW WIND
CLASSIFIED BY: A. NOTARO

DATE
STARTED: 5-23-00
FINISHED:

MAXIM TECHNOLOGIES INC

SUBSURFACE LOG
20-01442

BORING NO.: 3 - 1
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N		SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1								Black Silt like material, Oily (moist-wet)	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY S-1: Only 1.0' Recovery S-2: Only 2.0' Recovery S-4: Only 1.5' Recovery
	▨	2									
5	▨									Becomes Red-Brown	
	▨	3									
10	▨										
	▨	4								Becomes Black	
15	▨										
	▨	5								Becomes Hard	1120: Collect Samples 0 - 9.75' 9.75' - 19.5'
20										Boring complete at 19.5' BEG w/REF	
25											

DRILLER: SLC
DRILL RIG: SIMCO EARTHPROBE 200
METHOD OF INVESTIGATION: DIRECT PUSH TECH
WEATHER: OVERCAST, 65 F
CLASSIFIED BY: J. CONTINO

DATE
STARTED: 5-11-00
FINISHED:

MAXIM TECHNOLOGIES INC

SUBSURFACE LOG

20-01442

BORING NO.: 3 - 3
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N		SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1								Gray Black Silty materail, very moist, very soft	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY 1335 - Having trouble with rig 1510 - Resume 1535: Collect Samples
	▨	2									
5	▨	3									
	▨	4									
	▨	5								Brown	
10	▨	6								Gray-Black, soft, moist	
	▨	7									
15	▨	8									
	▨	9									
	▨	10									
20										Boring complete at 20.0'	
25											

DRILLER: S. PFOUTS
DRILL RIG: CME - 850
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGER (2 1/4")
WEATHER: SUNNY, 65 F, SW WIND
CLASSIFIED BY: A. NOTARO

DATE
STARTED: 5-23-00
FINISHED:

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG
20-01442

BORING NO.: 4 - 1
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N		SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0		1								Black silt like material, Oily (wet) Very Soft	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY Sinking hook platform to eye hooks S-1 & S-2 only 2.0' Recovery 1010: Collect Samples 0 - 10' 10 - 20'
		2									
5										Becomes Red-Brown (less wet); harder	
		3									
10											
		4								Becomes Dark Brown	
										Becomes Black	
15											
		5									
										Black f-c Slag w/4" Tan f-c Slag Seam (dry) Very hard	
20										Boring complete at 20.0' BEG	
25											

DRILLER: SLC
DRILL RIG: SIMCO EARTHPROBE 200
METHOD OF INVESTIGATION: DIRECT PUSH TECH
WEATHER: OVERCAST, 65 F
CLASSIFIED BY: J. CONTINO

DATE
STARTED: 5-11-00
FINISHED:

MAXIM TECHNOLOGIES INC

SUBSURFACE LOG

20-01442

BORING NO.: 4 - 4
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N		SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1								Black Silty Material, very moist, soft	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY 1020 - Spoke to Nick Franco - decon spoons only between holes 0 - 2' only 8" Recovery 2 - 4' only 10" Recovery
	▨	2								Wet, very soft	
5	▨	3								very most	
	▨	4								Red-Brown	
	▨	5								Brownish Black, soft	
10	▨	6								Very soft Soft	
	▨	7								Very wet, very soft	
15	▨	8								Grayish-Brown	Refusal at 20.0' BEG
	▨	9								Brownish Black	1120 - Collect Samples
	▨	10									
20										Boring complete at 20.0' BEG w/REF	
25											

DRILLER: S. PFOUTS
DRILL RIG: CME - 850
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGER (2 1/4")
WEATHER: SUNNY, 50 F, SW WIND
CLASSIFIED BY: A. NOTARO

DATE
STARTED: 5-11-00
FINISHED:

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG

20-01442

BORING NO.: 5 - 4
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0-6	6-12	12-18	18-24	N	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0	▨	1							Black Silt like material, very soft, wet	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY Refusal at 17.0' BEG 1450: Collect Samples
	▨	2								
5	▨	3								
	▨	4								
	▨	5							Brown	
10	▨	6							Saturated	
	▨	7								
15	▨	8								
	▨	9								
									Boring complete at 17.0' BEG w/REF	
20										
25										

DRILLER: S. PFOUTS
DRILL RIG: CME - 850
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGER (2 1/4")
WEATHER: OVERCAST, 70 F
CLASSIFIED BY: A. NOTARO

DATE
STARTED: 5-12-00
FINISHED:

MAXIM
TECHNOLOGIES INC

SUBSURFACE LOG

20-01442

BORING NO.: 5 - 5
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: SWMU S1 DRILLING
CLIENT: BETHLEHEM STEEL CORP
LOCATION: LACKAWANNA FACILITY
LACKAWANNA, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER						SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
			0/6	6/12	12/18	18/24	N				
0	▨	1								Black silt like material, very moist, very soft	Samples Collected: De-Oiling a. S-1/2 TBD (Comp) b. 1/2 TBD-TBD (Comp) HMD S-TBD (Comp) TCLP - VOC, SVOC, METALS, TOTAL PCB'S IGNITABILITY REACTIVITY CORROSIVITY 14.0' - 16.0' No Recovery 0905: Collect Samples
	▨	2									
5	▨	3									
	▨	4								Brown	
	▨	5								Wet	
10	▨	6								Pockets of petroleum like substance	
	▨	7									
15	▮										
	▨	8									
	▨	9								Grayish Black, soft Stiff	
20										Boring complete at 20.0'	
25											

DRILLER: S. PFOUTS
DRILL RIG: CME - 850
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGER (2 1/4")
WEATHER: OVERCAST, 70 F
CLASSIFIED BY: A. NOTARO

LOG OF BORING

PROJECT Bethlehem Steel Corporation	PROJECT NUMBER 00120-173-152	SHEET NO. 1 of 1	HOLE NUMBER SWMU-S1-1

SITE Lackawanna, NY	COORDINATES S66+00.00 / W32+60.00	LOGGED BY K. Ignaszak	CHECKED BY L. Keefe

BEGUN 6-01-94	COMPLETED 6-01-94	DRILLER Empire Soils/Ron Brown	DRILLING EQUIPMENT CME 850, 2-1/4" H.S. Augers	BORING DIA. 4"	TOTAL DEPTH 24

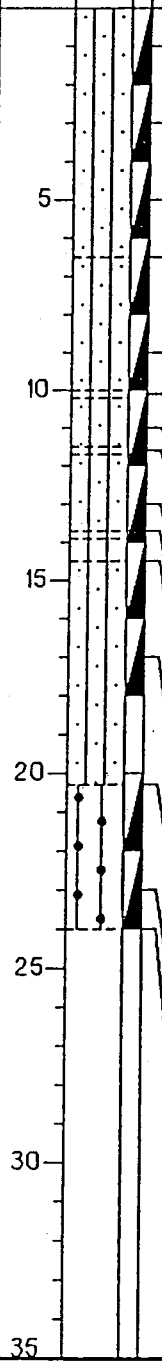
CORE RECOVERY (FT./%) /	CORE BOXES	SAMPLES 11	CASING STICKUP None	GROUND ELEV. 625 Plant	DEPTH/*ELEV.* GROUND WATER ▽ 50.5 / *574.5* ▼ 50.5 / *574.5*	DEPTH/*ELEV.* TOP OF ROCK 83 / *542.0*

SAMPLE TYPE 2" x 2' Standard Split Spoon	CASING DIA/LENGTH None	NOTES HNu background reading = 0.7ppm

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)
1	24/0	WOH	NA
2	24/24	WOH	2.1
3	24/12	WOH	4.0
4	24/24	WOH	9.1
5	24/24	WOH	7.1
6	24/24	WOH	7.0
7	24/24	WOH	7.0
8	24/24	2	7.3
9	24/24	3	7.5
10	24/12	23	32
11	24/8	28	22

LAYER *Elev.* Depth

618.5	6.5
615.0 [illegible]	10.2
613.5 [illegible]	11.7
611.3 [illegible]	13.7
610.5	14.5
604.7	20.3
601.0	24.0



DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor

- No recovery
- DARK GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL] (high oil content with a strong petro odor)
- DARK GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL] (high oil content with a strong petro odor)
- YELLOWISH RED FINE GRAINED SILTY SAND (moist) (soft) [FILL] (strong organic/petro odor)
- DARK GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL] (high oil content with a strong petro odor)
- DARK GRAY SANDY SILT (moist) (soft to medium stiff) [FILL]
- YELLOWISH RED FINE GRAINED SILTY SAND (moist) (soft) [FILL] (strong organic/petro odor)
- DARK GRAY SANDY SILT (moist) (medium stiff) [FILL]
- YELLOWISH RED FINE GRAINED SILTY SAND (wet) soft) [FILL] (strong- organic/petro odor)
- DARK GRAY SANDY SILT (moist) (medium stiff) [FILL]
- YELLOWISH RED TO BROWN FINE TO MEDIUM GRAINED SITLY SAND (moist) (soft to medium stiff) [FILL] (strong petro/organic odor)
- GRADES TO BROWN AND DARK GRAY FINE TO MEDIUM GRAINED SILTY SAND (moist) (soft to medium stiff) [FILL] (petro/organic odor)
- DARK GRAY FINE TO MEDIUM GRADED GRAVEL with DARK GRAY FINE GRAINED SILTY SAND (dry) (loose to medium dense) [FILL] (slag fragments) (strong petro/organic odor)
- DARK GRAY FINE TO MEDIUM GRADED GRAVEL with DARK GRAY FINE GRAINED SILTY SAND (dry) (loose to medium dense) [FILL] (slag fragments) (strong petro/organic odor)
- End SWMU-S1-1, sampled to 24 ft, augered to 20 ft @ 14:53 on 6/01/94.

DRILLING NOTES water levels, water return, character of drilling, etc.

Note: WOH = weight of hammer

Driller augered too far from 18 ft to 19.5 ft, instructed to auger to 20 ft and resume sampling.

Dames & Moore

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-173-152 JOB NAME : BSC PHASE II B DATE : 6/1/94

JOB LOCATION : LACKAWANNA, NY TIME : 1700

14:18 (VOC)

SAMPLE ID : SWMU-S1-1

SAMPLE LOCATION : SWMU-S1

SAMPLERS : K. IGNASZAK OF : DAMES & MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐ STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

SAMPLE TYPE : POINT ☐ GRAB ☒ VOC'S ONLY COMPOSITE ☒ ALL OTHERS

SAMPLE DESCRIPTION : DARK GRAY ~~BLACK~~ AND BROWN FINE GRAINED SILTY SAND (MOIST) (SOFT) [FILL] (STRONG PETRO ORGANIC ODOR)

SAMPLE ANALYSIS

SAMPLE ID : SWMU-S1-1 (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR : VOC, BNA, METALS, CN (ALL TCLP, SLP, TCA)

PHYSICAL APPEARANCE & ODOR : SEE ABOVE

FIELD TEST :	VALUE :
TEMP. (°C/°F)	NA
pH	
SPEC. COND. (μMHOs/CM)	
OTHER (UNITS)	H·NU = 9.1 PPM (6'-8')

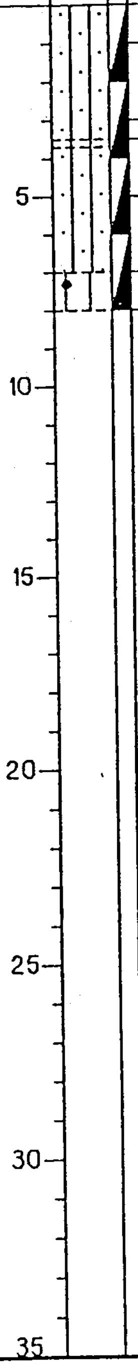
WEATHER : OVERCAST, MOD. WIND, 50°

COMMENTS : VOC SAMPLES GRABBED FROM 6'-8' TOTAL=3
ALL OTHERS COMPOSITED FROM 0'-24' TOTAL=9

LOG OF BORING

PROJECT Bethlehem Steel Corporation	PROJECT NUMBER 00120-173-152	SHEET NO. 1 of 1	HOLE NUMBER SWMU-S1-2	
SITE ckawanna, NY	COORDINATES S66+70 / W33+90	LOGGED BY K. Ignaszak	CHECKED BY L. Keefe	
UN 6-02-94	COMPLETED 6-02-94	DRILLER Empire Soils/Ron Brown	DRILLING EQUIPMENT CME 850, 2-1/4" H.S. Augers	BORING DIA. 4"
TOTAL DEPTH 8	CORE RECOVERY (FT./%) /	CORE BOXES	SAMPLES 4	CASING STICKUP None
GROUND ELEV. 624 Plant	DEPTH/*ELEV.* GROUND WATER ▽ 49.5 / *574.5* ▼ 49.5 / *574.5*	DEPTH/*ELEV.* TOP OF ROCK 82 / *542.0*	SAMPLE TYPE 2" x 2' Standard Split Spoon	CASING DIA/LENGTH None
NOTES HNu background reading = 0.8ppm				

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth
1	24/0	WOH	NA	
2	24/22	WOH	5.2	*620.5* *620.3* 3.5 3.7
3	24/24	WOH	6.4	
4	24/12	22	1.6	*617.0* 7.0 *616.0* 8.0



DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor

No recovery

DARK GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL] (strong organic/petro odor)

YELLOWISH RED FINE GRAINED SILTY SAND (moist) (soft) [FILL] (petro odor)

YELLOWISH RED GRADING TO DARK GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL] (strong organic/petro odor)

DARK GRAY TO GRAY FINE GRADED GRAVEL with DARK GRAY FINE TO MEDIUM GRAINED SILTY SAND (dry) (medium dense) [FILL] (slag fragments with strong organic/petro odor)

End SWMU-S1-2 @ 8 ft. Sampled to 8 ft and augered to 5 ft @ 09:03 on 6/02/94.

DRILLING NOTES water levels, water return, character of drilling, etc.

Note: WOH = weight of hammer

Dames & Moore

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-173-152 JOB NAME : BSC PHASE IIB DATE : 6/2/94

JOB LOCATION : LACKAWANNA, NY TIME : 10:30

0902 (VOCs)

SAMPLE ID : SWMU-S1-2

SAMPLE LOCATION : SWMU-S1

SAMPLERS : K. IGNASZAK OF : DAMES & MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐ STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

SAMPLE TYPE : POINT ☐ GRAB ☒ VOC'S ONLY COMPOSITE ☒ ALL OTHERS

SAMPLE DESCRIPTION : DARK GRAY AND BROWN FINE GRAINED SILTY SAND (MOIST) (SOFT) [FILL] (STRONG PETRO ORGANIC ODOR)

SAMPLE ANALYSIS

SAMPLE ID : SWMU-S1-2 (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR : VOC, BNA, METALS, CN (ALL TCLP, SLP, TCA)

PHYSICAL APPEARANCE & ODOR : SEE ABOVE

FIELD TEST : VALUE :

TEMP. (°C/°F)

pH NA

SPEC. COND.(μMHOs/CM)

OTHER (UNITS) H·Nu = 6.4 ppm (4'-6')

WEATHER : CLEAR, MOD WIND, 50°

COMMENTS : VOC SAMPLES GRABBED FROM 4'-6' TOTAL = 3 ALL OTHERS COMPOSITED FROM 0-8' TOTAL = 9

⑫

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-~~173~~ 186 -152 JOB NAME : BSC PHASE II-C DATE : 2/9/95
JOB LOCATION : LACKAWANNA, NY TIME : 11 : 15

SAMPLE ID : S-1-1(0-6)
SAMPLE LOCATION : SWMU S1-1 EAST

SAMPLERS : Mike Parish OF : DAMES + MOORE
Brad Phillips " "

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☐ HAND AUGER ☐ SPOON/TROWER ☒

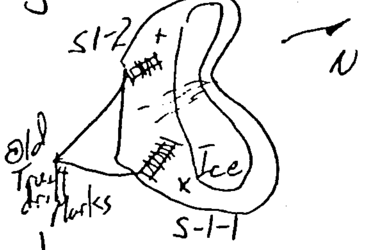
SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : Black clay to silt sized material, stiff, strong coke odor. Frozen

SAMPLE ANALYSIS

SAMPLE ID : S1-1-(0-6) (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS
ALL TOTAL CONSTITUENT, TCLP + SPLP ANALYSES
PHYSICAL APPEARANCE & ODOR : Black, stiff, strong coke odor

FIELD TEST : VALUE :
TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS)



WEATHER : 20°F 20-30 mph wind, -cold, overcast
COMMENTS :

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-~~173~~ 186-152 JOB NAME : BSC PHASE II-C DATE : 2/9/95
JOB LOCATION : LACKAWANNA, NY TIME : 11 : 30

SAMPLE ID : S-1-2 (0-6)
SAMPLE LOCATION : SWMU S1-2 WEST

SAMPLERS : Mike Parish OF : DAMES & MOORE
Brad Phillips " "

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☐ HAND AUGER ☐ [✓ SPOON]/TROWER ☒

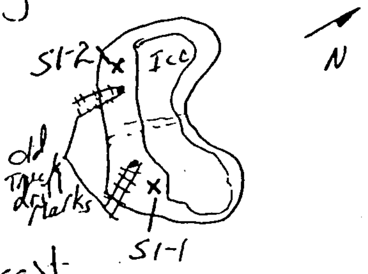
SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : Black clay to silt sized material, stiff, strong coke odor. Frozen

SAMPLE ANALYSIS

SAMPLE ID : S1-2-(0-6) (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS ALL TOTAL CONSTITUENT, TCLP + SRLP ANALYSES
PHYSICAL APPEARANCE & ODOR : black, stiff, strong coke odor

FIELD TEST : VALUE :
TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS)



WEATHER : 20°F, 20-30 mph winds, cold, overcast
COMMENTS :

LOG OF BORING

PROJECT Bethlehem Steel Corporation
PROJECT NUMBER 00120-173-152
SHEET NO. 1 of 1
HOLE NUMBER SWMU-S2

SITE Lackawanna, NY.
COORDINATES S63+80 / W34+30
LOGGED BY K. Ignaszak
CHECKED BY L. Keefe

BEGUN 8-02-94
COMPLETED 8-02-94
DRILLER Empire Soils/Ron Brown
DRILLING EQUIPMENT CME-850, 2-1/4" H.S. Augers
BORING DIA. 4"
TOTAL DEPTH 28

CORE RECOVERY (FT./%) /
CORE BOXES
SAMPLES 13
CASING STICKUP None
GROUND ELEV. 621 Plant
DEPTH/*ELEV.* GROUND WATER ▽ 48.5 / *574.5* ▼ 48.5 / *574.5*
DEPTH/*ELEV.* TOP OF ROCK 79 / *542.0*

SAMPLE TYPE 2" x 2' Standard Split Spoon
CASING DIA/LENGTH None
NOTES HNu background reading = 0.8ppm

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
1	24/18	WOH	0.8		BROWNISH YELLOW TO YELLOWISH RED FINE GRAINED SILTY SAND (moist) (soft) [FILL]	
2	24/24	2	0.8	*618.7* *618.2* 2.8	STRATIFIED LAYERS OF DARK BROWN 6" IN THICKNESS, GRADES BACK TO YELLOWISH RED FINE GRAINED SILTY SAND (moist) (soft) [FILL]	Note: WOH = weight of hammer
3	24/24	WOH	1.2		GRADES TO DARK GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL]	
4	24/12	WOH	1.3	*614.0* 7.0	MOTTLED YELLOWISH RED AND DARK GRAY WITH GREENISH GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL]	
5	24/24	WOH	1.3		GRADES TO DARK GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL] (strong petro odor)	
6	24/24	2	0.9	*610.0* 11.0	DARK GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL] (strong petro odor) GRADES TO DARK BROWN FINE GRAINED SILTY SAND (moist) (soft) [FILL]	
7	24/24	2	1.4	*608.0* 13.0	GRADES TO DARK GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL] (strong petro odor)	
8	24/24	WOH	1.3		DARK GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL] (strong petro odor)	
9	24/24	1	1.2		GRADES TO DARK GRAY FINE GRAINED SILTY SAND AND SILT (moist) (soft) [FILL] (strong petro odor)	
10	24/24	WOH	1.1		DARK GRAY FINE GRAINED SILTY SAND AND SILT (moist) (soft) [FILL] (strong petro odor)	Sheen on splitspoon body, material grading to wet.
11	24/24	WOH	1.1		DARK GRAY FINE GRAINED SILTY SAND AND SILT (moist) (soft) [FILL] (strong petro odor)	
12	24/24	WOH	1.1		DARK GRAY FINE GRAINED SILTY SAND AND SILT (moist) (soft) [FILL] (strong petro odor)	
13	24/24	10	1.3	*596.0* 25.0 *595.0* 26.0	DARK GRAY FINE GRADED GRAVEL AND FINE GRAINED SILTY SAND (dry) (dense) [FILL] (strong petro odor)	
					End SWMU-S2 @ 26 ft, sampled to 26 ft and augered to 24 ft, completed @ 14:15 on 8/02/94.	

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-173-152 JOB NAME : BSC PHASE IIB DATE : 6/2/94
JOB LOCATION : LACKAWANNA, NY TIME : 15:30
13:07 (VOC

SAMPLE ID : SWMU-S2
SAMPLE LOCATION : SWMU-S2

SAMPLERS : K IGNASZAK OF : DAMES & MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☑
VOC's ONLY ALL OTHERS

SAMPLE DESCRIPTION : DARK GRAY FINE GRAINED SILTY SAND WITH SILT (MOIST) (SOFT) [FILL] (PETRO ODOR)

SAMPLE ANALYSIS

SAMPLE ID : SWMU-S2 (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, CN (ALL TCLP, SLP, TCA)
PHYSICAL APPEARANCE & ODOR : SEE ABOVE

FIELD TEST : VALUE :
TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS) H·NU = 1.4 PPM (12-14')

WEATHER : OVERCAST, STRONG WIND, 50°
COMMENTS : VOC SAMPLES GRABBED FROM 12'-14' TOTAL=3
ALL OTHERS COMPOSITED FROM 0'-26' TOTAL=9
(12)

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120 - ~~123~~ 186 - 152 JOB NAME : BSC PHASE II-C DATE : 2/9/95
JOB LOCATION : LACKAWANNA, NY TIME : 12:45

SAMPLE ID : S2-1-(0-6)
SAMPLE LOCATION : SWMU S2-1 EAST

SAMPLERS : Mike Parish OF : DAMES + MOORE
Brad Phillips " "

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

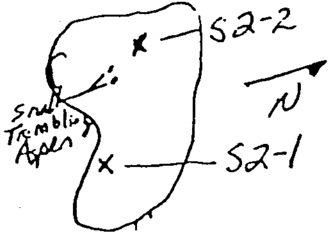
SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☐ HAND AUGER ☐ [✓ SPOON]/TROWER ☒

SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : Red brown SILT and f-m SAND (dry)
Frozen

SAMPLE ANALYSIS

SAMPLE ID : S2-1-(0-6) (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS
ALL TOTAL CONSTITUENT, TCLP + SRLP ANALYSES
PHYSICAL APPEARANCE & ODOR : red brown silty SAND no odor



FIELD TEST : VALUE :
TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS)

WEATHER : 20°F strong winds
COMMENTS : used pick to break up material

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-~~173~~ 186-152 JOB NAME : BSC PHASE II-C DATE : 2/9/95
JOB LOCATION : LACKAWANNA, NY TIME : 13:00

SAMPLE ID : S2-2-(0-6)
SAMPLE LOCATION : SWMU S2-2 WEST

SAMPLERS : Mike Parish OF : DAMES + MOORE
Brad Phillips " "

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☐ HAND AUGER ☐ [✓ SPOON]/TROWER ☒

SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : Red brown silt and fine-med SAND
Frozen

SAMPLE ANALYSIS

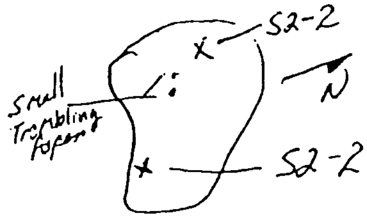
SAMPLE ID : S2-2-(0-6) (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS
ALL TOTAL CONSTITUENT, TCLP + SPLP ANALYSES

PHYSICAL APPEARANCE & ODOR : Red brown color, no odor

FIELD TEST : VALUE :

TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS)



WEATHER : 20°F, strong gusts

COMMENTS : Used pick to break up material

LOG OF BORING

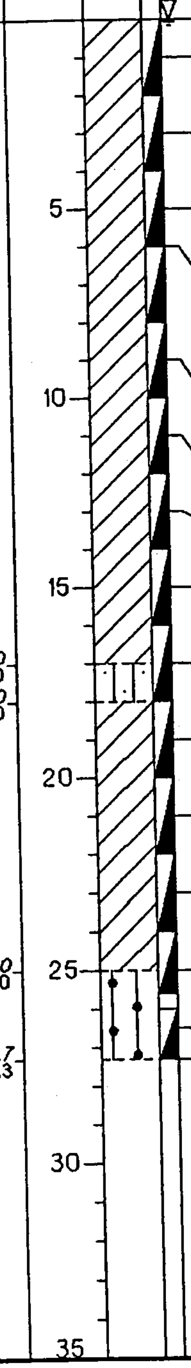
PROJECT BSC Phase II-C	PROJECT NUMBER 00120-186-152	SHEET NO. 1 of 1	HOLE NUMBER SWMU S2-3

TE ackawanna, N.Y.	COORDINATES S62+80 / W34+20	LOGGED BY E. Fujita	CHECKED BY E. Fujita

BEGUN 2/24/95	COMPLETED 2/24/95	DRILLER S. Wolkiewicz/Huntingdon	DRILLING EQUIPMENT CME 850, 4-1/4" H.S. Augers	BORING DIA. 8"	TOTAL DEPTH 27.3

CORE RECOVERY (FT./%) /	CORE BOXES	SAMPLES 14	CASING STICKUP None	GROUND ELEV. 622 Plant	DEPTH/*ELEV.* GROUND WATER ▽ / *622.0* ▼ / *622.0*	DEPTH/*ELEV.* TOP OF ROCK / *622.0*

SAMPLE TYPE 2" x 2' Standard Split Spoon	CASING DIA/LENGTH	NOTES Units = **Feet** HNu bkg = 0.4 ppm



SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
1	24/18	WOH	1.2		REDDISH-BROWN FINE SILTY SAND AND SILTY CLAY with black and orange seams (moist) (very soft) [FILL]	Note: WOH = weight of hammer
2	24/8	2	0.4		REDDISH-BROWN FINE SILTY SAND AND SILTY CLAY with black and orange seams (moist) (very soft) [FILL]	Petrol odor
3	24/24	2	0.4		REDDISH-BROWN FINE SITLY SAND AND SILTY CLAY with black seams (moist) (very soft) [FILL]	Petrol odor
4	24/24	2	0.5		REDDISH-BROWN FINE SILTY SAND AND SILTY CLAY with black seams (moist) (very soft) [FILL] GRADES TO BROWN SILTY CLAY with thin black seams (moist) (very soft) [FILL]	
5	24/24	1	0.4		GRADES TO BROWN SILTY CLAY with more abundant black zones (dry) (very soft) [FILL]	Petrol odor
6	24/20	WOH	1.0		GRADES TO BROWN SILTY CLAY with more abundant black zones (moist) (very soft)	
7	24/24	1	1.0		GRADES TO BLACK-BROWN SILTY CLAY (moist) (very soft) [FILL]	Petrol odor
8	24/24	1	1.3		BLACK-BROWN SILTY CLAY (moist) (very soft) [FILL]	Strong petrol odor
9	24/24	13	1.6	*605.0* 17.0 *604.0* 18.0	GRADES TO DARK BROWN FINE SAND with few coarse sand (wet) (medium dense) [FILL]	Strong petrol odor
10	24/16	2	1.2		BLACK-BROWN SILTY CLAY (moist) (medium dense) [FILL]	Petrol odor and sheen
11	24/0	2	NA		No recovery	
12	24/24	3	1.0		BLACK-BROWN SILTY CLAY (wet) (very soft) [FILL]	Petrol odor and sheen
13	19/15	58	0.8	*597.0* 25.0	GRADES TO BROWN FINE SILTY SAND AND DARK GRAY FINE SILTY SAND COARSE SAND (dry) (very dense) [FILL]	
14	16/4	175/.8	1.2	*594.7* 27.3	DARK BROWN AND DARK GRAY FINE SILTY SAND with few coarse sands (dry) (very dense) [FILL]	
					End SWMU S2-3 @ 27.3 feet, sampled to 27.3 ft and augered to 28 ft, @ 11:30 on 02/24/95.	

Dames & Moore

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-186-152 JOB NAME : BSC PHASE II-C DATE : 2/24/95
JOB LOCATION : LACKAWANNA, NY TIME : 14 : 30

SAMPLE ID : S2-3-(0-27.3)
SAMPLE LOCATION : SWMU S2

VOC SAMPLE ID:
S2-3-(16-18)
2-24-95
1026

SAMPLERS : E. FUJITA OF : DAMES + MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

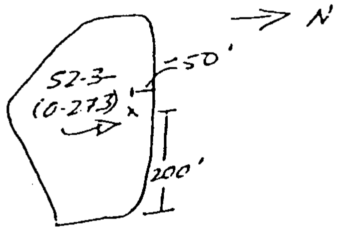
SAMPLE TYPE : POINT ☐ GRAB ☒ VOC Analysis only COMPOSITE ☒ All Non-VOC Analyses

SAMPLE DESCRIPTION : BROWN SILTY CLAY with thin black seams (moist) (very soft) AND DARK BROWN FINE SILTY SAND few coarse sands (wet) (medium dense) petrol. odor and sheen observed.

SAMPLE ANALYSIS

SAMPLE ID : S2-3-(0-27.3) + S2-3-(16-18) (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS ALL TOTAL CONSTITUENT, TCLP + SPLP ANALYSES
PHYSICAL APPEARANCE & ODOR : sheen, petrol. odor

FIELD TEST : VALUE :
TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS) HEADSPACE 11.7eV HNu 0.4 - 1.6 PPM



WEATHER : SUNNY, MID-70'S, MODERATE WEST WIND
COMMENTS : MAX. HEAD SPACE READING FROM SAMPLE OBTAINED FROM 16-18 FEET, OF 1.6 PPM.

LOG OF BORING

PROJECT: Bethlehem Steel Corporation
PROJECT NUMBER: 00120-173-162
SHEET NO.: 1 of 2
HOLE NUMBER: SWMU-S4

SITE: Lackawanna, NY
COORDINATES: S55+20 / W32+80
LOGGED BY: K. Ignaszak
CHECKED BY: L. Keefe

BEGUN: 6-03-94
COMPLETED: 6-03-94
DRILLER: Empire Soils/Ron Brown
DRILLING EQUIPMENT: CME 850, 2-1/4" H.S. Augers
BORING DIA.: 4"
TOTAL DEPTH: 36

CORE RECOVERY (FT./%): /
CORE BOXES:
SAMPLES: 18
CASING STICKUP: None
GROUND ELEV.: 613 Plant
DEPTH/*ELEV.* GROUND WATER: 38.5 / *574.5*
38.5 / *574.5*
DEPTH/*ELEV.* TOP OF ROCK: 83 / *530.0*

SAMPLE TYPE: 2" x 2' Standard Split Spoon
CASING DIA/LENGTH: None
NOTES: HNu background reading = 1.2ppm

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DEPTH	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
1	24/24	1	0.4			DARK BROWN SANDY SILT AND FINE GRAINED SILTY SAND (moist) (soft) [FILL] (topsoil like appearance and odor)	Note: WOH = weight of hammer
2	24/24	WOH	0.2			DARK BROWN SANDY SILT AND FINE GRAINED SILTY SAND (moist) (soft) [FILL] (topsoil like appearance and odor)	
3	24/18	WOH	0.3		5	DARK BROWN SANDY SILT AND FINE GRAINED SILTY SAND (moist) (soft) [FILL] (topsoil like appearance and odor)	
4	24/24	WOH	0.4	*606.0* 7.0		GRADES TO DARK GRAY SANDY SILT with fine grained silty sand (moist) (soft) [FILL] (coke like odor)	
5	24/24	WOH	1			DARK GRAY SANDY SILT with fine grained silty sand (moist) (soft) [FILL] (coke like odor)	
					10		
6	24/24	WOH	1			DARK GRAY SANDY SILT with fine grained silty sand (moist) (soft) [FILL] (coke like odor)	
7	24/24	WOH	1.4	*599.5* 13.5		GRADES TO DARK GRAY FINE GRAINED SILTY SAND with sandy silt (moist) (soft) [FILL] (coke like odor)	
8	24/24	2	1.2		15	DARK GRAY FINE GRAINED SILTY SAND with sandy silt (moist) (soft) [FILL] (coke like odor)	
9	24/24	WOH	1			DARK GRAY FINE GRAINED SILTY SAND with sandy silt (moist) (soft) [FILL] (coke like odor)	
10	24/24	WOH	3.2	*594.0* 19.0		GRADING TO DARK BROWN SANDY SILT AND FINE GRAINED SILTY SAND (moist) (soft) [FILL] (slight coke odor)	
					20		
11	24/24	WOH	4.2	*592.0* 21.0		GRADES TO DARK GRAY FINE GRAINED SILTY SAND with sandy silt (moist) (soft) [FILL] (strong coke odor)	
12	24/24	WOH	13			DARK GRAY FINE GRAINED SILTY SAND with sandy silt (moist) (soft) [FILL] (strong coke odor)	
13	24/24	2	8.2		25	DARK GRAY FINE GRAINED SILTY SAND with sandy silt (moist) (soft) [FILL] (strong coke odor)	
14	- 24/12	WOH	4			DARK GRAY FINE GRAINED SILTY SAND with sandy silt (moist) (soft) [FILL] (strong coke odor), TRACES OF DARK GRAY FINE GRAVEL EVIDENT (slag fragments) @ 28.5 feet	
15	24/12	WOH	4			DARK GRAY TO DARK BROWN FINE GRAINED SILTY SAND with sandy silt and a trace of fine graded gravel (moist) (soft) [FILL] (slag fragments with a strong coke odor)	
				583.0 30.0	30		
16	24/24	WOH	8.1			GRAY TO DARK GRAY SILTY CLAY WITH FINE GRAINED SILTY SAND AND A TRACE OF FINE ROUNDED GRAVEL (moist) (soft) [FILL] (strong coke odor)	
17	24/24	8	7.1	*580.0* 33.0		DARK GRAY FINE GRAINED SILTY SAND (moist) (loose) [FILL] (cinder like appearance with a strong coke odor)	
18	24/10	13	3.2		35		

Dames & Moore

LOG OF BORING	PROJECT Bethlehem Steel Corporation	PROJECT NUMBER 00120-173-162	SHEET NO. 2 of 2	HOLE NUMBE SWMU-

continuation

SAMPLE NUMBER	LENGTH/RECOV. (Inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTE wate water character or dri etc.
				577.5 *[illegible]* 38.0				DARK GRAY TO GRAY FINE GRADED GRAVEL (moist) (medium dense) [FILL] (slag fragments with a strong coke odor) End of SWMU-S4 @ 38 ft, sampled to 38 ft and augered to 34 ft @ 10:15 on 8/03/94.	
					40 45 50 55 60 65 70 75				

Dames & Moore

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-173-152 JOB NAME : BSC-PHASE-IIB DATE : 6/5/94
TIME : 11:30
0933 (VOCs)
JOB LOCATION : LACKAWANNA, NY

SAMPLE ID : SWMU-S4
SAMPLE LOCATION : SWMU-S4

SAMPLERS : K. IGNASZAK OF : DAMES & MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐ STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

SAMPLE TYPE : POINT ☐ GRAB ☒ VOC's ONLY COMPOSITE ☒ ALL OTHERS

SAMPLE DESCRIPTION : DARK GRAY FINE GRAINED SILTY SAND WITH SANDY SILT AND FINE GRADED GRAVEL (MOIST) (SOFT) [FILL] (STRONG COKE ODOR)

SAMPLE ANALYSIS

SAMPLE ID : SWMU-S4 (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, CN (ALL SLP, TCA)
PHYSICAL APPEARANCE & ODOR : SEE ABOVE

FIELD TEST : VALUE :

TEMP. (°C/°F)
pH
SPEC. COND. (μMHOs/CM)
OTHER (UNITS) HNU = 13.0 ppm (22-24')

WEATHER : CALM, SUNNY, 70°
COMMENTS : VOC SAMPLES GRABBED FROM 22-24' TOTAL = 2
ALL OTHERS COMPOSITED FROM 0'-36' TOTAL = 6

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-186-152 JOB NAME : BSC PHASE II-C DATE : 2/10/95
JOB LOCATION : LACKAWANNA, NY TIME : 11:00

SAMPLE ID : S4-1-(0-6)
SAMPLE LOCATION : SWMU S-4-1 EAST

SAMPLERS : Mike Parish OF : DAMES + MOORE
Brad Phillips " "

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐ STANDARD SPLIT SPOON ☐ HAND AUGER ☐ SPOON/TROWER ☑

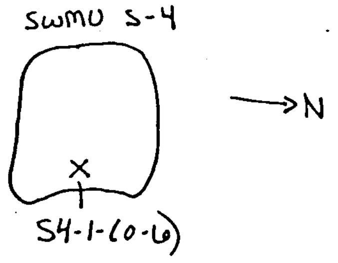
SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : Brown SILT, trace to some CLAY and fine SAND, roots (moist),

SAMPLE ANALYSIS

SAMPLE ID : S4-1-(0-6) (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS ALL TOTAL CONSTITUENT, TCLP + SRLP ANALYSES
PHYSICAL APPEARANCE & ODOR : topsoil, no odor

FIELD TEST : VALUE :
TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS)



WEATHER : ~25°F, windy, overcast
COMMENTS :

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-~~182~~ 186-152 JOB NAME : BSC PHASE II-C DATE : 2/10/95

JOB LOCATION : LACKAWANNA, NY TIME : 11 : 15

SAMPLE ID : S4-2-(0-6)

SAMPLE LOCATION : SWMU S-4-2 CENTER

SAMPLERS : Mike Parish OF : DAMES + MOORE

Brad Phillips

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐ STANDARD SPLIT SPOON ☐ HAND AUGER ☐ SPOON/TROWER ☑

SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : Brown SILT, tr. to some CLAY and fine SAND, roots (moist)

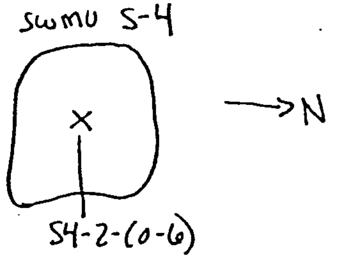
SAMPLE ANALYSIS

SAMPLE ID : S4-2-(0-6) (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS ALL TOTAL CONSTITUENT, TCLP + SPLP ANALYSES

PHYSICAL APPEARANCE & ODOR : topsoil, no odor

FIELD TEST :	VALUE :
TEMP. (°C/°F)	NA
pH	
SPEC. COND.(μMHOs/CM)	
OTHER (UNITS)	



WEATHER : ~25°F, windy, overcast

COMMENTS :

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-~~175~~ 186-152 JOB NAME : BSC PHASE II-C DATE : 2/10/95
JOB LOCATION : LACKAWANNA, NY TIME : 11:30

SAMPLE ID : S4-3-(0-6)
SAMPLE LOCATION : SWMU S-4-3 WEST

SAMPLERS :	Mike Parish	OF :	DAMES + MOORE
	Brad Phillips		" "

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐ STANDARD SPLIT SPOON ☐ HAND AUGER ☐ SPOON/TROWER ☑

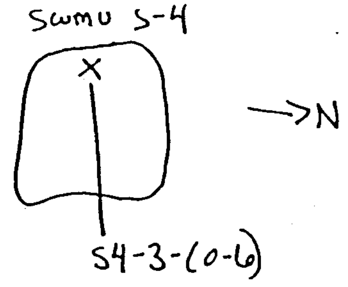
SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : Brown SILT, tr. to some CLAY and fine SAND, roots (moist)

SAMPLE ANALYSIS

SAMPLE ID : S4-3-(0-6) (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS ALL TOTAL CONSTITUENT, TCLP + SRLP ANALYSES
PHYSICAL APPEARANCE & ODOR : topsoil, no odor

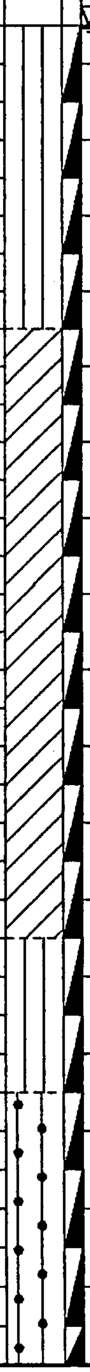
FIELD TEST :	VALUE :
TEMP. (°C/°F)	NA
pH	
SPEC. COND.(μMHOs/CM)	
OTHER (UNITS)	



WEATHER : ≈25°F, windy, overcast
COMMENTS :

LOG OF BORING

PROJECT BSC Phase II-C	PROJECT NUMBER 00120-186-152	SHEET NO. 1 of 2	HOLE NUMBER **SWMU S4-4**	
SITE Lackawanna, N.Y.	COORDINATES S55+75 / W32+35	LOGGED BY E. Fujita	CHECKED BY E. Fujita	
BEGUN 2/27/95	COMPLETED 2/27/95	DRILLER B.Levergood/Huntingdon	DRILLING EQUIPMENT CME 850, 4-1/4" H.S. Augers	BORING DIA. 8"
TOTAL DEPTH 36	CORE RECOVERY (FT./%) /	CORE BOXES	SAMPLES 19	CASING STICKUP None
GROUND ELEV. 614 Plant	DEPTH/*ELEV.* GROUND WATER ▽ / 614.0 ▼ / 614.0	DEPTH/*ELEV.* TOP OF ROCK / 614.0		
SAMPLE TYPE 2" x 2' Standard Split Spoon	CASING DIA/LENGTH	NOTES Units = **Feet** HNu bkg = 0.6 ppm		



SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DEPTH	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
1	24/24	WOH	1.0			BROWN CLAYEY SILT with a trace of roots (moist) (very soft) [FILL]	Note: WOH = weight of hammer
2	24/24	WOH	1.2			BROWN CLAYEY SILT with a trace of roots and brown fine silt partings (moist) (very soft) [FILL]	
3	24/6	1	0.6		5	BROWN CLAYEY SILT with a trace of roots and brown fine silt partings (moist) (very soft) [FILL]	
4	24/24	3	1.0	*606.0* 8.0		BROWN CLAYEY SILT with a trace of roots and brown fine silt partings (moist) (very soft) [FILL]	Slight petrol odor
5	24/24	WOH	1.2		10	BROWN SILTY CLAY (moist) (very soft) [FILL]	
6	24/24	WOH	1.6			BROWN SILTY CLAY (moist) (very soft) [FILL]	Strong petrol odor
7	24/24	WOH	1.4			BROWN SILTY CLAY (moist) (very soft) [FILL]	Strong petrol odor
8	24/24	WOH	1.3		15	DARK BROWN SILTY CLAY and red-brown fine sand zones (moist) (very soft) [FILL]	
9	24/21	WOH	1.7			DARK BROWN SILTY CLAY AND CLAYEY SILT (moist) (very soft) [FILL]	
10	24/24	WOH	1.8		20	RED-BROWN AND TAN SILTY CLAY with some brown silt (moist) (very soft) [FILL]	
11	24/24	WOH	2.0			RED-BROWN AND DARK GRAY MOTTLED SILTY CLAY (moist) (very soft) [FILL]	Slight petrol odor
12	24/24	WOH	0.8	*590.0* 24.0		RED-BROWN AND DARK GRAY MOTTLED SILTY CLAY with some dark gray fine silt seams (moist) (very soft) [FILL]	
13	24/24	WOH	1.0		25	DARK GRAY CLAYEY SILT (moist) (very soft) [FILL]	Strong petrol odor
14	24/24	1	1.3	*586.0* 28.0		DARK GRAY CLAYEY SILT with some dark brown clayey silt and dark gray fine sand seams (moist) (very soft) [FILL]	Strong petrol odor and sheen
15	24/24	WOH	1.2		30	DARK GRAY AND DARK BROWN SILTY CLAY (moist) (very soft) [FILL]	Strong petrol odor and sheen
16	24/24	WOH	1.8			DARK GRAY AND DARK BROWN SILTY CLAY (moist) (very soft) [FILL]	
17	24/12	6	1.2			DARK GRAY AND DARK BROWN SILTY CLAY (moist) (very soft) [FILL]	
					35		

LOG OF BORING	PROJECT BSC Phase II-C	PROJECT NUMBER 00120-186-152	SHEET NO. 2 of 2	HOLE NUMBER **SWMU S4-4**

continuation

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
18	24/24	30	1.0	*578.0* 36.0				DARK GRAY AND DARK BROWN SILTY CLAY GRADES TO BLACK FINE SILTY SAND some coarse gray gravel (dry) (dense) [FILL] End SWMU S4-4 @ 38 feet, sampled to 38 ft and augered to 34 ft, @ 17:00 on 02/27/95.	
					40				
					45				
					50				
					55				
					60				
					65				
					70				
					75				

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-186-152 JOB NAME : BSC PHASE II-C DATE : 2/27/95
JOB LOCATION : LACKAWANNA, NY TIME : 17:15

VOC SAMPLE ID:
S4-4-(20-22)
2/27/95
1555

SAMPLE ID : S4-4-(0-36)
SAMPLE LOCATION : SWMU S4
EAST BORING

SAMPLERS : E. FUJITA OF : DAMES & MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

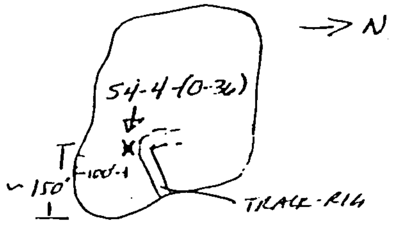
SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☒
VOC Analysis only All Non-VOC Analyses

SAMPLE DESCRIPTION : DARK BROWN SILTY CLAY (moist) (very soft) slight petrol/tar odor AND RED-BROWN AND TAN SILTY CLAY, some brown silt, (moist) (very soft) petrol/tar odor.

SAMPLE ANALYSIS

SAMPLE ID : S4-4(0-36) + S4-4-(20-22) (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS
ALL TOTAL CONSTITUENT, TCLP + SRLP ANALYSES
PHYSICAL APPEARANCE & ODOR : petrol / tar odor

FIELD TEST : VALUE :
TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS) HEADSPACE 11.7eV HNu 0.6 - 2.0 PPM



WEATHER : 20'S, OVERCAST, CALM, EARLIER FREEZING RAIN
COMMENTS : MAX. HEAD-SPACE VALUE, FROM SAMPLE OBTAINED FROM 20-22 FEET, OF 2.0 PPM.

LOG OF BORING

PROJECT: BSC Phase II-C
PROJECT NUMBER: 00120-186-152
SHEET NO.: 1 of 2
HOLE NUMBER: **SWMU S4-5**

SITE: Lackawanna, N.Y.
COORDINATES: S55+20 / W34+30
LOGGED BY: E. Fujita
CHECKED BY: E. Fujita

BEGUN: 2/28/95
COMPLETED: 2/28/95
DRILLER: B.Levergood/Huntingdon
DRILLING EQUIPMENT: CME 850, 4-1/4" H.S. Augers
BORING DIA.: 8"
TOTAL DEPTH: 38

CORE RECOVERY (FT./%): /
CORE BOXES:
SAMPLES: 19
CASING STICKUP: None
GROUND ELEV.: 612 Plant
DEPTH/*ELEV.* GROUND WATER: / 612.0 ; / 612.0
DEPTH/*ELEV.* TOP OF ROCK: / 612.0

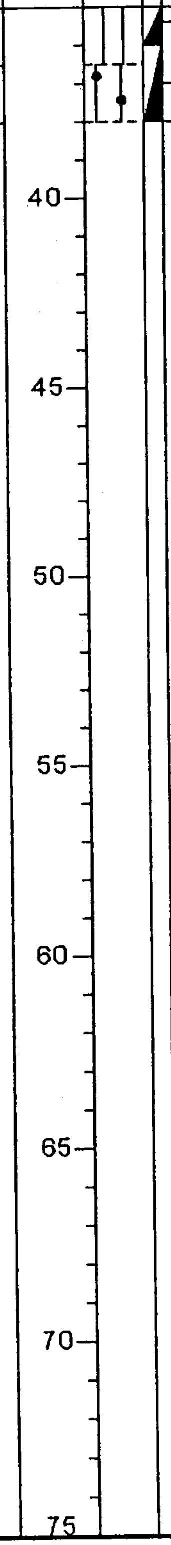
SAMPLE TYPE: 2" x 2' Standard Split Spoon
CASING DIA/LENGTH:
NOTES: Units **Feet** HNu bkg = 0.4 ppm

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
1	24/0	WOH	NA					No recovery	WOH = weight of hammer
2	24/24	WOH	1.5					BROWN CLAYEY SILT with red-brown clayey silt seams and trace of vegetation (moist) (very soft) [FILL]	WOR = weight of rods
3	24/24	WOH	2.2		5			BROWN CLAYEY SILT with red-brown clayey silt seams and trace of vegetation (moist) (very soft) [FILL]	
4	24/24	WOH	2.4					BROWN CLAYEY SILT with red-brown clayey silt and peat partings (moist) (very soft) [FILL]	Slight petrol odor
5	24/24	WOH	2.4		10			GRADES TO DARK GRAY-BROWN CLAYEY SILT with some red-brown mottles (moist) (very soft) [FILL]	
6	24/24	WOH	4.8					GRADES TO DARK GREY-BROWN CLAYEY SILT with some red-brown mottles and a trace of roots (moist) (very soft) [FILL]	Strong petrol odor
7	24/18	WOH	1.0					GRADES TO DARK GRAY-BROWN CLAYEY SILT with some red-brown mottles (moist) (very soft) [FILL]	Strong petrol odor
8	24/12	WOH	5.0		15			DARK GRAY-BROWN CLAYEY SILT with a 2" seam of black fine silty sand (moist) (very soft)	
9	24/24	2	3.8					GRADES TO RED-BROWN CLAYEY SILT with fine sand (moist) (very soft) [FILL]	
10	24/24	WOH	4.2		20			RED-BROWN CLAYEY SILT, trace fine sand (moist) (very soft) [FILL]	
11	24/6	WOH	5.2					RED-BROWN CLAYEY SILT, trace fine sands (moist) (very soft) [FILL]	Slight petrol odor
12	24/8	WOH	5.7					DARK GRAY AND RED-BROWN CLAYEY SILT (dry) (very soft) [FILL]	
13	24/24	WOH	4.8		25			GRADES TO DARK GRAY-BROWN CLAYEY SILT (moist) (very soft) [FILL]	Strong petrol odor
14	24/12	WOR	5.0					DARK GRAY-BROWN AND RED-BROWN CLAYEY SILT with a 1" zone of dark gray fine sand (moist) (very soft) [FILL]	Strong petrol odor and sheen
15	24/24	WOR	8.2		30			DARK GRAY-BROWN AND RED-BROWN CLAYEY SILT with a 1" zone of dark gray fine sand (moist) (very soft) [FILL]	Strong petrol odor and sheen
16	24/24	WOH	3.0					DARK GRAY AND RED-BROWN MOTTLED CLAYEY SILT (moist) (very soft) [FILL]	petrol/tar odor
17	24/24	WOH	6.8					DARK GRAY AND RED-BROWN MOTTLED CLAYEY SILT (moist) (very soft) [FILL]	
18	24/24	WOH	3.8		35				

LOG OF BORING

PROJECT	PROJECT NUMBER	SHEET NO.	HOLE NUMBER
BSC Phase II-C	00120-186-152	2 of 2	SWMU S4-5

continuation



SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
					DARK GRAY AND RED-BROWN MOTTLED CLAYEY SILT with .25" of gray clayey silt (moist) (very soft) [FILL]	
19	24/24	29		575.5 36.5	GRADES TO DARK GRAY AMD RED-BROWN FINE COARSE SILTY SAND with green- blue coarse sand (moist-dry) (dense) [FILL]	
				574.0 38.0	End SWMU S4-5 at 38 feet, sampled to 38 ft and augered to 38 ft, @ 13:00 on 02/28/95.	

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-186-152 JOB NAME : BSC PHASE II-C DATE : 2/28.

JOB LOCATION : LACKAWANNA, NY TIME : 15:20

SAMPLE ID : S4-5-(0-38)

SAMPLE LOCATION : SWMU S4 WEST BORING

VOC SAMPLE ID:
S4-5-(26-30)
2/28/95
1226
ALSO DUPLICATE
COLLECTED.
S4-6-(0-38)
AND S4-6-(26-30)

SAMPLERS : E. FUJITA OF : DAMES + MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

SAMPLE TYPE : POINT ☐ GRAB ☒ VOC Analysis only COMPOSITE ☒ All Non-VOC Analyses

SAMPLE DESCRIPTION : DARK GRAY-BROWN CLAYEY SILT, some red-brown mottles (moist) (very soft) petrol odor

SAMPLE ANALYSIS

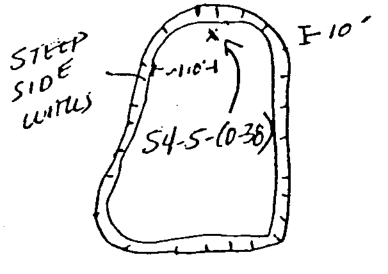
SAMPLE ID : S4-5-(0-38) + S4-5-(26-30) (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS - ALL TOTAL CONSTITUENT, TCLP + SRLP ANALYSES

PHYSICAL APPEARANCE & ODOR : petrol odor

FIELD TEST : VALUE :

TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS) HEADSPACE 11.7eV HNU 1.0 - 8.2 ppm



WEATHER : LOW 30'S, OVERCAST, RAIN + SNOW

COMMENTS : MAX. HEADSPACE VALUE, FROM SAMPLE OBTAINED FROM 28-30 FEET, OF 8.2 PPM.

LOG OF BORING

PROJECT Bethlehem Steel Corporation	PROJECT NUMBER 00120-173-162	SHEET NO. 1 of 1	HOLE NUMBER SWMU-S5-1
SITE Lackawanna, NY	COORDINATES S65+70 / W31+20	LOGGED BY K. Ignaszak	CHECKED BY L. Keefe
BEGUN 8-06-94	COMPLETED 8-06-94	DRILLER Empire Soils/Ron Brown	DRILLING EQUIPMENT CME 850, 2-1/4" H.S. Augers
BORING DIA. 4"	TOTAL DEPTH 21.5	CORE RECOVERY (FT./%) /	CORE BOXES
SAMPLES 11	CASING STICKUP None	GROUND ELEV. 621 Plant	DEPTH/*ELEV.* GROUND WATER 48.25 / *574.7* 46.25 / *574.7*
DEPTH/*ELEV.* TOP OF ROCK 81 / *540.0*	SAMPLE TYPE 2" x 2' Standard Split Spoon	CASING DIA/LENGTH None	NOTES HNu background reading = 0.8ppm

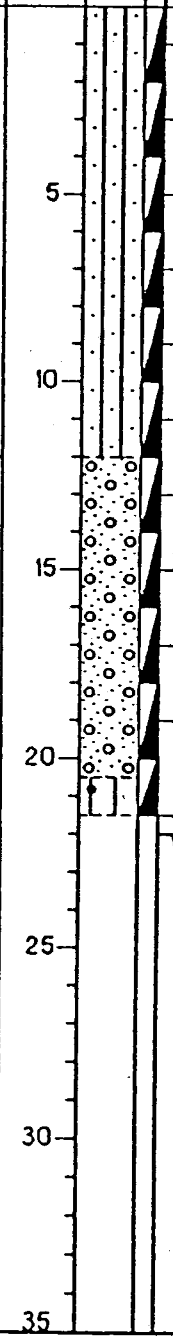
SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)
1	24/2	WOH	2.8
2	24/12	WOH	2.1
3	24/18	WOH	3.1
4	24/12	1	2.9
5	24/24	WOH	2.7
6	24/24	WOH	3.8
7	24/24	1	3.4
8	24/24	1	1.8
9	24/24	5	3.2
10	24/8	1	2.3
11	18/18	80	2.1

LAYER *Elev.* Depth

609.0 12.0

600.5 20.5

599.5 21.5



DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor

- DARK GRAY FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL] (strong petro and sanitary odor)
- DARK GRAY FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL] (strong petro and sanitary odor)
- DARK GRAY FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL] (strong petro and sanitary odor)
- DARK GRAY FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL] (strong petro and sanitary odor)
- DARK GRAY FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL] (strong petro and sanitary odor)
- DARK GRAY FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL] (strong petro and sanitary odor)
- GRADING TO DARK GRAY FINE TO MEDIUM GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL] (strong petro and sanitary odor)
- GRADES TO FINE GRAINED SILTY SAND AND CLAYEY SILT with some cinders (moist) (soft) [FILL] (strong petro and sanitary odor)
- GRADES TO MORE MEDIUM GRAINED SILTY SAND
- GRADES TO FINE GRAINED SILTY SAND AND CLAYEY SILT with some cinders (moist) (soft) [FILL] (strong petro and sanitary odor), more medium grained silty sand
- GRAY AND GREENISH GRAY FINE GRADED GRAVEL AND FINE GRAINED SILTY SAND (moist) (dense) [FILL] (slag fragments with a slight coke odor)
- End of SWMU-S5-1 21.5 ft, sampled to 21.5 ft and augered to 20 ft @ 08:00 on 8/06/94.

DRILLING NOTES water levels, water return, character of drilling, etc.

Note: WOH = weight of hammer

Dames & Moore

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-173-152 JOB NAME : BSC-PHASE IIB DATE : 6/6/94
TIME : 11:00
0838 (VOCs)
JOB LOCATION : LACKAWANNA, NY

SAMPLE ID : SWMU-S5-1
SAMPLE LOCATION : SWMU-S5

SAMPLERS : K. IGNASZAK OF : DAMES & MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

SAMPLE TYPE : POINT ☐ GRAB ☒ VOCs ONLY COMPOSITE ☒ ALL OTHERS

SAMPLE DESCRIPTION : DARK GRAY FINE TO MEDIUM GRAINED SILTY SAND AND CLAYEY SILT (MOIST) (SOFT) [FILL] (STRONG PETRO - SANITARY ODOR)

SAMPLE ANALYSIS

SAMPLE ID : SWMU-S5-1 (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR : CN, BNA, ~~TCA~~ METALS, VOC (ALL TCLP, TCA, SLP)

PHYSICAL APPEARANCE & ODOR : SEE ABOVE

FIELD TEST : VALUE :

TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS) HNU = 3.8 ppm (10'-12')

WEATHER : OVERCAST, CALM, 70°

COMMENTS : VOC SAMPLES GRABBED FROM 10'-12' TOTAL = 3
ALL OTHERS COMPOSITED FROM 0-21.5' TOTAL = 9

LOG OF BORING

PROJECT Bethlehem Steel Corporation	PROJECT NUMBER 00120-173-162	SHEET NO. 1 of 1	HOLE NUMBER SWMU-S5-2	
SITE Lackawanna, NY	COORDINATES S66+40 / W30+10	LOGGED BY K. Ignaszak	CHECKED BY L. Keefe	
BEGUN 6-06-94	COMPLETED 6-06-94	DRILLER Empire Soils/Ron Brown	DRILLING EQUIPMENT CME 850, 2-1/4" H.S. Augers	BORING DIA. 4"
TOTAL DEPTH 21.3	CORE RECOVERY (FT./%) /	CORE BOXES	SAMPLES 11	CASING STICKUP None
GROUND ELEV. 622 Plant	DEPTH/*ELEV.* GROUND WATER 47.25 / 574.7 47.25 / 574.7	DEPTH/*ELEV.* TOP OF ROCK 82 / 540.0		
SAMPLE TYPE 2" x 2' Standard Split Spoon	CASING DIA/LENGTH None	NOTES HNu background reading = 0.6ppm		

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth
1	24/0	2	NA	
2	24/24	1	8.1	*619.7* 2.3
3	24/0	WOH	NA	
4	24/24	WOH	10.1	
5	24/24	WOH	12.8	*613.0* 9.0 *612.0* 10.0
6	24/6	WOH	18.2	*610.1* 11.9
7	24/18	WOH	19.2	
8	24/24	WOH	28	
9	24/18	1	8.7	
10	24/24	1	72	
11	15/12	50/.8	80	*601.0* *600.9* 21.3

DESCRIPTION AND CLASSIFICATION
density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor

No recovery

YELLOWISH RED AND DARK GRAY FINE TO MEDIUM GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL] (strong petor odor)

No recovery

YELLOWISH RED FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL] (strong petor odor and oil globules)

.25" to 1" THICK STRATIFIED LAYERS OF DARK BROWN AND BROWN WITH GRAY FINE GRAINED SILTY SAND (moist) (soft) [FILL]

YELLOWISH RED FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL] (strong petor odor and oil globules)

DARK GRAY FINE TO COARSE GRAINED SILTY SAND with clayey silt (moist) (soft) (strong petro coke odor)

DARK GRAY FINE TO COARSE GRAINED SILTY SAND with clayey silt (moist) (soft) (strong petro coke odor)

DARK GRAY FINE TO COARSE GRAINED SILTY SAND with clayey silt (moist) (soft) (strong petro coke odor)

DARK GRAY FINE TO COARSE GRAINED SILTY SAND with clayey silt (moist) (soft) (strong petro coke odor)

DARK GRAY FINE TO COARSE GRAINED SILTY SAND with clayey silt (moist) (soft) (strong petro coke odor)

GRAY AND GREENISH GRAY FINE GRADED GRAVEL AND FINE GRAINED SILTY SAND (moist) (dense) [FILL] (slag fragments and strong coke odor)

End SWMU-S5-2, sampled to 21.3 ft and augered to 20 ft @ 13:11 on 6/06/94.

DRILLING NOTES
water levels, water return, character of drilling, etc.

Note: WOH = weight of hammer

Dames & Moore

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-173-152 JOB NAME : BSC PHASE IIB DATE : 6/6/94
JOB LOCATION : LACKAWANNA, NY TIME : 1430
1300 (VOC's)

SAMPLE ID : SWMU-S5-Z
SAMPLE LOCATION : SWMU-S5

SAMPLERS : K. IGNASZAK OF : DAMES & MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

SAMPLE TYPE : POINT ☐ GRAB ☒ VOC'S ONLY COMPOSITE ☒ ALL OTHERS

SAMPLE DESCRIPTION : DARK GRAY FINE TO MEDIUM GRAINED SILTY SAND AND CLAYEY SILT (MOIST) (SOFT) [FILL] (STRONG PETRO COKE ODOR)

SAMPLE ANALYSIS

SAMPLE ID : SWMU-S5-Z (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : CN, BNA, METALS, VOC (ALL TCLP, TCA, SLP)
PHYSICAL APPEARANCE & ODOR : SEE ABOVE

FIELD TEST : VALUE :
TEMP. (°C/°F)
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS) H-NU = 72.0 PPM (18'-20')

WEATHER : SUN + CLOUDS, MOD. WIND, 75°
COMMENTS : VOC SAMPLE GRABBED FROM 18-20' TOTAL = 3
ALL OTHERS COMPOSITED FROM 0'-21.3' TOTAL = 9

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-~~173~~186-152 JOB NAME : BSC PHASE II-C DATE : 2/9/95

JOB LOCATION : LACKAWANNA, NY TIME : 13:30

SAMPLE ID : SS-1-(0-6)

SAMPLE LOCATION : SUMU SS-1 WEST

SAMPLERS : Mike Parish OF : DAMES + MOORE

Brad Phillips " "

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐

STANDARD SPLIT SPOON ☐ HAND AUGER ☐ [✓ SPOON]/TROWER ☒

SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : Black moist sludge

Frozen

SAMPLE ANALYSIS

SAMPLE ID : SS-1-(0-6) (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS

ALL TOTAL CONSTITUENT, TCLP + SRLP ANALYSES

PHYSICAL APPEARANCE & ODOR : black, strong coke odor

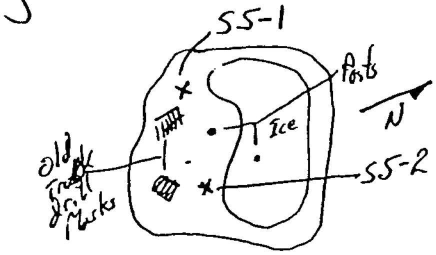
FIELD TEST : VALUE :

TEMP. (°C/°F) NA

pH

SPEC. COND.(μMHOs/CM)

OTHER (UNITS)



WEATHER : 20°F, strong gusts, snow

COMMENTS : used pick to break up material

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-~~173~~ 186-152 JOB NAME : BSC PHASE II-C DATE : 2/9/95

JOB LOCATION : LACKAWANNA, NY TIME : 13:45

SAMPLE ID : SS-2 (0-6)

SAMPLE LOCATION : SWMU SS-2 EAST

SAMPLERS : Mike Parish OF : DAMES + MOORE

Brad Phillips " "

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐ STANDARD SPLIT SPOON ☐ HAND AUGER ☐ [✓ SPOON]/TROWER ☒

SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : Black moist sludge

Frozen

SAMPLE ANALYSIS

SAMPLE ID : SS-2-(0-6) (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS

ALL TOTAL CONSTITUENT, TCLP + SRLP ANALYSES

PHYSICAL APPEARANCE & ODOR : black, strong coke odor

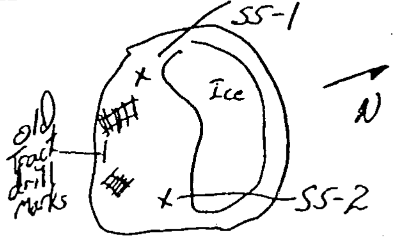
FIELD TEST : VALUE :

TEMP. (°C/°F) NA

pH

SPEC. COND.(μMHOs/CM)

OTHER (UNITS)



WEATHER : 20°F, strong gusts, snow

COMMENTS : used pick to break up material

LOG OF BORING

PROJECT Bethlehem Steel Corporation	PROJECT NUMBER 00120-173-152	SHEET NO. 1 of 1	HOLE NUMBER SWMU-S6	
SITE Lackawanna, NY	COORDINATES S64+50 / W28+10	LOGGED BY K. Ignaszak	CHECKED BY L. Keefe	
BEGUN 8-07-94	COMPLETED 8-07-94	DRILLER Empire Soils/Ron Brown	DRILLING EQUIPMENT CME 850, 2-1/4" H.S. Augers	BORING DIA. 4"
TOTAL DEPTH 33.8	CORE RECOVERY (FT./%) /	CORE BOXES	SAMPLES 17	CASING STICKUP None
GROUND ELEV. 632 Plant	DEPTH/*ELEV.* GROUND WATER ▽ 58.75 / *575.2* ▼ 58.75 / *575.2*	DEPTH/*ELEV.* TOP OF ROCK 92 / *540.0*		
SAMPLE TYPE 2" x 2' Standard Split Spoon	CASING DIA/LENGTH None	NOTES HNu background reading = 0.4ppm		

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
1	24/15	1	0.2					YELLOWISH RED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	Note: WOH = weight of hammer
2	24/24	2	0.2					GRADING TO YELLOWISH RED AND BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
3	24/18	1	0.8		5			YELLOWISH RED AND BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
4	24/24	2	0.8					GRADES TO DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
5	24/24	WOH	0.8					DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
6	24/24	1	1.8		10			GRADING TO DARK BROWN FINE TO MEDIUM GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
7	24/24	4	1.0					DARK BROWN FINE TO MEDIUM GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
8	24/24	4	2.3		15			DARK BROWN FINE TO MEDIUM GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
9	24/24	4	1.4					GRADING TO DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
10	24/24	1	1.5					DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
11	24/24	1	1.0		20			DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
12	24/24	4	1.3					DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
13	24/24	WOH	1.8		25			DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
14	24/24	2	2.0					DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
15	24/24	WOH	2.2					DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
16	24/24	1	1.8		30			DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	End SWMU-S6 @33.7 ft, sampled to 33.7 ft, augered to 30 ft @ 09:20 on 08/07/94.
17	18/18	5	1.8	*598.5* 33.6	35			@ 33.5 DARK GRAY TO GRAY FINE GRADED GRAVEL AND FINE GRAINED SILTY SAND (moist) (very dense) [FILL] (slag fragments, no odor)	

Dames & Moore

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-173-152 JOB NAME : BSC PHASE IIB DATE : 6/7/94
JOB LOCATION : LACKAWANNA, NY TIME : 10:30
08:28(k)

SAMPLE ID : SWMU-S6
SAMPLE LOCATION : SWMU-S6

SAMPLERS : K. IGNASZAK OF : DAMES & MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☒
VOC'S ONLY ALL OTHERS

SAMPLE DESCRIPTION : DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (MOIST) (SOFT) [FILL]

SAMPLE ANALYSIS

SAMPLE ID : SWMU-S6 (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : CN, METALS, BNA, VOC (ALL TCA, TCLP, SPLP)
PHYSICAL APPEARANCE & ODOR : SEE ABOVE

FIELD TEST : VALUE :
TEMP. (°C/°F)
pH NA
SPEC. COND.(μMHOs/CM)
OTHER (UNITS) H·NU = 2.3 ppm (14'-16')

WEATHER : CLEAR, MOD WIND, 75°
COMMENTS : VOC SAMPLE GRABBED FROM 14'-16' TOTAL
ALL OTHERS COMPOSITED FROM 0'-33.8' TOTAL 9

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120 - ~~173~~ 186 -152 JOB NAME : BSC PHASE II-C DATE : 2/19/95
JOB LOCATION : LACKAWANNA, NY TIME : 14:00

SAMPLE ID : S6-1-(0-6)
SAMPLE LOCATION : swmu S6-1 SOUTH

SAMPLERS : Mike Parish OF : DAMES + MOORE
Brad Phillips " "

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☐ HAND AUGER ☐ [✓ SPOON]/TROWER ☒

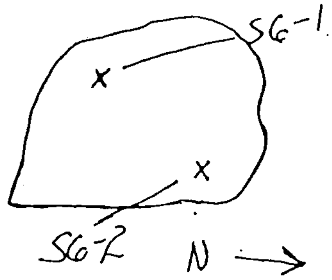
SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : red-brown f-c SAND + GRAVEL
Frozen

SAMPLE ANALYSIS

SAMPLE ID : S6-1-(0-6) (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS
ALL TOTAL CONSTITUENT, TCLP + SPLP ANALYSES
PHYSICAL APPEARANCE & ODOR : red-brown angular pieces

FIELD TEST : VALUE :
TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS)



WEATHER : 20°F strong gusts, snow
COMMENTS : used pick to break up material

DAMES & MOORE

SOIL/SEDIMEN
SAMPLE RECOR

JOB No.: 00120-~~173~~ 186-152 JOB NAME : BSC PHASE II-C DATE : 2/9/9
JOB LOCATION : LACKAWANNA, NY TIME : 14:

SAMPLE ID : S6-2-(0-6)
SAMPLE LOCATION : Sump S6-2 NORTH

SAMPLERS : Mike Parish OF : DAMES + MOORE
Brad Phillips " "

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☐ HAND AUGER ☐ [✓ SPOON]/TROWER ☒

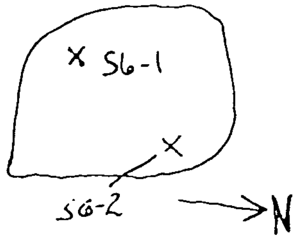
SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : red-brown f-c SAND & GRAVEL
Frozen

SAMPLE ANALYSIS

SAMPLE ID : S6-2-(0-6) (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS
ALL TOTAL CONSTITUENT, TCLP + SPLP ANALYSES
PHYSICAL APPEARANCE & ODOR : red-brown angular pieces

FIELD TEST : VALUE :
TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS)



WEATHER : 20°F strong gusts, snow
COMMENTS : used pick to break up material

LOG OF BORING

PROJECT BSC Phase II-C	PROJECT NUMBER 00120-186-152	SHEET NO. 1 of 1	HOLE NUMBER SMWU S6-3

'TE _ackawanna, N.Y.	COORDINATES S64+90 / W28+35	LOGGED BY E. Fujita	CHECKED BY E. Fujita

BEGUN 2/8/95	COMPLETED 2/8/95	DRILLER B.Levergood/Huntingdon	DRILLING EQUIPMENT CME 850, 4-1/4" H.S. Augers	BORING DIA. 8"	TOTAL DEPTH 24.8

CORE RECOVERY (FT./%) /	CORE BOXES	SAMPLES 14	CASING STICKUP None	GROUND ELEV. 632 Plant	DEPTH/*ELEV.* GROUND WATER ▽ / *632.0* ▼ / *632.0*	DEPTH/*ELEV.* TOP OF ROCK / *632.0*

SAMPLE TYPE 2" x 2' Standard Split Spoon	CASING DIA/LENGTH	NOTES Units **Feet** HNu bkg = 0.6 ppm

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
1	24/6	WOH	7.2					BLACK CLAYEY SILT (tar like) with metallic fines (moist) (very soft) [FILL]	Note: WOH = weight of hammer Tar odor, augers easy
2	24/20	WOH	2.0					BLACK CLAYEY SILT (tar like) with metallic fines (moist) (very soft) [FILL]	Strong tar odor
3	24/6	WOH	4.2		5			BLACK CLAYEY SILT (tar like) with metallic fines (moist) (very soft) [FILL]	Strong tar/sludge odor
4	24/12	WOH	5.0					BLACK CLAYEY SILT (tar like) with metallic fines (moist) (very soft) [FILL]	Strong tar/sludge odor
5	24/18	WOH	3.8		10			BLACK CLAYEY SILT (tar/sludge like) with some fine white partings and metallic fines (moist) (very soft) [FILL]	
6	24/18	WOH	4.2					BLACK CLAYEY SILT (tar/sludge like) with some fine white partings and metallic fines (moist) (very soft) [FILL]	
7	24/24	WOH	14.2					BLACK CLAYEY SILT (tar/sludge like) with some fine white partings and metallic fines (moist) (very soft) [FILL]	
8	24/16	WOH	3.0		15			BLACK CLAYEY SILT (tar/sludge like) with some metallic fines (moist) (very soft) [FILL]	Strong tar odor
9	24/24	WOH	1.2					BLACK CLAYEY SILT (tar/sludge like) with some metallic fines (moist) (very soft) [FILL]	Strong tar odor
10	24/20	WOH	11.2		20			BLACK CLAYEY SILT (tar/sludge like) with some metallic fines (moist) (very soft) [FILL]	Strong tar odor
11	24/12	WOH	2.8					DARK GRAY CLAYEY SILT (tar/sludge like) (moist) (very soft) [FILL]	Strong tar odor
12	3/3	WOH	1.8	*610.0* 22.0				BROWN FINE SILTY SAND WITH SOME COARSE GRAVEL (moist) (very dense) [SLAG FILL]	Augers hard
13	10/4	100/.3	9.8	*607.2* 24.8	25			LIGHT BLUE-GREEN FINE COARSE SAND (dry) (very dense) [SLAG FILL] End SWMU S6-3 @ 24.8 feet, sampled to s4.8 ft and augered to 24 ft, @11:45 on 02/27/95.	
					30				
					35				

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-186-152 JOB NAME : BSC PHASE II-C DATE : 2/27/95

JOB LOCATION : LACKAWANNA, NY TIME : 13 : 15

SAMPLE ID : S6-3-(0-24.8)

SAMPLE LOCATION : SWMU S6

VOC SAMPLE ID:
S6-3-(12-14)
2 27-95
1056

SAMPLERS : E. FUJITA OF : DAMES + MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐ STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

SAMPLE TYPE : POINT ☐ GRAB ☒ VOC Analysis only COMPOSITE ☒ All Non-VOC Analyses

SAMPLE DESCRIPTION : BLACK CLAYEY SILT AND METALLIC FINES (moist) (very soft) tar/sludge-like appearance strong tar odor

SAMPLE ANALYSIS

SAMPLE ID : S6-3-(0-24.8) + S6-3-(12-14) (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS ALL TOTAL CONSTITUENT, TCLP + SRLP ANALYSES

PHYSICAL APPEARANCE & ODOR : tar/sludge-like appearance, strong tar odor

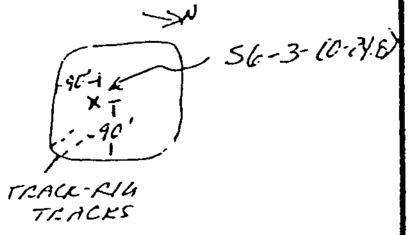
FIELD TEST : VALUE :

TEMP. (°C/°F) NA

pH

SPEC. COND.(μMHOs/CM)

OTHER (UNITS) HEADSPACE 11.7eV HNU 1.2 - 14.2 PPM



WEATHER : 20'S, OVERCAST, CALM, EARLIER FREEZING RAIN

COMMENTS : MAX. HEAD SPACE VALUE, FROM SAMPLE OBTAINED FROM 12-14 FEET, OF 14.2 PPM.

LOG OF BORING

PROJECT Bethlehem Steel Corporation	PROJECT NUMBER 00120-173-152	SHEET NO. 1 of 3	HOLE NUMBER SWMU-S7

SITE Lackawanna, NY	COORDINATES S59+40 / W28+70	LOGGED BY K. Ignaszak	CHECKED BY L. Keefe

BEGUN 8-07-94	COMPLETED 8-07-94	DRILLER Empire Soils/Ron Brown	DRILLING EQUIPMENT CME 850, 2-1/4" H.S. Augers	BORING DIA. 4"	TOTAL DEPTH 41.8

CORE RECOVERY (FT./%) /	CORE BOXES	SAMPLES 21	CASING STICKUP None	GROUND ELEV. 615 Plant	DEPTH/*ELEV.* GROUND WATER ▽ 39.5 / *575.5* ▼ 39.5 / *575.5*	DEPTH/*ELEV.* TOP OF ROCK 73 / *542.0*

SAMPLE TYPE 2" x 2' Standard Split Spoon	CASING DIA/LENGTH None	NOTES HNu background reading = 0.4ppm

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
								GRADES TO YELLOWISH RED FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL] (slag fragments)	
1	24/24	3	2.8						
				613.2 1.8	2			GREENSIH GRAY TO BROWN FINE TO MEDIUM GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	Note: WOH = weight of hammer
2	24/0	3	NA					No recovery	
					4				
								YELLOWISH RED FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL]	
3	24/24	WOH	0.4						
					6				
								GRADES TO YELLOWISH RED AND DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
4	24/15	2	1.4						
					8				
								YELLOWISH RED AND DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
5	24/12	3	1.9						
					10			GRADES TO YELLOWISH RED AND DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
6	24/15	WOH	1.5						
				603.5 *603.3* 11.5 11.7				VEIN OF DARK BROWN FINE GRAINED SILTY SAND	
					12				
7	24/24	WOH	2.0					YELLOWISH RED AND DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
					14				

Dames & Moore

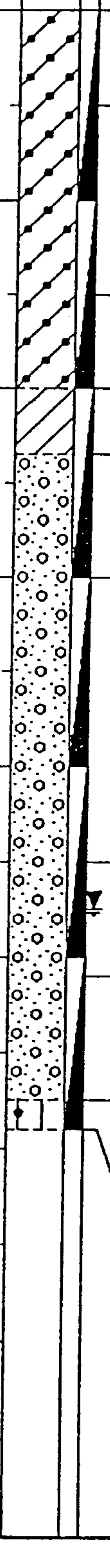
LOG OF BORING	PROJECT	PROJECT NUMBER	SHEET NO.	HOLE NUMBER
	Bethlehem Steel Corporation	00120-173-152	2 of 3	SWMU-S7

continuation

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DEPTH	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
8	24/24	WOH	0.8			YELLOWISH RED AND DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
					16	YELLOWISH RED AND DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
9	24/24	2	1.8	*598.0* 17.0			
				597.4 17.8		VEIN OF DARK BROWN TO YELLOWISH RED FINE TO COARSE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
					18	YELLOWISH RED AND DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
10	24/24	WOH	1.0	*596.0* 19.0		MOTTLED YELLOWISH RED AND DARK GRAY FINE GRAINED SILTY SAND AND CLAYEY SILT (moist) (soft) [FILL] (free petro product visible)	
				595.2 19.8			
					20	YELLOWISH RED TO DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
11	24/24	1	1.0	*594.0* 21.0 *593.7* 21.3		VEIN OF DARK GRAY FINEGRAINED SILTY SAND WITH CLAYEY SILT (free petro product visible)	
					22	YELLOWISH RED TO DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
12	24/24	2	3.8				
				591.7 23.3 *591.5* 23.5		DARK GRAY FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL] (free petro product visible)	
					24		
				590.7 24.3 *590.5* 24.5		MOTTLED DARK GRAY AND DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
13	24/24	1	1.2			YELLOWISH RED TO DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
					26		
14	24/24	3	2.9			YELLOWISH RED AND DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
				587.1 27.9 *586.9* 28.1	28	DARK GRAY FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
						YELLOWISH RED TO DARK BROWN FINE GRAINED SILTY SAND with clayey silt (moist) (soft) [FILL]	
15	24/24	WOH	1.8	*586.0* 29.0		MOTTLED DARK GRAY AND BROWN FINE GRAINED SITLY SAND with clayey silt (moist) (soft) [FILL]	
					30		

LOG OF BORING	PROJECT Bethlehem Steel Corporation	PROJECT NUMBER 00120-173-152	SHEET NO. 3 of 3	HOLE NUMBER SWMU-S7

continuation



SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DEPTH	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
				585.0 30.0			
16	24/6	39	1.6			GRAY, DARK GRAY AND GREENISH GRAY MEDIUM GRAINED SILTY SAND with fine gravel, trace silty clay (moist) (medium dense) [FILL] (slag fragments)	
					32		
17	24/6	26	2.2			GRAY, DARK GRAY AND GREENISH GRAY MEDIUM GRAINED SILTY SAND with fine gravel, trace silty clay (moist) (medium dense) [FILL] (slag fragments)	
18	24/18	20	1.8	*581.0* 34.0	34	At 34-34.7 ft GRAY CLAYEY SILT (moist) (medium stiff) [FILL]	
				580.3 34.7		At 34.7-36 ft DARK GRAY FINE TO COARSE GRAINED SILTY SAND (moist) (medium dense) [FILL] (slag fragments)	
					36	GRADES TO MOTTLED CLAYEY SILT AND DARK GRAY FINE TO COARSE GRAINED SILTY SAND (moist) (medium dense) [FILL] (slag fragments)	
19	24/18	19	1.8				
					38		
20	24/0	20	1.8			No recovery	
					40	MOTTLED CLAYEY SILT AND DARK GRAY FINE TO COARSE GRAINED SILTY SAND (moist) (medium dense) [FILL] (slag fragments)	
21	21/5	62	1.5				
				573.5 41.5 *573.2* 41.8		GRAY FINE TO MEDIUM GRADED GRAVEL with BROWN FINE TO MEDIUM GRAINED SILTY SAND (moist) (dense) [FILL] (slag fragments)	
					42	End SWMU-S7, sampled to 41.8 ft, augered to 40 ft @ 09:00 on 6/08/94.	
					44		
					46		

Dames & Moore

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-173-152 JOB NAME: BSC PHASE IIB DATE: 6/7/

JOB LOCATION: LACKAWANNA NY TIME: 14:30

12:05(VOC

SAMPLE ID: SWMU-S7-1

SAMPLE LOCATION: SWMU-S7 "TOP LAYER"

SAMPLERS: K. IGNASZAK OF: DAMES & MOORE

SAMPLE CLASSIFICATION: SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD: BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐ STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

SAMPLE TYPE: POINT ☐ GRAB ☒ VOC'S ONLY COMPOSITE ☒ ALL OTHERS

SAMPLE DESCRIPTION: YELLOWISH RED TO DARK BROWN FINE GRAINED SILTY SAND AND CLAYEY SILT (MOIST) (SOFT) [FILL]

SAMPLE ANALYSIS

SAMPLE ID: SWMU-S7-1 (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR: CN, METALS, BNA, VOC (ALL TCLP, SLP, TCA)

PHYSICAL APPEARANCE & ODOR: SEE ABOVE

FIELD TEST:	VALUE:
TEMP. (°C/°F)	NA
pH	
SPEC. COND.(μMHOs/CM)	
OTHER (UNITS)	H·Nu = 3.8 ppm (22'-24')

WEATHER: CLEAR, MOD. WIND, 75°

COMMENTS: VOC SAMPLES GRABBED FROM 22'-24' TOTAL=3
ALL OTHERS COMPOSITED FROM 0'-30' TOTAL=9

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120-173-152 JOB NAME : BSC PHASE II DATE : 6/8/94

JOB LOCATION : LACKAWANNA, NY TIME : 12:00 FOR ALL

SAMPLE ID : SWMU-S7-2

SAMPLE LOCATION : SWMU-S7 "BOTTOM LAYER"

SAMPLERS : K IGNASZAK OF : DAMES & MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐ STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

SAMPLE TYPE : POINT ☐ GRAB ☒ VOC ONLY COMPOSITE ☒ ALL OTHERS

SAMPLE DESCRIPTION : DARK BROWN FINE TO COARSE GRAINED SILTY SAND AND CLAYEY SILT WITH FINE GRADED GRAVEL (MOIST) (LOOSE) [FILL] (SLAG AND BRICK FRAGMENTS)

SAMPLE ANALYSIS

SAMPLE ID : SWMU-S7-2 (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR : CN, BNA, VOC, METALS (TCA, ALL TCLP, SPLP)

PHYSICAL APPEARANCE & ODOR : SEE ABOVE

FIELD TEST : VALUE :

TEMP. (°C/°F)

pH

SPEC. COND.(μMHOs/CM)

OTHER (UNITS) H·Nu = 2.2 ppm (32'-34')

WEATHER : SUN + CLOUDS MOD WIND, 65°

COMMENTS : ALL SAMPLES FROM 6/7/94 AND 6/8/94 PLACED IN JARS AT 12:00 ON 6/8/94

VOC SAMPLES GRABBED FROM 32'-34' TOTAL = 3

ALL OTHERS COMPOSITED FROM 30'-41.8' TOTAL = 9

⑫

LOG OF BORING

PROJECT: BSC Phase II-C
PROJECT NUMBER: 00120-186-152
SHEET NO.: 1 of 1
HOLE NUMBER: **SWMU S7-1**

SITE: Lackawanna, N.Y.
COORDINATES: S60+30 / W30+70
LOGGED BY: E. Fujita
CHECKED BY: E. Fujita

BEGUN: 2/8/95
COMPLETED: 2/8/95
DRILLER: B.Levergood/Huntingdon
DRILLING EQUIPMENT: CME 55, 4-1/4" H.S. Augers
BORING DIA.: 8"
TOTAL DE.: 28

CORE RECOVERY (FT./%): /
CORE BOXES:
SAMPLES: 14
CASING STICKUP: None
GROUND ELEV.: 618 Plant
DEPTH/*ELEV.* GROUND WATER: ▽ / *618.0* ▼ / *618.0*
DEPTH/*ELEV.* TOP OF ROCK: / *618.0*

SAMPLE TYPE: 2" x 2' Standard Split Spoon
CASING DIA/LENGTH:
NOTES: Units =**Feet** HNu bkg = 0.8ppm

SAMPLE NUMBER	LENGTH/RECOV. (inches)	BLOWS PER FOOT	HNu (ppm)	LAYER *Elev.* Depth	DEPTH	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
1	24/6	12	4.2			RED-BROWN FINE SILTY SAND AND RED-BROWN AND DARK GREEN MOTTLED SILTY CLAY with few coarse slag fragments (dry) (loose) [FILL]	Note: WOH = weight of hammer
2	24/18	4	2.0			GRADES TO RED-BROWN AND RED SILTY CLAY (moist) (soft) [FILL]	aromatic odor
3	24/20	2	2.2		5	GRADES TO RED-BROWN AND RED SILTY CLAY wiht some fine dark brown sand seams (moist) (soft) [FILL]	
4	24/18	7	4.8			REDDISH-BROWN SILTY CLAY with a trace of dark gray angular sand (dry) (medium stiff) [FILL]	
5	24/24	9	3.0		10	REDDISH-BROWN SILTY CLAY with dark brown silt seams (moist) (medium stiff)	
6	24/22	4	1.8			REDDISH-BROWN SILTY CLAY with dark gray fine silt seams (cinders) (moist) (soft) [FILL]	
7	24/22	3	1.8			REDDISH-BROWN SILTY CLAY with dark gray fine silt seams (cinders) (moist) (soft) [FILL]	
8	24/24	1	1.8		15	REDDISH-BROWN SILTY CLAY with dark gray fine silt seams (cinders) (moist) (soft) [FILL]	
9	24/24	4	2.0			REDDISH-BROWN SILTY CLAY with dark brown fine sand seams (moist-dry) (soft) [FILL]	aromatic odor
10	24/24	5	3.0		20	REDDISH-BROWN SILTY CLAY with dark brown fine sand seams with a trace of metallic fragments (moist-dry) (soft) [FILL]	aromatic odor
11	24/24	2	2.0			REDDISH-BROWN SILTY CLAY AND DARK GRAY FINE SAND SEAMS (moist) (very soft) [FILL]	aromatic odor
12	24/24	40	1.8	*595.0* 23.0		GRADES TO DARK GRAY FINE TO COARSE SILTY SAND IN TIP OF SPOON (dry) (hard) (wood fragments) [SLAG FILL]	
13	24/20	45	1.8		25	DARK GRAY FINE TO COARSE SILTY SAND AND TRACE OF BROWN SAND with a few coarse sands (dry) (dense) [SLAG FILL]	
14	24/12	32	2.2			DARK GRAY FINE TO COARSE SILTY SAND with a trace of tan brick debris (moist) (dense) [FILL]	Tip of spoon wet
				590.0 28.0	30	End SWMU S7-1 at 28 feet, sampled to 28 feet and augered to 28 feet, @11:40 on 02/08/95.	
					35		

Dames & Moore

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 00120- -152 JOB NAME : BSC PHASE II-C DATE : 2/8/95
JOB LOCATION : LACKAWANNA, NY TIME : 15:20

SAMPLE ID : S7-1.(0-30)
SAMPLE LOCATION : SWMU S-7
NORTH-WEST AREA

VOC SAMPLE ID:
S7-1.(6-10)
2.8.95 1141

SAMPLERS : E. FUJITA OF : DAMES + MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐
STANDARD SPLIT SPOON ☒ HAND AUGER ☐ SPOON/TROWER ☐

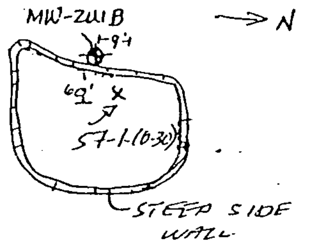
SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☒
VOC Analysis only All Non-VOC Analyses

SAMPLE DESCRIPTION : REDDISH-BROWN SILTY CLAY
with dark gray fine silt seams (moist) (medium stiff)

SAMPLE ANALYSIS

SAMPLE ID : S7-1-(0-30) + S7-1-(6-10) (AS SHOWN ON CHAIN OF CUSTODY)
TEST FOR : VOC, BNA, METALS, INDICATOR PARAMETERS
ALL TOTAL CONSTITUENT, TCLP + SRLP ANALYSES
PHYSICAL APPEARANCE & ODOR :

FIELD TEST : VALUE :
TEMP. (°C/°F) NA
pH
SPEC. COND.(μMHOs/CM)
OTHER (UNITS) HEADSPACE 11.7eV HNU 1.8 - 4.8 ppm



WEATHER : 5° w/WINDCHILL, PARTLY CLOUDY, SOME SUN
COMMENTS : MAX. HEAD-SPACE VALUE, FROM SAMPLE OBTAINED FROM 6-8 FEET, OF 4.8 PPM.

DAMES & MOORE

SOIL/SEDIMENT SAMPLE RECORD

JOB No.: 0012C-173-152 JOB NAME : BSC PHASE IIB DATE : 6/16/94

JOB LOCATION : LACKAWANNA, NY TIME : 09:00

SAMPLE ID : SWMU-S27

SAMPLE LOCATION : SWMU-S27

SAMPLERS : K IGNASZAK OF : DAMES & MOORE

SAMPLE CLASSIFICATION : SOIL ☒ SEDIMENT ☐ SOLID WASTE ☐

SAMPLING METHOD : BOTTOM SAMPLER/DREDGE ☐ CORE SAMPLER ☐ STANDARD SPLIT SPOON ☐ HAND AUGER ☐ SPOON/TROWER ☒

SAMPLE TYPE : POINT ☐ GRAB ☒ COMPOSITE ☐

SAMPLE DESCRIPTION : DARK GRAY FINE TO MEDIUM GRAINED SILTY SAND WITH TRAY OF DARK GRAY FINE GRADED GRAVEL (LOOSE) (MOIST) [FILL] (SLAG FRAGMENTS, SOME SLIGHT TRACE OF OIL PRODUCT)

SAMPLE ANALYSIS

SAMPLE ID : SWMU-S27 (AS SHOWN ON CHAIN OF CUSTODY)

TEST FOR : CN, BNA, VOC, METALS (ALL- TCA, TCLP, SLP)

PHYSICAL APPEARANCE & ODOR : SEE ABOVE

FIELD TEST :	VALUE :
TEMP. (°C/°F)	NA
pH	
SPEC. COND.(μMHOs/CM)	
OTHER (UNITS)	

WEATHER : SUN, MOD. WIND, 90°

COMMENTS : ALL SAMPLES GRABBED FROM SURFACE.

Recv'd. -7/12/93
RBA.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

JUL 08 1993

Mr. Robert B. Allen
Environmental Manager
Lackawanna Area
Bethlehem Steel Corporation
Box 310
Lackawanna, New York 14218

Re: Bethlehem Steel Corporation - EPA ID No.: NYD002134880
Administrative Order on Consent
Docket No. II RCRA-90-3008(h)-0201

Dear Mr. Allen:

The U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) have completed the review of eight (8) Preliminary Solid Waste Management Units (SWMU) Assessment Reports, submitted by Bethlehem Steel Corporation (BSC). These assessment reports are:

1. Surface Impoundment B (SWMU S-2) dated 8/15/92 ✓
2. Surface Impoundment D (SWMU S-4) dated 8/15/92 ✓
3. Surface Impoundment F (SWMU S-6) dated 8/13/92 ✓
4. Surface Impoundment H (SWMU S-8) dated 8/15/92 ✓
5. Asbestos Landfill (SWMU S-12) dated 8/15/92 ✓
6. Lime Dust & Kish Landfill (SWMU S-18) dated 8/15/92 ✓
7. Landfill AA (SWMU S-19) dated 7/31/92 ✓
8. Surface Impoundment G (SWMU S-7) and Drying Area for Sludge ✓✓ from Impoundment F (SWMU S-20) dated 10/29/92.

In each of the eight Preliminary SWMU Assessment Reports, BSC states that there have been no releases of hazardous wastes or hazardous constituents to the environment as a result of materials stored in the SWMUs. BSC recommends "no further action" for each SWMU.

The agencies disagree with BSC's conclusions in the assessment reports that all these SWMUs do not contain hazardous wastes and are not releasing hazardous constituents to the environmental media, and that no further investigatory action is necessary. Specific comments regarding these reports are attached to this letter. Section 2.0 of the attachment provides a summary of major issues identified during the review of these reports.

BSC needs to fully investigate SWMUs S-2, S-4, S-6, S-8, S-12, S-18, S-19 and S-7/S-20 in the RFI. Therefore, BSC needs to provide a workplan that will characterize the materials associated with each of the SWMUs along with any contamination originating from the SWMUs for agencies review and approval. Such workplan must be provided within 45 days of receipt of this letter.

Should you have any questions, please contact Ms. Maria Jon of the EPA at (212) 264-9397 and Mr. Larry Thomas of the NYSDEC at (518) 457-9255.

Sincerely yours,

Barry [illegible] for A.B.

Andrew Bellina, P.E.
Chief, Hazardous Waste Facilities Branch
Air & Waste Management Division
USEPA, Region II

Barry [illegible] for P.C.

Paul R. Counterman, P.E.
Chief, Bureau of Western Hazardous Waste Programs
Division of Hazardous Substances Regulation
New York State Department of Environmental Conservation

Enclosures

cc: Stanley Radon, NYSDEC, Region 9 w/encls.
Roger Murphy, NYSDEC w/encls.
Larry Thomas, NYSDEC w/encls.

2.0 SUMMARY OF MAJOR ISSUES

In each of the eight Preliminary SWMU Assessment Reports BSC states that there have been no releases of hazardous wastes or hazardous constituents to the environment as a result of materials stored in the SWMU. BSC recommends "no further action" for each SWMU based on one or more of the following claims:

- there is no record of hazardous wastes or constituents being deposited in the SWMU, and/or wastes deposited in the SWMU do not exhibit hazardous waste characteristics;
- analytical testing conducted on samples collected from the SWMU demonstrated that no hazardous constituents are present at or above appropriate regulatory levels; and
- RFI ground water monitoring data indicate that there exists no impact on ground water quality as a result of materials placed in the unit.

Several significant problems were identified regarding BSC's conclusions and recommendations for "no further action," including:

- Sufficient data exist to indicate that hazardous wastes and/or constituents were deposited in each SWMU. The RCRA Facility Assessment and other references on steel industry wastes (EPA, 1982; EPA, 1979) indicate that the materials deposited in SWMUs S-2, S-4, S-6, S-12, and S-7/S-20 contain hazardous constituents and/or wastes that are of concern to EPA; and that SWMUs S-8, S-18, and S-19 are suspected to contain hazardous constituents.

  In addition, Toxicity Characteristic Leaching Procedure (TCLP) and Extraction Procedure (EP) Toxicity[1] results confirm the presence of several hazardous constituents in SWMUs S-2, S-4, S-6, S-19, and S-7/S-20. The constituents detected include toluene, 1,1,1-trichloroethane, arsenic, barium, cadmium, chromium, lead, mercury, and selenium.

  Finally, data presented in Appendix A of the Preliminary SWMU Assessment Report for SWMU S-7/S-20 show samples collected from

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[1] The TCLP data provided in the Preliminary SWMU Assessment Reports for SWMUs S-2, S-4, S-6, and S-7/S-20 are questionable. It appears that the TCLP extraction holding times for the majority of the parameters were exceeded. Thus, the TCLP results presented in these assessment reports are likely to be underestimates. In addition, the TCLP and EP Toxicity volatile organic compound results for SWMUs S-2, S-4, S-6, S-8, and S-7/S-20 are questionable and may also be underestimates because the samples were composited.

SWMUs S-2, S-4, S-6, and S-7 with lead levels ranging from 800 to 4000 parts per million (ppm).

- The analytical data presented in the Preliminary SWMU Assessment Reports do not demonstrate the absence of hazardous constituents at or above appropriate regulatory levels for any of the SWMUs. For SWMUs S-2, S-4, S-6, S-8, S-18, S-19, and S-7/S-20, BSC has only provided TCLP and/or EP Toxicity results for one or two composited waste samples. These methods are not appropriate for identifying and quantifying all hazardous constituents that may pose a hazard to human health or the environment. No analytical data were provided for SWMU S-12.

- The Phase I RCRA Facility Investigation (RFI) ground water monitoring data indicate that the materials deposited in SWMUs S-4 and S-7/S-20 may be impacting ground water quality. Several hazardous constituents, which could be originating from these SWMUs, have been consistently detected in samples collected from downgradient monitoring wells.

  Whether or not the remaining six SWMUs are impacting ground water cannot be evaluated at the present time, due to the absence of monitoring wells directly downgradient from each of these SWMUs.

Based on the RCRA Facility Assessment, technical references, and BSC's TCLP and EP Toxicity results it is clear that SWMUs S-2, S-4, S-6, S-18, S-19, and S-7/S-20 contain hazardous constituents that could pose a threat to human health and the environment. Therefore, a "no further action" determination for these units is inappropriate.

A "no further action" determination for SWMU S-12 is inappropriate since this unit contains asbestos and may also contain hazardous constituents as a result of other miscellaneous materials that were disposed in the unit. SWMU S-8 may contain hazardous constituents and warrants further investigation as well.

BSC needs to fully investigate SWMUs S-2, S-4, S-6, S-8, S-12, S-18, S-19, and S-7/S-20 in the RFI. The materials associated with each SWMU need to be fully characterized along with any contamination originating from the SWMU.

To adequately characterize the material in each SWMU, a representative number of individual grab samples need to be analyzed for the complete hazardous constituent list (Appendix A of the Phase I Final Work Plan, dated May 1990). The grab samples need to be collected at several locations and depths, including below the vertical extent of the waste. Samples should also be collected from any unique strata identified within the waste.

All samples must be analyzed using EPA-approved standard methods for direct constituent analysis of solid wastes (SW-846), and the resulting analytical data need to be validated according to EPA Region II guidelines.

A sufficient number of downgradient ground water monitoring wells for each SWMU will need to be installed and monitored for the complete hazardous constituent list in order to evaluate the impact of each SWMU on ground water quality. The monitoring wells need to be located as close as possible to each SWMU and screened at intervals which will directly intercept any contamination emanating from the SWMU.

The above comments as well as the comments provided in the following sections need to be considered and implemented as appropriate in the upcoming phases of the RFI.

3.0 REVIEW OF PRELIMINARY SWMU ASSESSMENT REPORT - SURFACE IMPOUNDMENT B (SWMU S-2)

3.1 General Comments

BSC states that there have been no releases of hazardous wastes or hazardous constituents to the environment as a result of materials stored in SWMU S-2, and therefore, recommends "no further action." This recommendation is inappropriate for the following reasons:

- SWMU S-2 was identified during the RCRA Facility Assessment because waste streams from WQCS Nos. 3, 7, and 9 were deposited in the unit. The RCRA Facility Assessment and other references on steel industry wastes indicate that the waste streams from these WQCSs contain listed hazardous constituents and wastes. Other wastes normally put in other impoundments may have been disposed of in this unit as well.

- Although the material in SWMU S-2 has not yet been analyzed for total hazardous constituents, the EP Toxicity and TCLP results presented in Appendix B of the Preliminary SWMU Assessment Report demonstrate the presence of hazardous constituents in composited samples collected from SWMU S-2. The constituents detected include toluene, 1,1,1-trichloroethane, barium, lead, and selenium.

- Data presented in Appendix A of the Preliminary SWMU Assessment Report for SWMU S-7/S-20 indicate that samples collected from borings installed in SWMU S-2 contain up to 1,700 ppm of lead.

3.2 Page-Specific Comments

Page 4, ¶3	No boring logs have been included in the report. BSC must present all boring logs to document the depth of the waste, depth to ground water, and other subsurface conditions encountered at SWMU S-2.

In addition, all sampling locations and depths must be identified on the boring logs.

Page 6, ¶2 BSC has not adequately characterized the contents of SWMU S-2. BSC has only provided TCLP and/or EP Toxicity results for two composited waste samples.

To adequately characterize the material at SWMU S-2, a representative number of individual grab samples need to be collected and analyzed for the complete hazardous constituent list (Appendix A of the Phase I Final Work Plan, dated May 1990). The grab samples should be collected at several locations and depths, including below the vertical extent of the waste. Samples should also be collected from any unique strata identified within the waste.

The samples must be analyzed using EPA-approved standard methods (SW-846). Additionally, the analytical data should be validated according to EPA Region II guidelines.

Page 6, ¶3 Compositing of samples is not recommended for the characterization of wastes unless samples are accompanied by an appropriate number of grab samples. Data from composited samples may not truly be representative of the waste. In addition, samples collected for volatile organic compound analyses must not be composited.

Page 8, ¶1 The TCLP data provided in Appendix B of the report are questionable. It appears that the TCLP extraction holding times for the majority of the parameters were exceeded. Additionally, all of the volatile organic compound data presented in Appendix B are questionable since the samples were composited.

Page 8, ¶2 This paragraph states that toluene was the only organic constituent detected in any of the samples analyzed for EP Toxicity or TCLP, and it was detected at a concentration of 6 parts per billion (ppb) in the TCLP extract. However, the TCLP analytical results presented in Appendix B indicate that toluene was detected at a concentration of 90 ppb in the TCLP extract. In addition, 1,1,1-trichloroethane (1,1,1-TCA) was detected (at a concentration of 6 ppb) in the TCLP extract.

There are currently no monitoring wells (including those installed in the Phase I RFI and those proposed for Phase II) that would intercept any contamination originating from SWMU S-2. Therefore, a statement regarding the impact of SWMU S-2 on ground water quality cannot be made at the present time.

The ground water monitoring well MW-2D2 is not located downgradient from SWMU S-2, based on the ground water elevation contours presented in the Phase I Draft Final Report.

Appendix A Page 10, ¶2	The discussion in this paragraph indicates that SWMU S-2 solids contain high concentrations of zinc and lead, yet this is not discussed in the text of the Preliminary SWMU Assessment Report.

4.0 REVIEW OF PRELIMINARY SWMU ASSESSMENT REPORT - SURFACE IMPOUNDMENT D (SWMU S-4)

4.1 General Comments

BSC states that there have been no releases of hazardous wastes or hazardous constituents to the environment as a result of materials placed in SWMU S-4, and therefore, recommends "no further action." This recommendation is inappropriate for the following reasons:

- SWMU S-4 received dredged sediments from Smokes Creek from 1970 to 1980. Due to the variety of discharges to Smoke Creek before and during that period, a wide range of hazardous constituents are potentially present in the sediments that were dredged from Smokes Creek and deposited in SWMU S-4.
- Although the material in SWMU S-4 has not yet been analyzed for total hazardous constituents, the EP Toxicity and TCLP results presented in Appendix B of the Preliminary SWMU Assessment Report demonstrate the presence of hazardous constituents in composited samples collected from SWMU S-4. The constituents detected include toluene, barium, lead, mercury, and selenium.
- Data presented in Appendix A of the Preliminary SWMU Assessment Report for SWMU S-7/S-20 indicate that samples collected from borings installed in SWMU S-4 contain up to 4000 ppm of lead.
- The Phase I RFI ground water monitoring data indicate that the materials deposited in SWMU S-4 may be impacting ground water quality. Numerous hazardous constituents, which could be originating from SWMU S-4, have been consistently detected in samples collected from monitoring well MWS-1. Toluene, which was detected in the TCLP extract from SWMU S-4 samples, was detected in MWS-1 ground water samples during all five quarters of ground water monitoring.

4.2 Page-Specific Comments

Page 4, ¶2 BSC cannot assume that the nature of sediments currently present in Smokes Creek are representative of sediments dredged from the creek and stored in SWMU S-4 in the past. Smokes Creek received wastes from the cold strip mill, the hot strip mill, the galvanizing mill, the oxygen plant, and scrubber waste from Basic Oxygen Furnace BOF operations until 1970.

After 1970, Smokes Creek reportedly received only discharges from WQCS No. 3 and the BOF Final Thickener. Since the early 1970s until May 30, 1980, sediments were dredged from Smokes Creek and deposited in SWMU S-4. Considering the history of discharges to Smokes Creek, it would be expected that sediments deposited in Smokes Creek prior to 1970 would be more likely to contain higher levels of hazardous constituents than the sediments deposited after 1970, when untreated discharges from the cold strip mill, hot strip mill, galvanizing mill, oxygen plant, and BOF scrubber were eliminated.

Sediments dredged during the 1970s would, therefore, be more likely to contain hazardous constituents. BSC needs to characterize the wastes/dredged sediments deposited in SWMU S-4 through collection and analyses of individual grab samples of these wastes/dredged sediments, and not through comparison to analytical results from the sediments that are currently present in Smokes Creek.

It should be noted that the Smokes Creek sediment samples collected in the Phase I RFI were analyzed using TCLP only. Thus, the hazardous constituents currently present in Smokes Creek sediments have not be adequately identified and quantified. Additionally, the TCLP results confirm that there are several hazardous constituents present in Smokes Creek sediments, including benzene, toluene, xylene, barium, lead, and selenium.

Page 5, ¶1 BSC has not adequately characterized the contents of SWMU S-4. BSC has only provided TCLP and/or EP Toxicity results for two composited waste samples.

To adequately characterize the contents of SWMU S-4, a representative number of individual grab samples need to be collected and analyzed for the complete hazardous constituent list. The grab samples should be collected at several locations and depths, including below the vertical extent of the waste. Discrete samples, which are representative of the sediments deposited in SWMU S-4 in the early 1970s, must be collected and characterized for total hazardous constituents. Samples should also be collected from any unique strata identified within the waste.

Page 5, ¶2 Compositing of samples is not recommended for the characterization of wastes unless samples are accompanied by an appropriate number of grab samples. Data from composited samples may not truly be representative of the waste. In addition, samples collected for volatile organic compound analysis must not be composited.

BSC has not included any boring logs for the borings completed at SWMU S-4. BSC must present all boring logs to document the depth of the waste, depth to ground water, and other subsurface conditions. All sampling locations and depths must be identified on the boring logs as well.

Page 5, ¶3 The TCLP data provided in Appendix B of the report are questionable. It appears that the TCLP extraction holding times for the majority of the parameters were exceeded.

Page 6, Figure 5.0 BSC's rationale for the selection of boring locations is unclear. The boring locations shown on Figure 5.0 do not appear to provide a uniform coverage of the SWMU S-4. The rationale for all future boring locations for this SWMU and all others needs to be presented in the RFI Report. The rationale must be technically defensible.

Page 7, ¶2 The ground water monitoring data presented in the Phase I Draft Final Report indicate that the materials deposited in SWMU S-4 may be impacting ground water quality. Numerous hazardous constituents have been consistently detected in MWS-1 ground water samples. Toluene, which was detected in the TCLP extract from SWMU S-4 samples, was detected in MWS-1 ground water samples during all five quarters of RFI monitoring.

It should also be noted that MWS-1 may not be directly downgradient of SWMU S-4. The ground water elevation contours presented in the Phase I Draft Final Report indicate that ground water flow in the vicinity of SWMU S-4 is towards Smokes Creek. Additional monitoring wells will need to be optimally placed to intercept ground water flowing from SWMU S-4 towards Smokes Creek.

Additionally, direct hydraulic connection between SWMUs S-11 and S-22 and MWS-1 is not apparent based on the ground water elevation contours presented in the Phase I Draft Final Report.

5.0 REVIEW OF PRELIMINARY SWMU ASSESSMENT REPORT - SURFACE IMPOUNDMENT F (SWMU S-6)

5.1 General Comments

BSC states that there have been no releases of hazardous wastes or hazardous constituents to the environment as a result of materials stored in SWMU S-6, and therefore, recommends "no further action." This recommendation is inappropriate for the following reasons:

- SWMU S-6 was identified in the RCRA Facility Assessment because sludges/wastes from WQCSs Nos. 3 and 7 were deposited in this unit. The RCRA Facility Assessment and other references on steel industry wastes indicate that the sludges/wastes from these WQCSs contain listed hazardous constituents. Other wastes normally put in other impoundments may have been disposed of in this unit as well.

- Although the material in SWMU S-6 has not yet been analyzed for total hazardous constituents, the EP Toxicity and TCLP results presented in Appendix B of the Preliminary SWMU Assessment Report indicate the presence of hazardous constituents in composited samples collected from SWMU S-6, including toluene, barium, lead, and selenium.

- The data presented in Appendix A of the Preliminary SWMU Assessment Report for SWMU S-7/S-20 indicate that samples collected from borings installed in SWMU S-6 contain up to 1,000 ppm of lead.

5.2 Page-Specific Comments

Page 2, ¶4	BSC has not identified the specific hazardous constituents associated with the wastes disposed of in this SWMU. BSC has only identified the major components (on a weight percentage basis) of the waste streams from WQCS Nos. 3 and 7.
Page 4, ¶3	BSC has not included any boring logs for borings completed at SWMU S-6. BSC must present all boring logs to document the depth of the waste, depth to ground water, and other subsurface conditions. Additionally, all sampling locations and depths must be identified on the boring logs.
Page 6, ¶1	BSC's analytical testing program has not adequately characterized the contents of SWMU S-6. BSC has only conducted TCLP and/or EP Toxicity test on two composited waste samples. To adequately characterize the contents of SWMU S-6, a representative number of individual grab samples need to be collected and analyzed for the complete hazardous constituent list. The grab samples should be collected at several locations and depths, including below the vertical extent of the waste. Samples

should also be collected from any unique strata identified within the waste.

Page 6, ¶2 As mentioned in previous comments, compositing of samples is not recommended for the characterization of wastes unless the samples are accompanied by an appropriate number of grab samples.

The Lancaster Laboratories TCLP data provided in Appendix B are questionable. It appears that the TCLP extraction holding times for most of the parameters have been exceeded. Additionally, all of TCLP volatile organic compound data presented in Appendix B are questionable since the samples were composited.

Page 6, ¶3 BSC incorrectly states that toluene was detected at a concentration of 11 ppb in a sample from the March 1988 sampling event. The analytical results presented in Appendix B indicate that toluene was actually detected at a concentration of 110 ppb, not 11 ppb.

Page 7, Figure 5.0 BSC's rationale for the selection of boring locations is unclear. The boring locations shown on Figure 5.0 do not appear to be uniformly located over the areal extent of SWMU S-6. Boring locations should be selected which provide a uniform aerial coverage of the SWMU.

Page 8, ¶1 The Phase I RFI ground water monitoring data indicate that SWMU S-6 may be impacting ground water quality. Barium and toluene, two constituents detected in the TCLP extract of SWMU S-6 samples, have been detected in the downgradient monitoring well MWS-15. However, MWS-15 is located more than 400 feet from SWMU S-6 with SWMU S-5 located in between. Since SWMU S-5 may also be impacting ground water quality, a definitive statement cannot be made regarding SWMU S-6. Additional ground water monitoring wells need to be installed and monitored in order to adequately evaluate the impacts of SWMU S-6 on ground water quality.

Page 8, ¶2 The alkaline nature of the SFA may help to reduce the leachability of certain constituents from the wastes into the ground water; however, the leachability of certain other constituents may be enhanced or may not be affected at all as a result of the alkaline nature of the SFA (e.g., toluene). The impact of high alkalinity on the fate and transport of hazardous constituents is a complex issue and needs to be fully investigated in the upcoming phases of the RFI.

Appendix B The Lancaster Laboratory data sheets indicate that samples were submitted for analysis on November 9, 1988, which is over two months after they were collected. Therefore, it appears that the TCLP extraction holding times were not met for the majority of analyses, since the TCLP extraction holding time for volatile organic compounds is 14 days, semi-volatile organic compounds is 40 days, and mercury is 28 days.

6.0 REVIEW OF PRELIMINARY SWMU ASSESSMENT REPORT - SURFACE IMPOUNDMENT H (SWMU S-8)

6.1 General Comments

~~BSC states that there have been no releases of hazardous wastes or hazardous constituents to the environment from SWMU S-8, and therefore, recommends "no further action." The information provided in the Preliminary SWMU Assessment Report does not substantiate this recommendation.~~

~~The RCRA Facility Assessment states that the dikes of this unit were constructed using fine-grained materials suspected of containing hazardous constituents. BSC's Preliminary SWMU Assessment Report neither confirms nor negates this finding.~~

6.2 Page-Specific Comments

~~Page 2, ¶2 BSC has not fully characterized the nature of the materials which were used to construct the embankments of SWMU S-8. BSC states that the embankments of this surface impoundment were constructed using primarily blast furnace slag bricks and material that fit the description of construction debris. This statement suggests that other miscellaneous materials were used in the construction. BSC needs to fully characterize all materials in the embankments.~~

~~BSC has not presented any discussion regarding the dimensions and construction of the embankments of SWMU S-8. This information needs to be provided to assist in the characterization and evaluation of this SWMU.~~

~~Page 2, ¶4 BSC's analytical testing has not adequately identified and quantified the hazardous constituents that may be present in the embankments of SWMU S-8. BSC has only provided TCLP results for one composited sample.~~

~~To adequately characterize the embankments, a representative number of individual grab samples need to be collected and analyzed for the complete hazardous constituent list. The grab samples should be collected at several locations and depths,~~

Page 4, ¶4 ~~It is unlikely that a site inspection could definitively determine that hazardous materials/constituents were not present in the pile which comprises SWMU S-19. Although a site inspection could provide information regarding the general conditions at the site and nature of the materials present at the surface of the pile (e.g., whether or not stained soils or drums or waste are visible), it would likely provide little information regarding the nature of subsurface materials.~~

~~In addition, although the results of a visual site inspection may indicate that contamination is not present, sampling and analyses of representative samples must be conducted to verify that hazardous constituents are, in fact, absent.~~

10.0 REVIEW OF PRELIMINARY SWMU ASSESSMENT REPORT - SURFACE IMPOUNDMENT G AND DRYING AREA FOR SLUDGE FROM IMPOUNDMENT F (SWMU S-7/S-20)

10.1 General Comments

BSC concludes that there have been no releases of hazardous wastes or hazardous constituents to the environment from SWMU S-7/S-20, and therefore, recommends "no further action." This recommendation is inappropriate for the following reasons:

- SWMU S-7/S-20 was identified as a concern in the RCRA Facility Assessment because waste streams from WQCS Nos. 3 and 7 were deposited in the unit. The RCRA Facility Assessment and other references on steel industry wastes indicate that the waste streams from these WQCSs contain listed hazardous constituents and wastes. Other wastes normally put in other impoundments may have been disposed of in this unit as well.

- Although the material in SWMU S-7/S-20 has not yet been analyzed for total hazardous constituents, the EP Toxicity and TCLP results presented in Appendix A of the Preliminary SWMU Assessment Report demonstrate the presence of hazardous constituents in samples collected from or deposited in SWMU S-7/S-20. The constituents detected include toluene, arsenic, barium, cadmium, chromium, lead, mercury, and selenium. Additionally, constituent analysis of samples collected from SWMU S-7 show up to 1,300 ppm of lead.

- The Phase I RFI ground water monitoring data indicate that the materials deposited in SWMU S-7/S-20 may be impacting ground water quality. — Numerous hazardous constituents, which could be originating from SWMU S-7/S-20, have been consistently detected in samples collected from downgradient monitoring wells MWS-15, MW-2U, and MWS-11A. Toluene and barium, two constituents detected in the TCLP extract of SWMU S-7/S-20 samples, have been detected in these wells.

10.2 Page-Specific Comments

Page 6, Figure 3.0 — Figure 3.0 does not differentiate between the fill consisting of steelmaking slag and the wastes which have been deposited in each individual SWMU. BSC should indicate the depth of waste deposited in SWMU S-7/S-20 on Figure 3.0 to demonstrate the relationship between the waste, the slag fill, and the ground water table.

The geologic cross-section A-A' depicted in Figure 3.0 is inconsistent with the cross-section A-A' indicated on Figure 2.0. Figure 3.0 indicates that geologic data obtained from borings for monitoring wells MWS-9, MW2-U1, MWS-12A, MWS-12B, and MWS-4 were used to develop the geologic cross-section shown. However, Figure 2.0 indicates that only data from the borings for monitoring wells MWS-9, MWS-12A, and MWS-12B were used. The geologic data from the four borings installed in SWMU S-7/S-20 should be utilized in the development of the geologic cross-section.

Page 10, ¶5 — Compositing of samples is not recommended for the characterization of wastes unless samples are accompanied by an appropriate number of grab samples. Data from composited samples may not truly be representative of the waste. Samples collected for volatile organic compound analysis must not be composited.

Page 12, ¶3 — BSC has not adequately identified the hazardous constituents contained in the wastes. BSC has only conducted TCLP analysis on one composited waste sample, and EP Toxicity metal analysis on wastes deposited in the unit. Total constituent analysis has been performed for only a limited number of constituents.

To adequately identify and quantify the hazardous constituents contained in the material at SWMU S-7/S-20, a representative number of individual grab samples need to be collected and analyzed for the complete hazardous constituent list. The grab samples should be collected at several locations and depths, including below the vertical extent of the waste. Samples should also be collected from any unique strata identified within the waste.

Page 12, ¶5 Analytical data presented in Appendix B for the January 1992 sampling event indicate that barium was detected at a concentration of 451 ppb in MWS-15. Barium has also been detected in leachate from sludge generated by WQCS Nos. 3 and 7 and in leachate from composite samples collected from borings advanced at SWMU S-7/S-20.

Page 12, ¶6 Organics are present in the sludge deposited in SWMU S-7/S-20. The analytical data presented in Appendix A confirm the presence of toluene.

Also, since samples from SWMU S-7, were analyzed by TCLP and not by a direct analysis method, only statements about the presence of contaminants in the TCLP extract, and not the sludge, are appropriate.

Page 17, ¶4 The cap will limit the amount of precipitation infiltrating through the fill material but will not "isolate the unit from ground water," as BSC states.

Appendix A The Lancaster Laboratory data sheets indicate that samples were submitted for analysis on November 9, 1988, which is over two months after they were collected. Therefore, it appears that the TCLP extraction holding times were not met for the majority of analyses, since the TCLP extraction holding time for volatile organic compounds is 14 days, semi-volatile organic compounds is 40 days, and mercury is 28 days.

REFERENCES

Dames & Moore. May 1990. *Final Work Plan for Phased Site Investigation, Bethlehem Steel Corporation and Preliminary Solid Waste Management Unit (SWMU) Assessment Plan.*

National Enforcement Investigations Center (NEIC). September 1988. *RCRA Facility Assessment, Bethlehem Steel Corporation, Lackawanna Plant, Lackawanna, New York.* EPA/330/2-88-054.

U.S. EPA Office of Water. December 1992. *Drinking Water Regulations and Health Advisories.*

U.S. EPA and New York State Department of Environmental Conservation (NYSDEC). March 1993. EPA and NYSDEC Technical Review of the Draft Final Report, Phased Site Investigation, Phase I, Bethlehem Steel Corporation, Lackawanna, New York.

U.S. EPA. Region II Monitoring Measurements Branch. January 1992. *Evaluation of Metals Data for the Contract Laboratory Program.* SOP No. HW-2, Revision 11.

U.S. EPA. Region II Monitoring Measurements Branch. January 1992. *Contract Laboratory Program Organics Data Review and Preliminary Review.* SOP No. HW-6, Revision 8.

U.S. EPA. August 1990. *Administrative Order on Consent.* Docket No. II RCRA-90-300(h)-0201.

U.S. EPA. May 1989. *Interim Final RCRA Facility Investigation (RFI) Guidance, Volumes I through 4.* EPA/530/SW-89-031.

U.S. EPA. October 1986. *RCRA Facility Assessment Guidance.* EPA/530-86-053.

U.S. EPA. May 1982. *Development Document for Effluent Limitations Guidelines and Standards for the Iron and Steel Manufacturing Point Source Category, Volumes I through IV.* EPA 440/1-82/024.

U.S. EPA. April 1979. *Environmental and Resource Conservation Considerations of Steel Industry Solid Waste.* EPA-600/2-79-074.

DECLARATION
OF
CONDITIONS, COVENANTS AND RESTRICTIONS

Made By: Bethlehem Steel Corporation
1170 Eighth Avenue
Bethlehem, Pennsylvania 18016-7699

Dated: February 20, 1996

RRC 975

779-17

DECLARATION OF CONDITIONS, COVENANTS AND RESTRICTIONS

THIS DECLARATION OF CONDITIONS, COVENANTS AND RESTRICTIONS, made this 20th day of February, 1996, by Bethlehem Steel Corporation, a corporation duly formed and existing under the laws of the State of Delaware, authorized to do business in the State of New York, and having its principal place of business in the City of Bethlehem, Lehigh County, Pennsylvania, with a mailing address of 1170 Eighth Avenue, Bethlehem, Pennsylvania 18016-7699 (hereinafter "BSC"),

WITNESSETH:

WHEREAS, BSC is the owner of certain noncontiguous lands adjacent to the eastern shore of Lake Erie situate partly in the City of Lackawanna, partly in the Town of Hamburg and partly in the Village of Blasdell, all in the County of Erie, State of New York, containing in the aggregate approximately 1,215 acres, and encompassing approximately 2.5 miles in an approximate north-south direction and approximately 1.4 miles in an approximate east-west direction, which were formerly part of the site of an integrated steel plant, and a portion of which lands is described and delineated more particularly in SCHEDULE B herein (said portion shall be hereinafter referred to as the "Premises"); and

WHEREAS, the history of the Premises is described more fully in SCHEDULE A herein; and

WHEREAS, certain governmental agencies and BSC have conducted environmental investigations at and near the Premises, the scope, result and impact of each of which are described more fully in SCHEDULE A herein; and

WHEREAS, BSC seeks to impose conditions, covenants and restrictions on the Premises for the purpose of promoting, benefitting, preserving and protecting the health and safety of the public and the environment all as related to the foregoing.

NOW, THEREFORE, (i) BSC, on behalf of itself, its successors and assigns, hereby declares and (ii) each and every person or entity who shall be an owner of the Premises or any part thereof, hereby covenants and agrees on behalf of itself, its successors and assigns, that the Premises or any part thereof shall be held, transferred, sold, conveyed, occupied and developed subject to the following conditions, covenants and restrictions:

1. The Premises or any part thereof shall be limited to industrial use only, which shall include manufacturing, assembling, warehousing, and related railroad, port and shipping activities, together with office space and other facilities including laboratories incidental to such uses, but incidental uses such as day care centers, nursery schools or other facilities that are designed or intended to be primarily for use or occupancy by multiple numbers of persons under the age of eighteen (18) years shall not be permitted.

2. No wells for the extraction or use of water from beneath the surface of the Premises or any part thereof shall be installed, built, permitted or utilized on the Premises or any part thereof for any purpose whatsoever; provided, however, that BSC may install, use, operate and maintain monitoring wells and treatment wells, including the extraction and treatment of water therefrom, solely for the purpose of monitoring, treating or remediating such water; and provided, further, that any other owner of the Premises or any

part thereof may install, use, operate and maintain monitoring wells and treatment wells, including the extraction and treatment of water therefrom, on the part of the Premises so owned by such owner, solely for the purpose of monitoring, treating or remediating such water.

3. Any activity or use not specifically permitted hereby or any activity prohibited pursuant hereto shall be forbidden.

A. <u>Purpose</u>.

It is the intent of BSC by means of said conditions, covenants and restrictions to promote, benefit, preserve and protect the health and safety of the public and the environment by preventing any activity or use not specifically permitted above or any activity prohibited pursuant to paragraphs 1 and 2 above.

B. <u>Conditions, Covenants and Restrictions to Run with the Premises</u>.

Said conditions, covenants and restrictions shall run with the Premises and every part thereof and shall bind all owners and occupiers of the Premises or any part thereof, and their respective successors and assigns; all parties claiming by, through, or under them or any of them shall be taken to hold, agree and covenant with all owners of the Premises or any part thereof, and their respective successors and assigns and each of them, to conform to and observe said conditions, covenants and restrictions.

C. <u>Enforceability</u>.

Said conditions, covenants and restrictions shall inure to the benefit of and be enforceable by BSC and by each and every person or entity, including BSC, who shall be an owner of the Premises or any part thereof, and their respective successors and assigns, and shall also benefit BSC, its successors and assigns, for so long as BSC shall (i) own any property either adjacent or proximal to the Premises or any part thereof or (ii) be responsible under any law, ordinance, rule or regulation for the presence of hazardous wastes or hazardous constituents or both upon or within the Premises or any part thereof or in said property adjacent or proximal to the Premises or any part thereof but said conditions, covenants and restrictions shall not give rise, by implication or otherwise, to a reciprocal condition, covenant or restriction burdening or binding upon the other lands or any part thereof of BSC benefitted hereby, by actions at law or by suits in equity. As it may be impossible to measure monetarily the damages which may accrue to the beneficiaries hereunder by reason of a violation of this Declaration, any beneficiary hereunder shall be entitled to relief by way of injunction or specific performance, as well as any other relief available at law or in equity, to enforce the provisions hereof.

The failure of any beneficiary hereunder to enforce any provision of this Declaration shall in no event be construed as a waiver of the right of that beneficiary or any other beneficiary hereunder to do so thereafter, as to the same or a similar violation occurring prior or subsequent thereto. No liability shall attach to BSC or any subsidiary or other affiliate of BSC (or any officer, director, employee, member, agent, committee or committee member of any of them) or to any other beneficiary hereunder (excepting, however, the subject owner in breach) for failure to enforce the provisions of this Declaration.

If BSC or any other beneficiary hereunder successfully brings an action to extinguish a breach or otherwise enforce the provisions of this Declaration, the costs of such action, including legal fees, shall become a binding, personal obligation of the owner in breach.

D. Amendments and Termination.

Any amendment or termination of this Declaration affecting any part of the Premises shall require the written consent of all owners of the Premises or any part thereof, which consent shall not be unreasonably withheld, and of BSC, or its successors or assigns, whose consent may be withheld in its sole discretion.

Any amendment or termination of this Declaration shall not become effective until the instrument evidencing such change has been duly recorded in the Erie County Clerk's Office.

Neither this Declaration nor any amendment to this Declaration shall be interpreted as permitting any action or thing prohibited by the applicable laws, ordinances, rules or regulations of any governmental authority having jurisdiction over the part of the Premises affected or by specific restrictions imposed by any other instrument relating to the Premises or to such part of the Premises.

No change of conditions or circumstances shall operate to amend this Declaration, and this Declaration may be amended only in the manner provided herein.

The determination by any court of competent jurisdiction that any provision of this Declaration is unenforceable invalid or void shall not affect the enforceability or validity of any other provision hereof.

IN WITNESS WHEREOF, BSC has executed this Declaration as of the day and year first above written.

BETHLEHEM STEEL CORPORATION,
by

ATTEST:

RJ Masten
Assistant Secretary

A.E. Moffitt, Jr.
Vice President

COMMONWEALTH OF PENNSYLVANIA)
) SS.:
COUNTY OF LEHIGH)

On the 20th day of February, 1996, before me personally came A. E. Moffitt, Jr., to me known, who, being by me duly sworn, did depose and say that he resides at 3850 Brandeis Avenue, Bethlehem, Pennsylvania 18017; that he is a Vice President of Bethlehem Steel Corporation, the corporation described in and which executed the above instrument; and that he signed his name thereto by authority of the By-laws of said corporation.

Dorothy A. Midash
Notary Public

NOTARIAL SEAL
Dorothy A. Midash, Notary Public
City of Bethlehem, Lehigh County, Pa.
My Commission Expires Dec. 7, 1996

SCHEDULE A
HISTORY OF THE PREMISES

The Premises were formerly part of the site (the "Site") of an integrated steel plant for iron and steel production, which plant consisted of blast furnaces, coke batteries, basic oxygen and open hearth steelmaking furnaces, a sinter plant, rolling mills, and finishing mills (includes a galvanizing line). Iron and steel production ceased in October 1983. Thus, as of the date hereof, the only operations remaining in service are coke batteries and a galvanizing line both of which are located on lands of BSC other than the Premises. The approximate western nine-tenths (9/10) of the Premises (the "Fill Area") are "man-made" land, having been filled by the deposition of various constituents hereinafter described to an average elevation of about 30 feet above Lake Erie mean water level.

A Resource Conservation and Recovery Act ("RCRA") Facility Assessment ("RFA") conducted in 1988 by the U.S. Environmental Protection Agency (the "EPA") and National Enforcement Investigation Center ("NEIC") identified certain solid waste management units ("SWMUs") some of which are located within the Premises. Said SWMUs may have received various wastes or substances, and several water courses, portions or all of which may be on the Premises or on lands adjacent to the Premises, may have been impacted by releases from SWMUs. Pursuant to Section 3008(h) of RCRA, BSC and the EPA entered into an Administrative Order on Consent dated August 13, 1990 ("AOC"), which directed BSC to perform a phased site-wide RCRA

Facility Investigation to determine the nature and extent of any releases of hazardous wastes or hazardous constituents or both from SWMUs into soils, groundwater, sediment, and surface water at or near the Premises.

Documentary information with respect to the types and locations of SWMUs, and any areas of the Premises (or adjacent to the Premises) that may have been impacted by releases of hazardous wastes or hazardous constituents or both from SWMUs, can currently be obtained from documents submitted to (1) the EPA Region II New York office (currently at Hazardous Waste Facilities Branch, Air and Waste Management Division, U.S. Environmental Protection Agency, Region II, 22nd Floor, 240 Broadway, New York, New York 10007-1866), and (2) the New York State Department of Environmental Conservation (the "DEC") at its Albany, New York office (currently at 50 Wolf Road, Albany, New York 12233), and its Region 9 office at Buffalo, New York (currently at 270 Michigan Avenue, Buffalo, New York 14208-2999). Such documentary information (the "Documentary Information") includes but is not limited to the following:

A. Letter from BSC to EPA Region II, dated September 25, 1986, together with attachments, concerning Response to Information Request Pursuant to RCRA Section 3007, Bethlehem Steel Corporation: Lackawanna, New York;

B. United States Environmental Protection Agency Region II, Administrative Order on Consent, Docket No. II RCRA-90-3008(h)-0201, In the Matter of Bethlehem Steel Corporation, Lackawanna, New York 14218-0310, EPA I.D. No. NYD002134880, dated August 13, 1990, together with attachments;

C. Draft Final Report Phased Site Investigation, Bethlehem Steel Corporation, Lackawanna, New York, Phase I, dated August 14, 1992; and

D. Draft Final Report Phased Site Investigation, Bethlehem Steel Corporation, Lackawanna, New York, Phase II-A, dated June 29, 1993, together with appendices.

BSC records and aerial photographs dating from 1938 to the present indicate that the Fill Area (as more specifically identified in the Documentary Information, covering the westward advancement of the Lake Erie shoreline that forms the westerly line of the Premises) was used for the disposal from the Premises and from certain other lands located in Erie County, New York (some of which lands are currently owned by BSC and others of which are formerly of BSC or its predecessors in interest that were sold prior to the date hereof), of (i) excess blast furnace and steelmaking slag, (ii) waste materials, including sludges from wastewater treatment plants, other sludges, dusts and liquids from steel finishing, steel forming, steelmaking, ironmaking and coke-making operations, and (iii) dredge materials from Smokes Creek, which creek bisects the Fill Area. The Fill Area has also been the site of coal storage piles and disposal areas for general debris from the Premises, the Site, said other lands of BSC, and said former lands of BSC. Disposal activities in the Fill Area have ceased, one disposal unit (located on the Premises) has been certified closed by the DEC and two are undergoing review by the hazardous waste delisting group of the EPA for designation as nonhazardous disposal units.

Further information with respect to past activities at the Premises, current activities, previous environmental investigations, current environmental investigations, groundwater quality, settings and classifications of identified SWMUs, areas of possible environmental concern, topography, and geology, hydrogeology, human health and environmental impacts (with respect to the Premises and regionally), can be obtained from the Documentary Information and other documents submitted to the EPA and the DEC at the above-identified locations.

SCHEDULE B
LEGAL DESCRIPTION OF THE PREMISES

All that tract of land situate partly in the City of Lackawanna and partly in the Town of Hamburg, Erie County, New York, being parts of Lots 12, 13, 16, 17 and 18 of the Ogden Gore Tract, parts of Lots 23 and 24, Township 10, Range 8, of the Buffalo Creek Reservation, and lands now or formerly under the waters of Lake Erie and more particularly bounded and described as follows:

BEGINNING at a TRUE POINT OF BEGINNING, the location of which is ascertained as follows: Beginning on the Buffalo Harbor Line dated August 17, 1903 at the northwesterly corner of the tract of land that was remised, released and quitclaimed by said Bethlehem Steel Corporation to Gateway Trade Center Inc. by Indenture dated December 31, 1985, and recorded on December 31, 1985 in the Erie County Clerk's Office in Liber 9530 of Deeds, at page 385, and which Indenture was, in part, corrected by Corrective Indenture between said Bethlehem Steel Corporation and said Gateway Trade Center Inc. dated May 1, 1995, and recorded on May 16, 1995 in said Office in Liber 10886 of Deeds, at page 1064; thence, along said Buffalo Harbor Line, South fifty degrees one minute forty-five seconds West (S. 50° 01′ 45″ W.) three hundred seventy-nine and fifty-four one-hundredths (379.54) feet to a corner of lands reputedly owned by The United States of America; thence, along said last-mentioned lands, the following two (2) courses and distances: (1) South fifty-four degrees two minutes thirty-five seconds West (S. 54° 02′ 35″ W.) two hundred and no one-hundredths (200.00) feet and (2) North thirty-five degrees fifty-seven minutes twenty-five seconds West (N. 35° 57′ 25″ W.) thirty-five and eighty-three one-hundredths (35.83) feet to lands reputedly owned by The People of the State of New York; thence, along the southerly line of said last-mentioned lands, South seventy-one degrees twenty-three minutes thirty-five seconds West (S. 71° 23′ 35″ W.) seven hundred thirty-eight and no one-hundredths (738.00) feet to said TRUE POINT OF BEGINNING; thence, along other lands of said Bethlehem Steel Corporation, the following six (6) courses and distances: (1) South eighteen degrees thirty-six minutes twenty-five seconds East (S. 18° 36′ 25″ E.) four thousand six hundred fifty and no one-hundredths (4650.00) feet, (2) South seventy-one degrees twenty-three minutes thirty-five seconds West (S. 71° 23′ 35″ W.) thirty and no one-hundredths (30.00) feet, (3) South eighteen degrees thirty-six minutes twenty-five seconds East (S. 18° 36′ 25″ E.) one thousand four hundred and no one-hundredths (1400.00) feet, (4) North seventy-one degrees twenty-three minutes thirty-five seconds East

(N. 71° 23′ 35″ E.) one thousand one hundred and no one-hundredths (1100.00) feet, (5) South twenty-seven degrees fifty-six minutes fifty-four seconds East (S. 27° 56′ 54″ E.) five hundred sixty-six and eighty-five one-hundredths (566.85) feet, and (6) South one degree fifty minutes zero seconds East (S. 01° 50′ 00″ E.) one thousand six hundred thirty-nine and no one-hundredths (1639.00) feet to a northerly corner of the tract of land that was granted and released by said Bethlehem Steel Corporation to South Buffalo Railway Company by Indenture dated September 15, 1989, and recorded on December 20, 1989 in said Office in Liber 10119 of Deeds, at page 131; thence, along said last-mentioned tract of land, the following three (3) courses and distances: (1) South sixty-five degrees thirty-two minutes nine seconds West (S. 65° 32′ 09″ W.) eighty-four and eighty one-hundredths (84.80) feet, (2) South twenty-five degrees thirty-one minutes twenty-six seconds East (S. 25° 31′ 26″ E.) twenty and ninety-eight one-hundredths (20.98) feet, and (3) South eighteen degrees thirty-six minutes forty-nine seconds East (S. 18° 36′ 49″ E.) one thousand one hundred twenty and seventy-three one-hundredths (1120.73) feet to the intersection with the southerly line of the City of Lackawanna and the northerly line of the Town of Hamburg; thence, continuing along said last-mentioned tract of land, the following two (2) courses and distances: (1) South eighteen degrees thirty-six minutes forty-nine seconds East (S. 18° 36′ 49″ E.) one thousand five hundred fifty-six and fifty-eight one-hundredths (1556.58) feet and (2) South thirteen degrees forty-six minutes twenty-five seconds East (S. 13° 46′ 25″ E.) one hundred thirty and nine one-hundredths (130.09) feet to the northerly line of the tract of land that was granted and released by said Bethlehem Steel Corporation to Lake Shore Gateway Associates by Indenture dated May 28, 1985, and recorded on May 29, 1985 in said Office in Liber 9450 of Deeds, at page 55; thence, along said last-mentioned tract of land, North eighty-seven degrees thirteen minutes thirty-nine seconds West (N. 87° 13′ 39″ W.) two thousand ninety and no one-hundredths (2090.00) feet to the easterly shoreline of Lake Erie; thence, along said easterly shoreline of Lake Erie, the following eight (8) courses and distances: (1) North sixteen degrees twenty-nine minutes fifty-three seconds West (N. 16° 29′ 53″ W.) two hundred sixty-seven and eighty-three one-hundredths (267.83) feet, (2) North twenty-four degrees twenty-five minutes zero seconds West (N. 24° 25′ 00″ W.) one hundred ninety-five and one one-hundredths (195.01) feet, (3) North twenty-six degrees forty-five minutes zero seconds West (N. 26° 45′ 00″ W.) two hundred fifty and no one-hundredths (250.00) feet, (4) North thirty-one degrees fifteen minutes zero seconds West (N. 31° 15′ 00″ W.) two hundred five and no one-hundredths (205.00) feet, (5) North twenty-one degrees thirty-five minutes zero seconds West (N. 21° 35′ 00″ W.) one hundred ten and no one-hundredths (110.00) feet, (6) North forty-four degrees zero minutes fifty-three seconds West (N. 44° 00′ 53″ W.) twenty-six and thirty-eight one-hundredths (26.38) feet, (7) North thirty-three degrees forty-nine minutes eighteen seconds West (N. 33° 49′ 18″ W.) seventy-four and eighty-six one-hundredths (74.86) feet, and (8) North thirty-four degrees twenty-six minutes twenty-six seconds West (N. 34° 26′ 26″ W.) twelve and no one-hundredths (12.00) feet; thence, along riparian land, North eighteen degrees thirty-six minutes twenty-five seconds West (N. 18° 36′ 25″ W.) six hundred thirty-five and twenty-five one-hundredths (635.25) feet to the intersection with the above-mentioned municipal boundary; thence, continuing along said riparian land, North eighteen degrees thirty-six minutes twenty-five seconds West (N. 18° 36′ 25″ W.) one thousand nine hundred sixty-one and twenty-two one-hundredths (1961.22) feet to the southerly edge of Smokes Creek; thence, along said southerly edge of Smokes Creek, South seventy-one degrees twenty-three minutes thirty-five seconds West (S. 71° 23′ 35″ W.) fifty-eight and sixteen one-hundredths (58.16) feet to the above-mentioned easterly shore line of Lake Erie; thence, crossing the mouth of said Smokes Creek, North sixteen degrees one minute eight seconds West (N. 16° 01′ 08″ W.) seventy and four one-hundredths (70.04) feet to the northerly edge of said Smokes Creek at said easterly shoreline of Lake Erie; thence, continuing along said easterly shoreline of Lake Erie, the following twenty (20) courses and distances: (1) North forty-nine degrees seven minutes zero seconds West (N. 49° 07′ 00″ W.) seventy-nine and no one-hundredths (79.00) feet, (2) North nineteen degrees sixteen minutes zero seconds West (N. 19° 16′ 00″ W.) four hundred twenty-five and no one-hundredths (425.00) feet, (3) North sixteen degrees thirty-seven minutes zero seconds West (N. 16° 37′ 00″ W.) two hundred eighty-five and no one-hundredths (285.00) feet, (4) North twenty-five degrees twenty minutes zero seconds West (N. 25° 20′ 00″ W.) three hundred sixty and no one-hundredths (360.00) feet, (5) North thirty-three degrees zero minutes zero seconds West (N. 33° 00′ 00″ W.) two hundred thirty and no one-hundredths (230.00) feet, (6) North thirty-two degrees forty minutes zero seconds West (N. 32° 40′ 00″ W.) three hundred ten and no one-hundredths (310.00) feet, (7) North twenty-seven degrees ten minutes zero seconds West (N. 27° 10′ 00″ W.) one hundred thirty and no one-hundredths (130.00) feet, (8) North twenty-three degrees twenty minutes zero seconds West (N. 23° 20′ 00″ W.) three hundred fifteen and no one-hundredths (315.00) feet, (9) North eighteen degrees twenty minutes four seconds West (N. 18° 20′ 04″ W.) three hundred two and ninety-two one-hundredths (302.92) feet, (10) North twenty degrees fifteen minutes forty-eight seconds West (N. 20° 15′ 48″ W.) three hundred eighty-seven and eighteen one-hundredths (387.18) feet, (11) North fourteen degrees twenty minutes zero seconds West (N. 14° 20′ 00″ W.) five hundred thirty and no one-hundredths (530.00) feet, (12) North sixteen degrees forty minutes zero seconds West

(N. 16° 40′ 00″ W.) two hundred sixty and no one-hundredths (260.00) feet, (13) North twenty-eight degrees thirty-five minutes zero seconds West (N. 28° 35′ 00″ W.) one hundred ninety-five and no one-hundredths (195.00) feet, (14) North eighteen degrees thirty minutes zero seconds West (N. 18° 30′ 00″ W.) one hundred seventy and no one-hundredths (170.00) feet, (15) North eighteen degrees thirty minutes zero seconds West (N. 18° 30′ 00″ W.) one hundred seventy and no one-hundredths (170.00) feet, (16) North twenty-six degrees fifty-seven minutes twenty-six seconds West (N. 26° 57′ 26″ W.) two hundred thirty-nine and forty-one one-hundredths (239.41) feet, (17) North twenty-three degrees fourteen minutes seven seconds West (N. 23° 14′ 07″ W.) sixty-five and eighty-three one-hundredths (65.83) feet, (18) North thirty-one degrees fifty-six minutes five seconds West (N. 31° 56′ 05″ W.) eighty-five and fifty-two one-hundredths (85.52) feet, (19) North thirty-three degrees thirty-seven minutes seven seconds West (N. 33° 37′ 07″ W.) eighty-four and fifty-three one-hundredths (84.53) feet, and (20) North thirty degrees four minutes twenty-six seconds West (N. 30° 04′ 26″ W.) ninety-seven and thirty-one one-hundredths (97.31) feet; thence, along riparian land, North eighteen degrees thirty-six minutes twenty-five seconds West (N. 18° 36′ 25″ W.) one hundred ninety-one and eight one-hundredths (191.08) feet to the above-mentioned easterly shoreline of Lake Erie; thence, continuing along said easterly shoreline of Lake Erie, the following seven (7) courses and distances: (1) North zero degrees nineteen minutes fifty seconds West (N. 00° 19′ 50″ W.) twenty-four and thirty-five one-hundredths (24.35) feet, (2) North six degrees twenty-six minutes thirty-five seconds West (N. 06° 26′ 35″ W.) eighty-one and forty-five one-hundredths (81.45) feet, (3) North eleven degrees forty-four minutes twenty-eight seconds West (N. 11° 44′ 28″ W.) four hundred sixty-three and fifty-eight one-hundredths (463.58) feet, (4) North two degrees fifty-five minutes zero seconds West (N. 02° 55′ 00″ W.) one hundred seventy and no one-hundredths (170.00) feet, (5) North six degrees forty-five minutes zero seconds West (N. 06° 45′ 00″ W.) two hundred forty and no one-hundredths (240.00) feet, (6) North zero degrees ten minutes zero seconds East (N. 00° 10′ 00″ E.) four hundred sixty-five and no one-hundredths (465.00) feet, and (7) North two degrees zero minutes thirty-eight seconds West (N. 02° 00′ 38″ W.) three hundred seventy-eight and fifty-four one-hundredths (378.54) feet to the southerly line of lands reputedly owned by The People of the State of New York; thence, along said last-mentioned lands, North seventy-one degrees twenty-three minutes thirty-five seconds East (N. 71° 23′ 35″ E.) one hundred fifty-four and ninety-three one-hundredths (154.93) feet to the shoreline of water formerly part of Lake Erie; thence, along said last-mentioned shoreline, the following six (6) courses and distances: (1) South eighty degrees fourteen minutes sixteen seconds East (S. 80° 14′ 16″ E.)

one hundred nineteen and thirty one-hundredths (119.30) feet, (2) North forty-six degrees fifteen minutes thirteen seconds East (N. 46° 15′ 13″ E.) forty-seven and eighty-three one-hundredths (47.83) feet, (3) North fifty-nine degrees fifty-three minutes two seconds East (N. 59° 53° 02″ E.) fifty-three and thirty-two one-hundredths (53.32) feet, (4) North thirty-eight degrees twenty minutes forty-three seconds East (N. 38° 20° 43″ E.) twenty-seven and thirty-one one-hundredths (27.31) feet, (5) North sixty-eight degrees twelve minutes forty-six seconds East (N. 68° 12′ 46″ E.) forty-eight and sixty-seven one-hundredths (48.67) feet, and (6) North twenty-six degrees eleven minutes forty-seven seconds East (N. 26° 11′ 47″ E.) eleven and forty-eight one-hundredths (11.48) feet to the first above-mentioned southerly line of lands reputedly owned by The People of the State of New York; thence, along said last-mentioned lands, North seventy-one degrees twenty-three minutes thirty-five seconds East (N. 71° 23′ 35″ E.) one thousand seventeen and nineteen one-hundredths (1017.19) feet to said TRUE POINT OF BEGINNING; CONTAINING four hundred seventy-four and five hundred forty-one one-thousandths (474.541) acres, more or less.