Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works
Sandusky, Ohio

Submitted To:

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List of Acronyms

AR/COC	Analysis Request/Chain of Custody
ASTM	American Society for Testing and Materials
bgs	below ground surface
BNA	base/neutral and acid extractables
BTEX	benzene, toluene, ethyl benzene, and xylene
CLP	Contract Laboratory Program
D&M	Dames & Moore, Inc.
DERP	Defense Environmental Restoration Program
DQE	data quality evaluation
DNB	dinitrobenzene
DNT	dinitrotoluene
DOD	U.S. Department of Defense
EPA	U.S. Environmental Protection Agency
GSA	General Services Administration
GWI	groundwater investigation
H_2S	hydrogen sulfide
HRS	Hazard Ranking System
HSA	hollow-stem auger
IDW	investigation-derived waste
IT	IT Corporation
LeRC	Lewis Research Center
µg/L	micrograms per liter
MCL	maximum contamination level
MK	Morrison and Knudsen Corporation
msl	mean sea level
NASA	National Aeronautics and Space Administration
OEPA	Ohio Environmental Protection Agency
PBOW	Plum Brook Ordnance Works
PBS	Plum Brook Station
PCB	polychlorinated biphenyl
PPE	personnel protective equipment
QAPP	quality assurance project plan
QC	quality control

RBC	risk-based concentration
RDX	royal demolition explosive
SAIC	Science Applications International Corporation
SAP	sampling and analysis plan
SOW	statement of work
SVOC	semivolatile organic compounds
TNB	trinitrobenzene
TNT	trinitrotoluene
TNTA	TNT Area A
TNTB	TNT Area B
TNTC	TNT Area C
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
VOC	volatile organic compound
WARWP	West Area Red Water Pond

Executive Summary

IT Corporation (IT) conducted a sitewide groundwater investigation (GWI) at the former Plum Brook Ordnance Works (PBOW) from September through October 1996 under contract to the U.S. Army Corps of Engineers (USACE) Nashville District. The PBOW is an approximately 9,000-acre site near Sandusky, Ohio and was used during World War II for manufacturing explosives. The site is currently owned and operated by the National Aeronautics and Space Administration (NASA) as a science research facility.

This work was conducted under the Defense Environmental Restoration Program (DERP) Formerly Used Defense Sites (FUDS) and included installation of overburden monitoring wells, redevelopment of existing monitoring wells, collection of groundwater samples, laboratory analysis of groundwater samples, evaluation of analytical and field data, and preparation and submittal of reports. The objectives of the sitewide GWI at PBOW were to acquire supplementary data of the sitewide groundwater levels and contaminants to add to an existing database, and to fill in existing data gaps in groundwater levels and contamination in western portion of PBOW. This report presents summaries of field activities, findings, conclusions, and recommendations derived from the data acquired during this sitewide GWI.

Sitewide Hydrogeology. Two major water-bearing zones exist at PBOW. The overburden water-bearing zone consists of glacial till and lacustrine deposits with varying thickness. The bedrock water-bearing zone is mainly developed in a limestone/dolomite formation containing some evaporite. General groundwater flow direction in both water-bearing zones is to the north and northeast. However, the local flow regime in the overburden may be different depending on soil thickness, topography, and surface water features and exhibits strong seasonal dependence. Some overburden wells may become dry at certain times of the year. The groundwater flow regime in the bedrock water bearing zone is believed to be influenced by the orientation and connectivity of solutionally enlarged fractures. The difference in water level elevations in both water-bearing zones indicates a predominant downward flow, but water in the shallow depth can also move upward and be lost to evapotranspiration. Data gaps were identified with respect to groundwater quality and water level elevations, especially in the middle and eastern portion of the facility.

West Area Red Water Ponds. The overburden water-bearing zone exhibits impacts by nitroaromatic compounds in the central portion of the West Area Red Water Ponds (WARWP)

area, while inorganic compounds are present at concentrations exceeding the RBCs throughout this area. Detected metals in groundwater in the WARWP area will require further evaluation to determine whether these are due to site contamination.

The bedrock water-bearing zone has been impacted by nitroaromatic and organic compounds north of the WARWP area, but does not exhibit impacts by any constituents in the central portion of the WARWP area. Inorganic compounds have also exceeded the RBCs north of the WARWP area, but these exceedances will require further evaluation to determine their source.

Pentolite Road Red Water Pond. The overburden water-bearing zone in the Pentolite Road Red Water Pond area has been impacted by nitroaromatic compounds, while the bedrock water-bearing zone exhibits impacts by benzene, toluene, ethyl benzene, and xylene (BTEX), semi-volatile organic compounds (SVOC), and nitroaromatic compounds. This area has been considered as a source area of nitroaromatic contamination because of its past land use. Although the Pentolite Road Red Water Pond area water-bearing zones exhibit larger suites of inorganic compounds at concentrations exceeding the RBCs than other areas of PBOW, further evaluation is necessary to determine whether they are attributable to site contamination.

TNT Area A. Groundwater sampling results indicate that the overburden water-bearing zone has been impacted by nitroaromatic contaminants in the vicinity of MK-MW22 in the western part of TNT Area A (TNTA). The bedrock water-bearing zone exhibits impacts by BTEX and nitroaromatic compounds in the northeastern part of TNTA. Further evaluation is, however, necessary to determine whether detected inorganic in the two water-bearing zones are attributable to site contamination

TNT Area B. The overburden water-bearing zone has been impacted by nitroaromatic compounds downgradient of TNT Area B (TNTB). Further evaluation is necessary to determine whether detected inorganic compounds are attributable to site contamination or natural conditions. The bedrock water-bearing zone within this area has not been investigated.

TNT Area C. The overburden water-bearing zone in TNT Area C (TNTC) has not been impacted by organic compounds, nitroaromatic compounds, or pesticides and polychlorinated biphenyls (PCB). A small number of metals were detected and exceeded the risk-based concentration (RBC) in the dissolved phase, but further evaluation is needed to determine whether these detections are attributable to site contamination. The bedrock water-bearing zone

has been impacted by nitroaromatic and organic compounds in TNTC. Inorganic compounds have also exceeded the RBC in TNTC area, but these exceedances will require further evaluation to determine their source.

Sitewide Groundwater Quality. Analysis of groundwater samples collected from wells across the PBOW has shown that the overburden water-bearing zone has been impacted by nitroaromatic compounds with the exception of TNTC. Nitroaromatic compounds were also detected in six of the eight bedrock wells sampled, indicating that nitroaromatic contamination is evident in both water-bearing zones. Organic compounds (volatile organic compounds [VOC] and SVOCs) at concentrations exceeding the RBCs were present exclusively in overburden water-bearing zones in the two red water pond areas. At least one BTEX compound was detected in all bedrock wells, except BED-MW14 and -MW20. Free product was found in BED-MW16 located near the central toluene tank area. A variety of metals were present in groundwater samples from both water-bearing zones and some of them exceeded the RBCs. However, it is not clear whether these elevated metals are attributable to site contamination or are naturally occurring constituents. Hydrogen sulfide (H_2S) gas was encountered in three bedrock wells indicating a possible reducing environment in the bedrock zone. Pesticides and PCBs were not detected in any wells sampled during this investigation. Groundwater samples collected from five overburden wells and one bedrock well contained cyanide. However, the presence of cyanide in water samples is attributable to suspended solids since cyanide was not detected in filtered samples.

Overall groundwater quality in both water-bearing zones at PBOW showed evidence of impacts from past use of the site, including manufacturing explosives by the former PBOW in the 1940s and post-PBOW operations by NASA. Based on the GWI conducted at PBOW, additional sampling efforts are recommended. These efforts include additional well installation, quarterly water level measurements, seasonal groundwater sampling, and delineation of the lateral extent of contamination in the two red water pond areas as well as geochemical study of bedrock water quality to determine the source of H_2S.

1.0 Introduction

The U.S. Army is conducting studies of the environmental impact of suspected hazardous waste sites at properties previously owned by the U.S. Department of Defense (DOD). This work is being pursued by the U.S. Army Corps of Engineers (USACE) under the Defense Environmental Restoration Program (DERP). The former Plum Brook Ordnance Works (PBOW) in Sandusky, Erie County, Ohio is a DERP FUDS project currently being managed and technically overseen by the Nashville District of USACE. Figure 1-1 shows the geographic location of the former PBOW site. IT Corporation (IT) performed a sitewide groundwater investigation (GWI) at PBOW from September to October 1996. This work was performed under Delivery Order 0016 of Contract Number DACA62-94-D-0030.

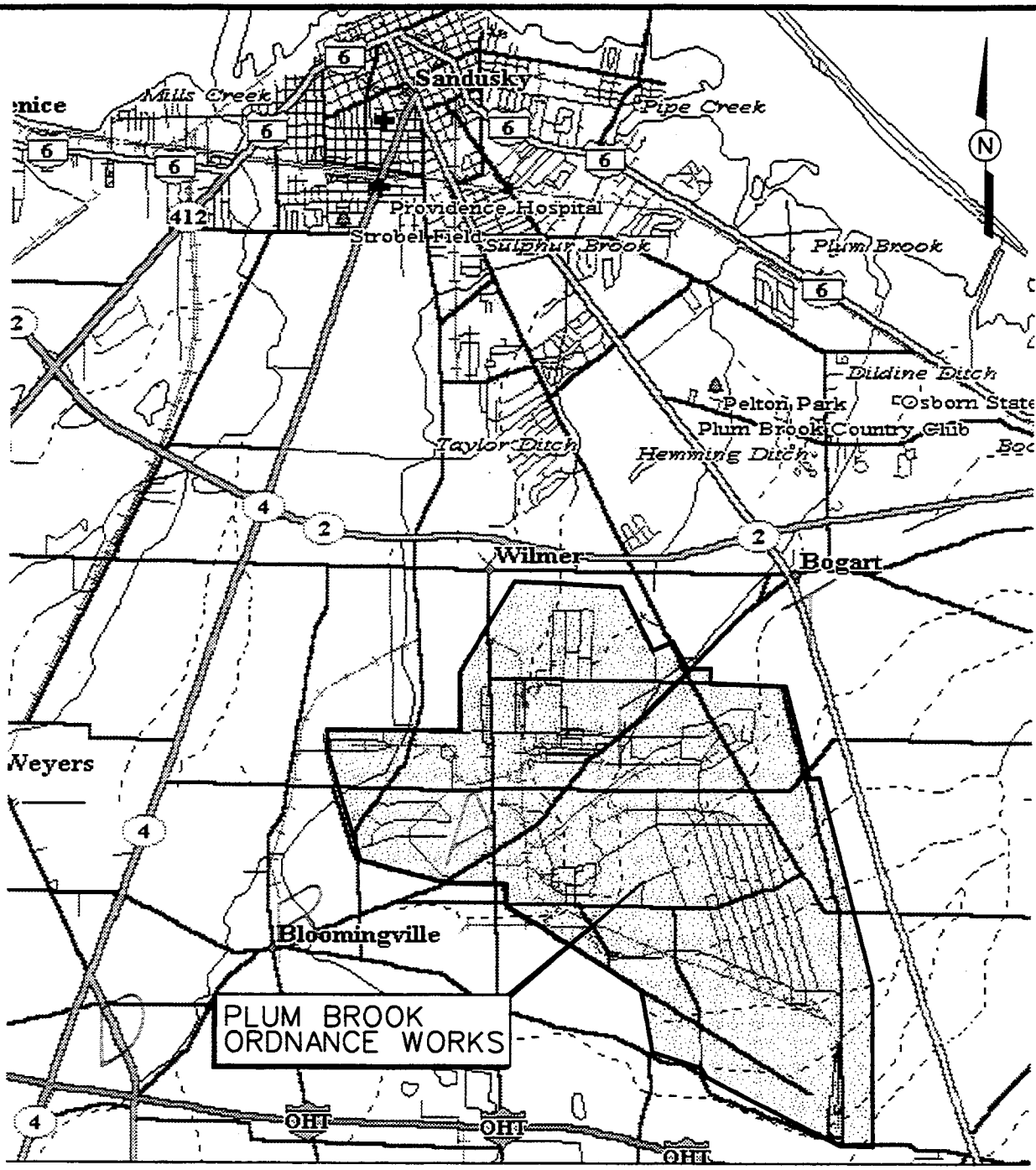
1.1 Scope of Work and Project Objectives

The scope of this GWI as specified in the statement of work (SOW) (USACE, 1995) includes a site inspection, preparation and completion of site specific work plans, completion of various field investigation activities, evaluation of analytical results from samples collected during the field investigation, preparation and submittal of reports characterizing activities, conclusions, and recommendations for further actions. Based on the findings of previous investigations, this GWI acquired supplemental data on the hydrogeologic characteristics and groundwater contamination at the PBOW site, with particular focus being placed in the western portion of the site including the West Area Red Water Ponds (WARWP) and Trinitrotoluene (TNT) Area C (TNTC). Figure 1-2 identifies the areas of concern at the PBOW site.

Activities completed during the field investigation included conducting a site visit, drilling, installing 3 new monitoring wells and 1 piezometer, redeveloping 28 existing monitoring wells, collecting groundwater samples from 28 existing and 3 newly installed wells, conducting a land survey, and handling investigation-derived waste (IDW). Groundwater samples collected for chemical analysis included primary samples and field quality control (QC) samples.

The purpose of this GWI was to collect supplemental information on groundwater levels and contaminants at PBOW and to fill in data gaps identified in the western portion of the site. Specifically, the objectives of the GWI at PBOW were to:

- Define or confirm local groundwater flow conditions in both residual and bedrock aquifers in areas of concern including WARWP and TNTC.



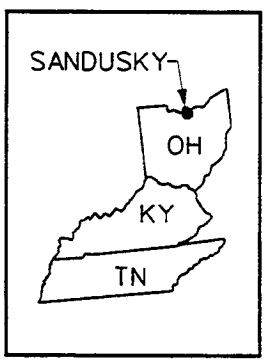


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FIGURE 1-1
VICINITY MAP

PLUM BROOK ORDNANCE WORKS
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 6-11-96	DATE LAST REV.:	DRAFT. CHCK. BY: CET	INITIATOR: G. YU	DWG. NO.: 766952ES.005
DRAWN BY: R. KNIGHT	DRAWN BY:	ENGR. CHCK. BY: G. YU	PROJ. MGR.: D. BURTON	PROJ. NO.: 766952

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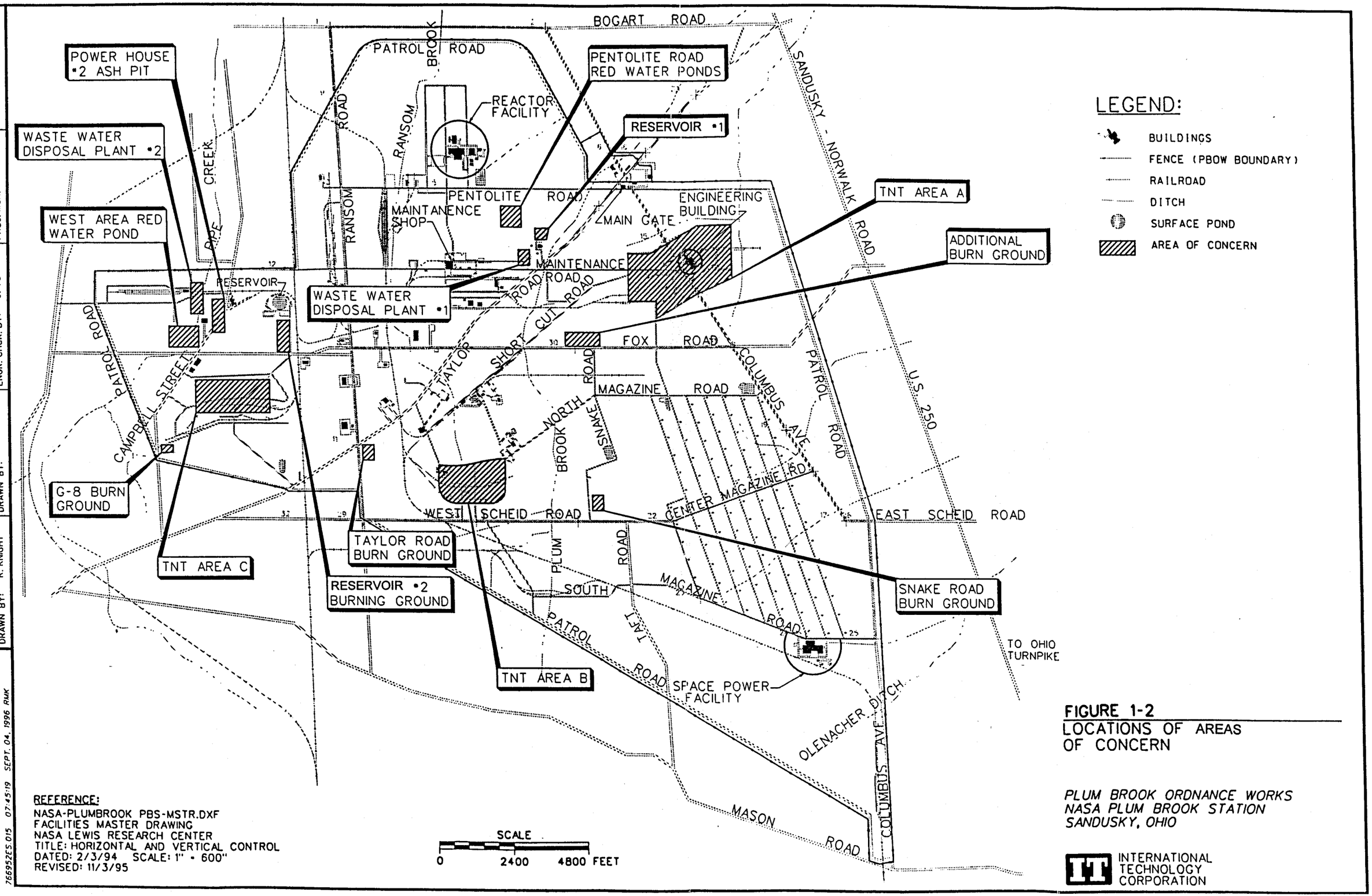

FIGURE 1-2
LOCATIONS OF AREAS OF CONCERN

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

DRAFT. CHCK. BY: R. KNIGHT	INITIATOR: G. YU	DWG. NO.:	ES:015
ENGR. CHCK. BY: G. YU	PROJ. MGR.: D. BURTON	PROJ. NO.: 766952	
STARTING DATE: 09/04/96	DATE LAST		
DRAWN BY: R. KNIGHT	DRAWN BY:		

766952ES.015 07:45:19 SEPT. 04, 1996 RMK

- Further delineate the extent and magnitude of groundwater contamination in residual and bedrock water-bearing zones in the vicinity of the WARWP and TNTC.

- Document any changes in groundwater quality since last sampling event and assess if there is any notable trend of possible contaminant migration off site via groundwater.

1.2 Site History and Potential for Contamination

The 9,009-acre PBOW site was built in early 1941 as a manufacturing plant for 2,4,6-TNT, dinitrotoluene (DNT), and pentolite. Production of explosives began on December 16, 1941 and continued until 1945. It is estimated that more than 1 billion pounds of explosives were manufactured during the 4-year operating period.

After the plant was shut down, decontamination of TNT, acid, pentolite, and DNT processing lines began and was completed during the last quarter of 1945. The property was initially transferred to the Ordnance Department, then to the War Assets Administration after it was certified by the U.S. Army to be decontaminated. In 1949, PBOW was transferred to the General Services Administration (GSA).

The National Aeronautics and Space Administration (NASA) acquired PBOW on March 15, 1963 and is presently utilizing the site. On April 18, 1978, NASA declared approximately 2,152 acres of land as excess. The Perkins Township Board of Education acquired 46 acres of the excess and uses this area as a bus transportation center. GSA retains the remaining acreage and currently has a use agreement with the Ohio National Guard for 604 acres of the land. NASA presently controls approximately 6,400 acres and is using the site to conduct space research as a satellite operation of NASA's Lewis Research Center (LeRC) in Cleveland, Ohio. The details of these land transactions are listed in the site management plan and can be found at the NASA Plum Brook Station (PBS).

Potential contaminants in the groundwater at PBOW, based on review of historical use of the site and findings of previous investigations, may include nitroaromatic compounds (explosive residual), volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides/polychlorinated biphenyls (PCB), cyanide, and dissolved metals.

1.3 Summary of Previous Environmental Studies

Previous investigations of site hydrogeology and groundwater contamination were documented in the contamination evaluation report (IT, 1991), the site inspection report (Morrison and Knudsen Corporation [MK], 1994), and the sitewide GWI draft report (Dames & Moore, Inc. [D&M], 1995).

In 1989, IT conducted the contamination evaluation focusing on areas associated with past DOD operations at PBOW under contract for the USACE Nashville District Office. The objective of this preliminary evaluation was to confirm or deny the presence of residual chemical contamination from operational activities conducted at the site during DOD operations. As part of the investigation, four groundwater monitoring wells were installed in the residual aquifer. IT-MW01 was placed at the intersection of Scheid Road and Patrol Road to monitor the quality of groundwater entering the site. IT-MW02 and IT-MW05 were installed in the presumed downgradient locations close to Waste Disposal Areas 1 (also known as Pentolite Road Red Water Ponds) and 2 (also known as WARWP), respectively. IT-MW06 was located near the north perimeter of the site and monitors the quality of groundwater exiting the site. Groundwater samples were collected for analyses of VOCs, SVOCs, nitroaromatic compounds, nitrates, sulfates, and metals. Analytical results indicated that several VOCs and SVOCs were present at concentrations in the low parts per billion range, including acetone, carbon disulfide, 2,6-DNT, and 2,4-DNT. Concentrations of chromium, manganese, and sulfate were also detected in some groundwater samples at elevated concentrations. The contamination evaluation concluded that these detected organic and inorganic compounds in groundwater represented groundwater contamination from past activities at the facility. The Hazard Ranking System (HRS) score was calculated for the site based on the results of this evaluation. The HRS score was zero because there are no target users of impacted groundwater or surface water within 3 miles of the site.

A site inspection was conducted at PBOW by MK from June through July of 1993 under contract for NASA. The purpose of the site inspection was to collect information concerning conditions at the PBS facility sufficient to assess the threat posed to human health and the environment and to determine the need for any additional investigation. A total of 13 monitoring wells were installed in the overburden water-bearing zone by MK in multiple areas. The results of the MK investigation identified limited contamination by nitroaromatics and metals.

From May to June of 1995, D&M conducted a GWI under contract to Nashville and Huntington USACE districts. The objectives of the D&M investigation were to evaluate groundwater occurrence and flow conditions in the overburden and bedrock water-bearing zone; to assess the

groundwater quality in the overburden water-bearing zone and at the Red Water Ponds and TNT Manufacturing areas; to investigate on a sitewide basis the baseline groundwater quality of the bedrock water-bearing zone, and to evaluate the necessity of additional work at PBOW. A total of 11 monitoring wells were installed in the overburden water-bearing zone and 8 wells were placed in the limestone bedrock. The general groundwater flow directions in both water-bearing zones as indicated on the contour maps are to the north, eventually toward Lake Erie. However, the investigation also found that the groundwater flow in the overburden exhibited a strong vertical component in most of the site and the presence of groundwater in the overburden water-bearing zone was seasonally dependent. Groundwater samples were collected from 25 wells and analyzed for nitroaromatics, nitrates, and metals. Samples from bedrock wells were also analyzed for VOCs and base/neutral and acid extractables (BNA). The analytical results indicate that significant levels of explosive residues (including 1,3,5-trinitrobenzene [TNB], 1,3-dinitrobenzene [DNB], and 2,4-DNT) are present in the groundwater in the overburden water-bearing zone in the vicinity of both Red Water Pond areas. However, away from the ponds, the levels of detected explosives in groundwater decrease. Low levels of explosives were also reported in some overburden wells placed in TNT Area A (TNTA), TNT Area B (TNTB), and in several bedrock wells at both Red Water Ponds and in TNTC. Several VOCs and BNAs were detected in bedrock aquifer including hydrocarbons compounds with benzene concentrations in seven of the nine bedrock wells at or above the regulatory action level. In addition, 11 metals were detected in groundwater samples in a few limited areas, with concentrations of copper, manganese, nickel, and thallium occasionally exceeding their respective regulatory action levels.

1.4 Summary of Existing Site Conditions

The former PBOW site is currently owned by the NASA and is operated as the PBS of the NASA LeRC in Cleveland, Ohio. Most of the aerospace testing facilities built in the 1960s at the site are in standby or inactive status. The site is located approximately 4 miles south of Sandusky, Ohio and is specifically located in the Perkins, Oxford, Huron, and Milan Townships. The site is bounded on the north by Bogart Road, on the south by Mason Road, on the west by County Road 43, and on the east by U.S. Highway 250. The areas surrounding PBOW is mostly agricultural and residential.

The topography of PBOW site is characterized by a fairly flat ground surface that slopes gradually northward toward Lake Erie at an average gradient of less than two percent. Elevations at the site range from 675 feet above mean sea level (msl) at the southeast edge of the site to about 625 feet msl in the northern portion of the installation at Bogart Road. Eleven streams exist within the site and flow toward Lake Erie. Plum Brook, Ransom Brook, and Pipe Creek are

the three major streams and are being monitored by NASA PBS. The climate in north-central Ohio is typical continental and shows significant influence by Lake Erie. Mean annual precipitation is 33.90 inches and the average monthly precipitation is approximately 1.65 inches for February and 3.70 inches for the month of July.

Bedrock geology at PBOW is characterized by Devonian and Silurian carbonate and clastic rocks, generally dipping to the southeast. The thickness of glacial till or lacustrine deposit cover ranges from approximately 5 feet or less for most of the site to approximately 20 feet in the northern boarder of the site. In many locations, bedrocks are exposed on the ground surface. According to the PBOW preliminary assessment (Science Applications International Corporation [SAIC], 1991) some karst features are present in the carbonate rocks forming a water-bearing formation underneath the soil cover.

Public access is restricted at PBOW except during the annual deer hunting season.

2.0 Field Activities

Field activities were conducted by IT personnel from September 23 to October 5, and continued from October 13 through October 24 1996. Mr. Keith Peecook, the environmental coordinator of NASA PBS, acted as the project contact and approved drilling/digging permit and extended work hours during the course of the project. Mr. Ron Nabors of Ohio Environmental Protection Agency (OEPA) visited the site on October 24, 1996.

2.1 Monitoring Well Installation

Three monitoring wells were installed in the overburden water-bearing zone as part of this investigation. In addition, one piezometer was also installed in place of the planned monitoring well IT-MW07. Monitoring well IT-MW08 was installed to a depth of 15 feet below ground surface (bgs) approximately 50 feet north of the old pump house near Power House No.2. IT-MW09 was located south of an abandoned barn across a path that intersects Campbell Street to the west. IT-MW10 (renamed from IT-MW06 specified in the sampling and analysis plan [SAP] to avoid duplication of previous well identifications) was placed northwest of the WARWP, approximately 20 feet south of a west-east oriented road that intersects Patrol Road to the west. IT-MW07 was originally planned southwest of the WARWP approximately 200 feet northwest of existing well WA-MW2. However, access to the intended drilling location was impossible due to site conditions, and a temporary piezometer was installed to a depth of 5 feet using a portable earth-digging device at the same location to allow for collection of water samples. All new and existing monitoring wells that were sampled during this GWI are shown in Figure 2-1.

Monitoring wells were installed in accordance with guidelines specified in EM-1110-1-4000 (USACE, 1994) and following procedures established in the sitewide SAP (IT, 1996a). Specifically, monitoring wells were installed as follows.

A Dietrich D-50 truck-mounted rotary drill rig was used to drill boreholes in the overburden soil for well installation. The boring was advanced using 8.25-inch outside diameter (4.25-inch inside diameter) hollow-stem auger (HSA) to the depth of auger refusal. Soil core samples were collected continuously from the ground surface to the terminating depth using a 2-foot-long and 2-inch-diameter stainless-steel split spoon. Soil samples were visually examined by the IT field geologist for lithologic description and boring logs were completed on site to document soil profiles. Three discrete soil samples were collected from each borehole for geotechnical testing. At least one of the three geotechnical samples was collected from the screened interval to allow

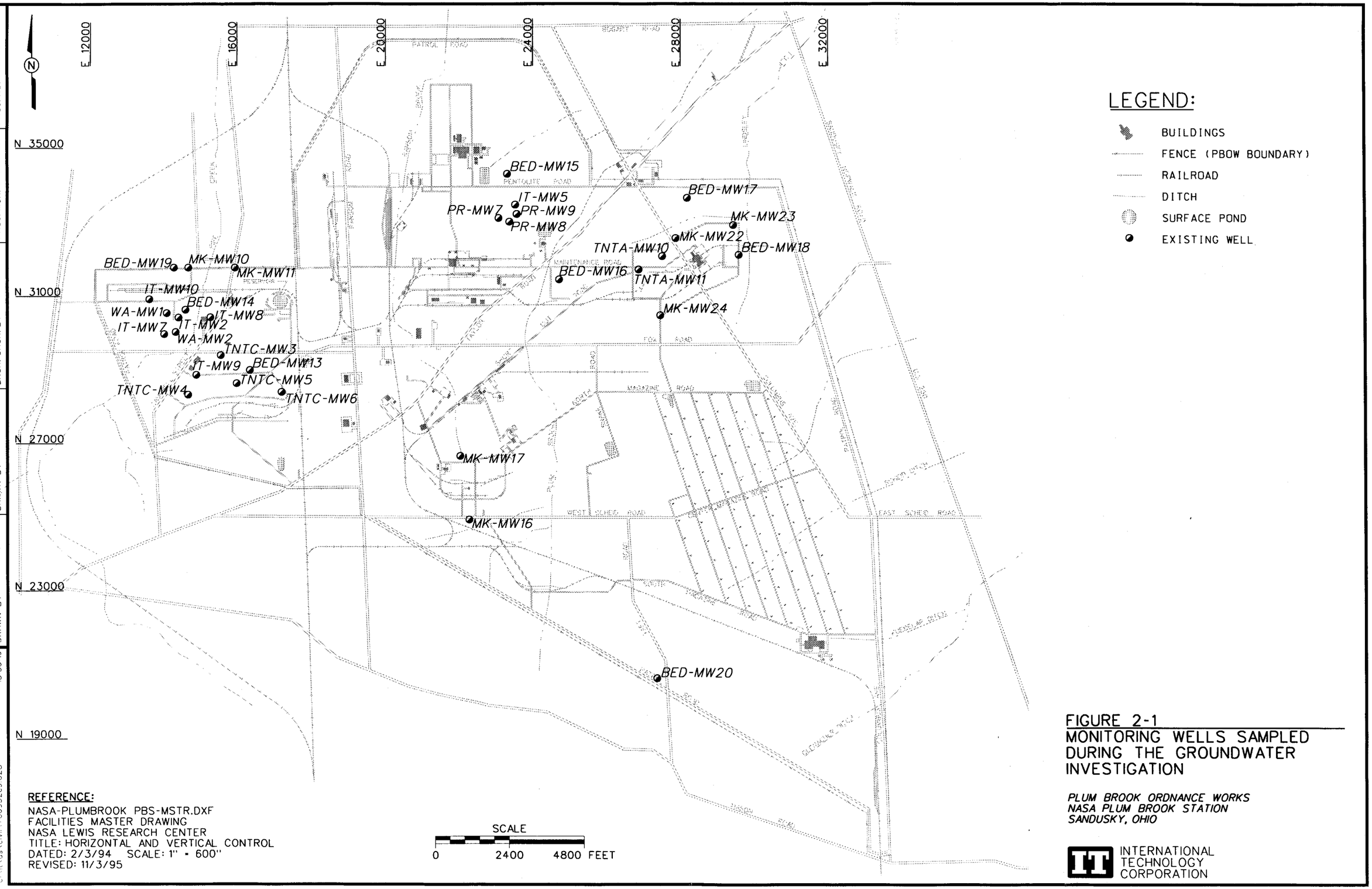

FIGURE 2-1
MONITORING WELLS SAMPLED DURING THE GROUNDWATER INVESTIGATION

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: R. KNIGHT | INITIATOR: G. YU | DWG. NO.: ...52es.028
ENGR. CHCK. BY: G. YU | PROJ. MGR.: D. BURTON | PROJ. NO.: 766952
STARTING DATE: 3/11/97 | DATE LAST
DRAWN BY: R. KNIGHT | DRAWN BY:
23 SEP 97 15:33:19
rvanderg
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for selection of proper size of filter materials. Geotechnical testing results are included in Appendix A. Soil samples were also scanned using an HNu for the presence of VOCs. The terminating depths for the three well boreholes were all at top of bedrock: MW10 at 20 feet bgs, MW08 at 15 ft bgs, and MW09 at 13.8 ft bgs, respectively.

New monitoring well construction details are summarized in Table 2-1. Drilling logs and monitoring well construction diagrams are included in Appendix A of this report.

2.2 Monitoring Well Development and Purging

Well development of the new wells was performed by surging followed by either bailing or pumping. Two wells (IT-MW09 and IT-MW10) exhibited extremely low well yield and were bailed dry before the well development criteria as set forth in the SAP (IT, 1996a) were met. The recovery rates in both wells were too low to allow for the completion of well development within a reasonable time frame. These two wells are considered not fully developed and will need additional surging/purging prior to any sampling effort in the future. It is believed that the extremely low recharge rate of these wells reflects seasonal conditions. Monitoring well IT-MW08 was developed by surging and pumping. A total of 68 gallons of water were removed and placed in 55-gallon sealable drums for later disposal. Upon completion of well development, a water sample was collected from IT-MW08 and photographed. A well development log was completed for each well by the IT field geologist to document well development procedures, field parameters, and other pertinent information. Photographs of development water and well development logs are included in Appendix B.

In addition to developing new monitoring wells, a total of 28 existing wells and 3 new wells were purged prior to collection of representative groundwater samples for chemical analysis, following procedures specified in the SAP (IT, 1996a). Purging was performed to remove stagnant water column inside the well casing and in the filter pack to allow collection of representative water samples. Purging was performed using a bailer or a submersible pump. During purging, field measurements of pH , Eh, temperature, dissolved oxygen, turbidity, and conductivity were collected to monitor changes in water quality as purging processed.

All existing monitoring wells that were included in the GWI are listed in Table 2-2.

2.3 Groundwater Sampling

Groundwater samples were collected for chemical analysis after well development or purging. The procedures specified in the SAP (IT, 1996a) were followed during groundwater sampling.

Table 2-1

New Monitoring Well Construction Details
Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Well Identification	Well Depth (feet)	Date Installed	Casing Type	Casing Diameter (inch)	Borehole Diameter (inch)	Screen Interval (feet, bgs)	Top of Filter Pack (feet, bgs)	TOC Elevation[a] (feet, msl)	Ground Elevation[a] (feet, msl)
IT-MW007	5.5	10/1/96	PVC (40)	2	4.25	0.5 - 5.5	--	635.03	632.3
IT-MW008	13.4	9/27/96	PVC (40)	2	8.25	3.1 - 13.1	3.6	633.16	630.6
IT-MW009	14.5	9/26/96	PVC (40)	2	8.25	4.1 - 14.1	2.0	647.45	645.4
IT-MW010[b]	19.8	9/26/96	PVC (40)	2	8.25	9.3 - 19.3	8.6	644.80	642.2

[a] Reference to 1988 North America Vertical Datum (NAVD)
[b] Renamed from IT-MW06

Table 2-2

Existing Monitoring Well Construction Details
Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Well Identification	Well Depth (feet)	Date Installed	Installed By	Casing Type	Casing Diameter (inch)	Borehole Diameter (inch)	Screen Interval (feet, bgs)	Top of Filter Pack (feet, bgs)	TOC Elevation (feet, msl)	Ground Elevation (feet, msl)	Well Location
PB-TNTA-MW10	11.0	1994	D& M[a]	PVC (40)	2"	8"	3-11	2.5	640.17	637.5	Northwest side of TNT Area A
PB-TNTA-MW11	11.4	1994	D& M[a]	PVC (40)	2"	8"	3.4-11.4	2.5	640.49	637.86	West side of TNT Area A
PB-TNTC-MW3	14.0	1994	D& M[a]	PVC (40)	2"	8"	5-14	3.2	645.41	642.56	North of TNT Area C
PB-TNTC-MW4	18.8	1994	D& M[a]	PVC (40)	2"	8"	8.8-18.8	6.0	654.42	651.89	West side of TNT Area C
PB-TNTC-MW5	29.7	1994	D& M[a]	PVC (40)	2"	8"	4.7-29.7	3.7	651.81	649.07	North side of TNT Area C
PB-TNTC-MW6	12.2	1994	D& M[a]	PVC (40)	2"	8"	3.2-12.2	2.5	659.40	65682	Northeast of TNT Area C
PB-WA-MW1	22.3	1994	D& M[a]	PVC (40)	2"	8"	4.3-22.3	3.7	644.43	642.32	North of West area red water pond
PB-WA-MW2	12.0	1994	D& M[a]	PVC (40)	2"	8"	3-12	2.5	633.65	631.15	Southeast side of West area red water pond
PB-PR-MW7	22.3	1994	D& M[a]	PVC (40)	2"	8"	4.3-22.3	3.0	633.98	631.5	West side of Pentolite Road Red Water ponds
PB-PR-MW8	27.5	1994	D& M[a]	PVC (40)	2"	8"	5-27.5	4.0	635.02	632.5	South side of Pentolite Road Red Water Ponds
PB-PR-MW9	19.0	1994	D& M[a]	PVC (40)	2"	8"	4-19	3.0	633.69	630.7	East side of Pentolite Road Red Water Ponds
PB-BED-MW13	75.5	1994	D& M[a]	PVC (40)	4" to 46	10" to 46	(3") 46-75.5[b]	---	648.27	645.81	North of TNT Area C
PB-BED-MW14	52.2	1994	D& M[a]	PVC (40)	4" to 29	10" to 29	(3") 29-52.2[b]	---	646.04	643.05	East of West Area Red Water Pond, west of Campbell Street
PB-BED-MW15	74.4	1994	D& M[a]	PVC (40)	4" to 31.5	10" to 31.5	(3") 31.5-74.4[b]	---	631.64	629.08	North of Pentolite Road, East of Reactor Facility
PB-BED-MW16	74.0	1994	D& M[a]	PVC (40)	4" to 49.2	10" to 49.2	(3") 49.2-74[b]	---	636.02	633.68	South of Pentolite Road Red Water Pond, west of TNT Area A
PB-BED-MW17	64.4	1994	D& M[a]	PVC (40)	4" to 45	10" to 45	(3") 45-64.4[b]	---	629.97	627.34	Northeast of TNT Area A
PB-BED-MW18	75.4	1994	D& M[a]	PVC (40)	4" to 51	10" to 51	(3") 51-75.4[b]	---	651.50	648.83	East of TNT Area A
PB-BED-MW19	49.5	1994	D& M[a]	PVC (40)	4" to 32	10" to 32	(3") 32-49.5[b]	---	643.07	640.5	On north side of Patrol Road along the northern property boundary
PB-BED-MW20	49.5	1994	D& M[a]	PVC (40)	4" to 35	10" to 35	(3") 35-49.5[b]	---	676.33	673.57	Near intersection of Patrol Rd and TAFT Rd, west of a fence area
MK-MW10	14.0	1993	MK[c]	PVC (40)	2"	8"	4-14	2.0	641.25	638.23	Along Maintenance Rd, north of West Area Red Water Pond
MK-MW11	13.0	1993	MK[c]	PVC (40)	2"	8"	3-13	2.0	638.00	634.88	Along Maintenance Rd, north of West Area Red Water Pond
MK-MW16	8.0	1993	MK[c]	PVC (40)	2"	8"	3-8	2.0	674.64	671.45	Along West Scheid Rd directly behind TNT Area B
MK-MW17	6.0	1993	MK[c]	PVC (40)	2"	8"	2-6	1.0	661.90	661.43	Along north side of North Magazine Rd in front of TNT Area B
MK-MW22	9.5	1993	MK[c]	PVC (40)	2"	8"	4.5-9.5	3.5	638.95	635.84	North side of 7141 along Columbus Ave.
MK-MW23	16.0	1993	MK[c]	PVC (40)	2"	8"	6-16	4.0	640.01	637.01	Loop Rd behind 7141
MK-MW24	9.5	1993	MK[c]	PVC (40)	2"	8"	4.5-9.5	2.5	657.59	654.59	SW corner of PMU
IT-MW002	18.3	1989	IT Corp	PVC (40)	2"	8"	6-16	4.0	636.69	639.59	West area red water pond
IT-MW005	21.0	1989	IT Corp	PVC (40)	2"	8"	8.5-18.5	6.5	634.99	631.91	north of Pentolite Road Red Water Pond

[a]Dames & Moore
[b]Open hole interval in bedrock, no screen installed
[c]Morrison and Knudsen Corporation

Prior to groundwater sample collection, the volume of water in the well was calculated based on water level measurements and well construction information, assuming a 30 percent porosity in the filter pack material. During purging, 3 to 5 volumes of water contained in the well were removed or the well was bailed dry before the required volume was reached. After purging, groundwater samples were collected in the general order of VOCs, SVOCs, nitroaromatic explosives, metals, cyanide, and pesticides and PCBs using a disposable bailer fitted with a bottom-emptying device. Sampling bailers were discarded after each use to avoid cross contamination. Field parameters (pH, oxidation-reduction potential, temperature, dissolved oxygen, turbidity, and conductivity) were collected at the time of sampling. Tables 2-3 and 2-4 summarize field parameters measured during groundwater sampling and groundwater sample information, respectively.

2.4 Groundwater Level Measurement

Static groundwater levels were measured prior to purging the well for sample collection. Water level measurements were taken with a decontaminated water level indicator, and measured to the nearest 0.01 foot from the top of the polyvinyl chloride well riser at the surveyed notch. Table 2-5 presents the water level data obtained during September and October 1996 investigation. Water levels measured at the same well in December 1994 and March 1995 by D&M are also included for comparison. Based on the monitoring well water level data, groundwater level elevation contour maps were constructed for overburden and bedrock wells. The interpretations of these contour maps with respect to groundwater flow conditions are presented in Section 5.1.

2.5 Investigation-Derived Wastes

IDW generated during the GWI includes well development water, purge water, drill cuttings, decontamination water, and disposable personnel protective equipment (PPE). IDW was managed and handled in accordance with procedures described in the SAP (IT, 1996a).

Soil cuttings from each well borehole were placed in 55-gallon drums with drum liners. Well development and purge waters were also containerized in drums. Decontamination water was collected in drums prior to removal of the decontamination pad. All drums were labeled with the contained materials, content volume, date of generation, and source of origin as applicable. IDW drums were temporarily left at their point of origin before being disposed of in the designated IDW disposal area. Personal protective equipment was doubled-bagged and placed in the on-site industrial dumpster; remaining IDW was disposed of in the area located south of Pentolite Road, known as the Pentolite Road Red Water Ponds. Previous investigations (IT, 1991; MK, 1994; and D&M, 1996) have identified and confirmed soil and groundwater contamination by

Table 2-3

Field Measurements of Groundwater Parameters
Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Well Identification	Date	Conductivity (µmhos/cm)	pH	Eh (mV)	Temperature (deg. C)	Turbidity (NTU)	Dissolved O_2 (ppm)	HNu (ppm)
Overburden Wells								
IT-MW08	10/17/96	1.78	6.54	-45	13.0	8	0.78	0
MK-MW24	10/22/96	2.44	6.75	20	16.4	49	3.97	0
MK-MW23	10/23/96	N/A[a]	N/A	N/A	N/A	N/A	N/A	N/A
MK-MW17	10/21/96	0.857	5.71	75	14.2	247	0.82	0
PB-TNTA-MW11	10/22/96	1.59	6.32	-35	14.1	33	1.71	0
PB-TNTA-MW10	10/22/96	1.41	6.89	N/A	14.2	37	1.47	0
MK-MW22	10/22/96	0.589	6.88	45	15.8	584	4.21	0
PB-PR-MW-07	10/21/96	13.4	6.67	N/A	14.2	598	4.77	N/A
IT-MW10[b]	10/20/96	0.841	6.00	75	11.5	90	1.84	0
IT-MW09	10/18/96	Dry[c]	Dry[c]	Dry[c]	Dry[c]	Dry[c]	Dry[c]	Dry[c]
IT-MW05	10/20/96	0.665	7.33	N/A	11.5	999	0.57	0
PR-MW09	10/20/96	7.05	7.04	N/A	11.5	69	1.29	0
PB-PR-MW-08	10/20/96	35.6	6.76	N/A	11.1	675	1.18	0.2
IT-MW007	10/16/96	Dry[c]	Dry[c]	Dry[c]	Dry[c]	Dry[c]	Dry[c]	Dry[c]
MK-MW-10	9/27/96	0.543	7.14	N/A	15.7	609	4.13	N/A
MK-MW-11	9/27/96	0.814	7.00	N/A	14.7	999	5.27	N/A
DM-MW-03	9/27/96	3.42	6.80	N/A	12.8	999	N/A	N/A
PB-TNTC-MW4	9/30/96	2.27	7.26	160	14.0	999	4.42	N/A
PB-TNTC-MW5	9/30/96	1.55	7.02	120	11.5	510	5.24	N/A
PB-TNTC-MW6	10/2/96	1.21	6.95	190	16.3	469	3.98	N/A
PB-WA-MW1	9/30/96	1.05	6.91	175	11.4	N/A	2.97	N/A
PB-WA-MW2	9/30/96	4.98	6.94	190	14.5	999	0.82	N/A
IT-MW02	9/30/96	2.33	6.61	185	12.8	N/A	0.39	N/A
MK-MW16	9/30/96	1.27	5.73	175	19.9	3	2.38	N/A
Bedrock Wells								
PB-BED-MW19	10/17/96	1.91	6.71	N/A	13.8	69	1.68	N/A
PB-BED-MW18	10/22/96	32.4	6.40	N/A	13.1	214	0.44	4.3
PB-BED-MW20	10/23/96	49.4	6.79	-60	13.0	141	0.82	0
PB-BED-MW17	10/24/96	4.44	6.90	N/A	11.0	27	0.66	9.7
PB-BED-MW16	10/25/96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PB-BED-MW15	10/21/96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PB-BED-MW14	10/17/96	2.62	6.88	75	11.5	122	4.94	2.8
PB-BED-MW13	10/17/96	8.2	6.65	N/A	13.7	41	1.31	6.1

[a] Not measured due to instrument malfunction
[b] Renamed from IT-MW06
[c] Dry well

Table 2-4

Summary of Primary Groundwater Samples
Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Well Identification	Sample Identification	Sampling Date	Laboratory Reference Number
PB-TNTA-MW10	PBOW-96-GW-TNTAMW10-5050	10/22/96	5050
PB-TNTA-MW11	PBOW-96-GW-TNTAMW11-5060	10/22/96	5060
PB-TNTC-MW3	PBOW-96-GW-TNTCMW3-5070	9/27/96	5070
PB-TNTC-MW4	PBOW-96-GW-TNTCMW4-5080	9/30/96	5080
PB-TNTC-MW5	PBOW-96-GW-TNTCMW5-5090	9/30/96	5090
PB-TNTC-MW6	PBOW-96-GW-TNTCMW6-5100	10/2/96	5100
PB-WA-MW1	PBOW-96-GW-WAMW1-5110	9/30/96	5110
PB-WA-MW2	PBOW-96-GW-WAMW2-5120	9/30/96	5120
PB-PR-MW7	PBOW-96-GW-PRMW07-5130	10/20/96	5130
PB-PR-MW8	PBOW-96-GW-PRMW08-5140	10/20/96	5140
PB-PR-MW9	PBOW-96-GW-PRMW09-5150	10/20/96	5150
PB-BED-MW13	PBOW-96-GW-BEDMW13-5160	10/17/96	5160
PB-BED-MW14	PBOW-96-GW-BEDMW14-5170	10/17/96	5170
PB-BED-MW15	PBOW-96-GW-BEDMW15-5180	10/21/96	5180
PB-BED-MW16	PBOW-96-GW-BEDMW16-5190	10/25/96	5190
PB-BED-MW17	PBOW-96-GW-BEDMW17-5200	10/24/96	5200
PB-BED-MW18	PBOW-96-GW-BEDMW18-5210	10/22/96	5210
PB-BED-MW19	PBOW-96-GW-BEDMW19-5220	10/17/96	5220
PB-BED-MW20	PBOW-96-GW-BEDMW20-5230	10/23/96	5230
MK-MW10	PBOW-96-GW-MKMW10-5240	9/27/96	5240
MK-MW11	PBOW-96-GW-MKMW11-5250	9/27/96	5250
MK-MW16	PBOW-96-GW-MKMW16-5260	9/30/96	5260
MK-MW17	PBOW-96-GW-MKMW17-5270	10/21/96	5270
MK-MW22	PBOW-96-GW-MKMW22-5280	10/22/96	5280
MK-MW23	PBOW-96-GW-MKMW23-5290	10/23/96	5290
MK-MW24	PBOW-96-GW-MKMW24-5300	10/22/96	5300
IT-MW002	PBOW-96-GW-ITMW02-5310	9/30/96	5310
IT-MW005	PBOW-96-GW-ITMW05-5320	10/20/96	5320
IT-MW010 *	PBOW-96-GW-ITMW06-5010	10/20/96	5010
IT-MW007 **	DRY	–	–
IT-MW008	PBOW-96-GW-ITMW08-5030	10/17/96	5030
IT-MW009	DRY	–	–

* Renamed from IT-MW-006
** Temporary piezometer

Table 2-5

Groundwater Level Elevations
Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Well Identification	TOC Elevation (feet, msl)	Ground Elevation (feet, msl)	Water Level Elevation Dec-94 (feet, msl)	Water Level Elevation Mar-95 (feet, msl)	Water Level Elevation Oct-96 (feet, msl)	Water Level Change since Mar. 95 (feet)	Notes
PB-TNTA-MW10	640.18	637.5	633.71	637.04	635.62	-1.42	
PB-TNTA-MW11	640.50	637.86	630.56	632.82	633.56	0.74	
PB-TNTC-MW3	645.41	642.57	Dry, <628.57	639.2	635.01	-4.19	
PB-TNTC-MW4	654.43	651.89	634.87	651.07	648.51	-2.56	
PB-TNTC-MW5	651.81	649.07	628.01	647.62	643.28	-4.34	
PB-TNTC-MW6	659.40	656.82	651.93	655.2	654.56	-0.64	
PB-WA-MW1	644.43	642.32	619.85	619.45	624.99	5.54	
PB-WA-MW2	633.65	631.16	629.59	631.91	628.75	-3.16	
PB-PR-MW7	633.99	631.5	626.32	631.65	629.64	-2.01	
PB-PR-MW8	635.02	632.5	624.55	629.98	627.56	-2.42	
PB-PR-MW9	633.70	630.7	622.92	630.12	626.57	-3.55	
PB-BED-MW13	648.27	645.81	607.85	619.29	621.79	2.5	
PB-BED-MW14	646.04	643.05	621.76	624.39	625.23	0.84	
PB-BED-MW15	631.64	629.08	603.54	598.91	610.22	11.31	
PB-BED-MW16	636.02	633.68	571.38	633.68	630.17	-3.51	
PB-BED-MW17	629.97	627.34	602.57	602.9	602.76	-0.14	
PB-BED-MW18	651.50	648.83	625.05	620.39	621.68	1.29	
PB-BED-MW19	643.07	640.5	621.07	623.52	622.92	-0.6	
PB-BED-MW20	676.33	673.57	661.35	661.28	661.98	0.7	
MK-MW10	640.89	638.06	626.66	Not Measured	632.23	--	
MK-MW11	637.69	634.71	625.22	631.36	628.89	-2.47	
MK-MW16	674.32	671.33	667.14	669.36	668.42	-0.94	
MK-MW17	664.64	660.97	659.58	661.1	660.56	-0.54	
MK-MW22	638.05	635.56	628.85	631.55	630.07	-1.48	
MK-MW23	639.07	636.95	620.88	628.12	632.14	4.02	
MK-MW24	657.12	654.44	648.31	650.77	649.61	-1.16	
IT-MW002	639.63	636.69	627.32	633.75	629.33	-4.42	
IT-MW005	634.99	631.91	620.19	629.62	623.36	-6.26	
IT-MW07	635.03	632.3	-	-	dry, < 627.3	--	piezometer
IT-MW08	633.16	630.6	-	-	619.96	--	new well/survey data
IT-MW09	647.45	645.4	-	-	dry, < 632	--	new well/survey data
IT-MW010	644.80	642.2	-	-	626.41	--	new well/survey data

Note: TOC and ground surface elevations were reported in Table 5-2 of Dames & Moore Site-Wide Groundwater Investigation report (Dames & Moore, 1996) unless otherwise indicated.

nitroaromatic compounds and metals in the disposal area; this area was designated by IT in December 1996, (IT, 1996) and approved by OEPA and Nashville USACE for use as the disposal site for IDW.

2.6 Land Surveying

The land surveys at the investigation sites were conducted in late October 1996 by a Ohio registered professional land surveyor and included both new and existing monitoring wells. Horizontal coordinates were surveyed to the closest 1.0 foot and referenced to both the Ohio State Plane Coordinate System and the NASA PBS coordination system. Vertical coordinates (land surface elevation and top of casing elevation) were surveyed to the nearest 0.01 foot and referenced to the 1929 National Geodetic Vertical Datum. Land survey data referenced to NASA PBS coordination system were utilized in generating site map and figures included in this report. The complete survey data based on two survey coordinations are presented in Appendix C.

2.7 Decontamination Procedures

Decontamination of sampling equipment was performed in accordance with the procedures prescribed in Section 4.4.3 of the SAP (IT, 1996a). A decontamination pad for the drill rig and drilling equipment was set up on the north side of the red barn, east of Campbell Street. This site was made available by NASA PBS for use during the investigation. Specifically, the drill rig and augers were steam-cleaned before and after each use. The sampling equipment, including hand augers, spoons, and pans, were decontaminated according to the following procedures:

- Rinse with potable water obtained from the PBS fire station.
- Wash and scrub using a brush with nonphosphatic detergent.
- Rinse with potable water
- Rinse with deionized water (American Society for Testing and Materials [ASTM]) Type II).
- Rinse with methanol followed by a hexane rinse.
- Final rinse with deionized water (ASTM Type II). The rinse volume was at least five times of the volume of methanol used.
- Air dry.
- Wrap in aluminum foil for transport to sampling locations.

2.8 Variances/Nonconformance

Variances are defined as necessary changes to the standard operating procedures employed in the field or office activities and modification to the original SOW as specified in the SAP (IT, 1996a) and the quality assurance project plan (QAPP) (IT, 1996c). Variances do not significantly affect the quality of the data or process being changed. However, nonconformances are defined as malfunctions, deficiencies, or deviations that may render the quality of information or data unacceptable or indeterminate. All nonconformance reports and variance logs were prepared by IT field personnel and are retained in project files.

Three nonconformance reports were generated during the GWI. The first report concerned the failure to conduct rising-head slug tests in two new monitoring wells (MW09 and MW10) due to extremely low well yield. The second nonconformance reported the failure to collect the groundwater sample from the piezometer installed in lieu of IT-MW07 due to the piezometer not producing any water. The last nonconformance report concerned the failure to collect the groundwater sample from monitoring well IT-MW09 due to the well not producing enough water at the time of sampling.

In addition, two variance logs were recorded during the GWI. One variance concerned the collection of an extra 1 liter of water for nitroaromatic analysis due to the elevated content of suspended solids in the groundwater samples. The other variance recorded the replacement of the proposed monitoring well IT-MW07 with a piezometer due to inaccessibility of the proposed drilling site.

3.0 Analytical Program

All groundwater samples for chemical analysis were analyzed by Quanterra Environmental Services located in Knoxville, Tennessee. The data quality evaluation (DQE) report was prepared by an IT project chemist and is provided in Appendix D. Data validation was performed by an independent third party contractor and the results are presented in Appendix E. The laboratory analytical data packages are included in Appendix F.

3.1 Analytical Parameters and Methodologies

Chemical analyses for the GWI were performed in accordance with guidelines in the U.S. Environmental Protection Agency (EPA) document entitled *Test Methods for Evaluating Solid Waste* (SW-846) (EPA, 1986). Methods used for analysis by the laboratory are shown in Table 3-1. All analytical data were reported in accordance with the EPA Level IV Contract Laboratory Program (CLP)-like data package and were in compliance with the EPA definitive data requirements. The regulatory compound/analyte list reported was the target compound list for organics and the target analyte list for inorganics as defined by the most recent CLP SOW. These data packages have been reviewed for completeness, accuracy, and representativeness as prescribed in the QAPP (IT, 1996c). All analytical data presented in this report were validated and blank corrected. Data validation was performed by an independent subcontractor and the validation summary is presented in Appendix E. All samples were submitted to the laboratory accompanied by an Analysis Request/Chain of Custody (AR/COC) form. The AR portion of the form provides project specific analytical specifications and QC instruction to the laboratories. A formal COC record was included as part of the document, ensuring documentation of custody for sample transportation, storage, and eventual disposition by the laboratory. Copies of all custody documentation are included in the data packages submitted. An assessment of the analytical data with regard to the project specific objectives is presented in Appendix B in the DQE report. In the DQE, all elements of data evaluation were compiled and used to determine the usability and overall applicability of the resulting data. Evaluation of the data using the specific data quality objectives established for the project resulted in the determination that the data set is valid and of sufficient quality to meet the objectives of the investigation. There were no significant problems observed that would adversely affect the application of the data or the success of the overall investigation.

Table 3-1

Summary of Analytical Methods for Groundwater Samples
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Analytical Parameters	Groundwater Analytical Method
TCL Volatile Organic Compounds	EPA SW-846 8260A
TCL Semivolatile Organic Compounds	EPA SW-846 3540/8270B
TAL Metals (Total and Dissolved)	EPA SW-846 3050A/6010A 7060A/7471A/7740
Pesticides/Polychlorinated Biphenyls	EPA SW-846 8081
Total Cyanide	EPA SW-846 9010A
Nitroaromatic Compounds	EPA SW-846 8330

TCL - Target compound list.
TAL - Target analyte list. Metals include Ag, Al, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Pb, Tl, V, Zn, As, Hg, and Se.

3rd Edition, September 1986 and subsequent revisions (Revision 1, December 1990, Update I, July 1992, and Update II, September 1994)

3.2 Blank Correction

The analytical data generated by the GWI were evaluated in regard to the results in associated field blanks, trip blanks, equipment rinsates, and laboratory method blanks. The method blank results reported with the analytical data were evaluated for high readings characteristic of background or process contamination. There were no significant concentrations detected in the designated blank samples that indicate any analytical process out of control or require further corrective action. The analytical data presented in this report were blank corrected as a function of the data validation process.

3.3 Screening Criteria

Groundwater analytical data were evaluated primarily using the risk-based concentrations (RBC) (EPA, 1996a). RBCs are media-specific contaminant levels used to eliminate selected contaminants from further consideration. The RBCs as developed by EPA Region III were calculated using toxicity data and standard risk-assessment exposure scenarios to produce concentrations at fixed levels of risk. The RBCs correspond to either a hazard quotient of 0.1 or a lifetime cancer risk of 10^{-6}, whichever occurs at a lower concentration. The cancer risk of 10^{-6} reflects the lower end of the target risk range as defined in the National Contingency Plan (EPA, 1990). Chemicals present in environmental media at concentrations below the RBCs will not contribute significantly to total site risk. RBCs are provided in the Region III tables for tap water, air, fish tissue, and soil. The groundwater chemical concentrations detected during the current investigation were compared with tap water RBCs in order to provide a conservative basis for the utilization of the data as well as for the decision-making process with regard to the site risk should future land use be changed.

Another screening criteria often used in evaluation of groundwater contamination is the maximum contamination level (MCL) from EPA Drinking Water Regulations and Health Advisories (EPA, 1996b). The MCLs are the maximum permissible levels of contaminants in water that is delivered to any user of a public system. The MCLs were not used explicitly in the evaluation of groundwater analytical data acquired during this GWI because the MCLs are less stringent than the RBCs in determining the potential site risk associated with groundwater contamination.

4.0 Analytical Results

A total of 28 existing and 2 new monitoring wells were sampled during the GWI at PBOW. Of these, 22 wells are screened to monitor the overburden and 8 are screened in the limestone bedrock. Because the wells are located in various locations across the PBOW site, the following presentation of analytical results is divided by geographic area and the monitored water-bearing zone. All detected constituents in groundwater samples are presented by well on Tables 4-1 through 4-3 and on Tables 4-4 through 4-6 for bedrock wells. Note that the discussion of analytical results focuses on those constituents that were detected at concentrations exceeding the respective RBCs. Overburden monitoring well locations are presented on Figure 4-1, and analytical results exceeding RBCs in these wells are shown on Figures 4-2 through 4-6. Figure 4-7 presents bedrock monitoring well locations, and Figures 4-8 through 4-10 present analytical results exceeding RBCs in these wells.

4.1 West Area Red Water Pond and TNT Area C

Eleven overburden and three bedrock wells were sampled in the vicinity of the WARWP and TNTC. These wells are summarized as follows:

- Overburden wells
  - IT-MW10 (renamed from IT-MW06), new well located in the WARWP.
  - IT-MW08, new well located in the WARWP.
  - IT-MW02, existing well located in the WARWP.
  - WA-MW01, existing well located in the WARWP.
  - WA-MW02, existing well located in the WARWP.
  - MK-MW10, existing well located north of the WARWP.
  - MK-MW11, existing well located north of the WARWP.
  - TNTC-MW03, existing well located in TNTC.
  - TNTC-MW04, existing well located in TNTC.
  - TNTC-MW05, existing well located in TNTC.
  - TNTC-MW06, existing well located in TNTC.

- Bedrock wells
  - BED-MW13, existing well located in TNTC.
  - BED-MW14, existing well located in the WARWP.
  - BED-MW19, existing well located north of the WARWP.

The following sections present the analytical results for the 11 overburden wells followed by the three bedrock wells. This discussion is divided by the monitored water-bearing zone and analytical parameters.

Table 4-1

Summary of Volatile and Semivolatile Organic Analytical Results
Overburden Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Sample Location:		IT-MW10		IT-MW08		PB-TNTA-MW10		PB-TNTA-MW11		PB-TNTC-MW3		PB-TNTC-MW4		PB-TNTC-MW5	
Sample Number:		5010		5030		5050		5060		5070		5080		5090	
Sample Date:		10/18/96		10/17/96		9/27/96		9/27/96		9/27/96		9/30/96		9/30/96	
Sample Filtration:		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered
Parameter	RBC[a]	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Volatile Organic Compounds															
Acetone	370	ND[b]	ND	ND	ND	23 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	0.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	3.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Benzene	130	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	75	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	1200	ND	ND	ND	ND	ND	ND	ND	ND	1.0 J	ND	ND	ND	ND	ND
Semivolatile Organic Compounds															
bis(2-Ethylhexyl)phthalate	4.8	ND	ND	ND	ND	ND	ND	ND	ND	1.2 J	ND	ND	ND	ND	ND
2,4-Dinitrophenol	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	7.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	3.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol	180	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	230	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol	0.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	150	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	2200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4-1

Summary of Volatile and Semivolatile Organic Analytical Results
Overburden Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Sample Location:		PB-TNTC-MW6		PB-WA-MW1		PB-WA-MW2		PB-PR-MW7		PB-PR-MW8		PB-PR-MW9		MK-MW10		MK-MW11	
Sample Number:		5100		5110		5120		5130		5140		5150		5240		5250	
Sample Date:		10/2/96		9/30/96		9/30/96		10/21/96		10/20/96		10/20/96		9/27/96		9/27/96	
Sample Filtration:		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltere	filtered	unfiltere	filtered
Parameter	RBC[a]	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Volatile Organic Compounds																	
Acetone	370	ND[b]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4 J	ND	ND	ND
Benzene	0.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	3.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1 J	ND	ND	ND
Ethyl Benzene	130	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	75	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1 J	ND	ND	ND
Xylenes (total)	1200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Semivolatile Organic Compounds																	
bis(2-Ethylhexyl)phthalate	4.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	na	ND	ND	ND	ND	ND	ND	ND	ND	***690 J***	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	7.3	ND	ND	ND	ND	**30**	ND	ND	ND	**530**	ND	**30**	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	3.7	ND	ND	ND	ND	2.8 J	ND	**70**	ND	**52 J**	ND	**6.8 J**	ND	ND	ND	ND	ND
2-Methylnaphthalene	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol	180	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	230	ND	ND	ND	ND	ND	ND	5.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitroaniline	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	***2.0 J***	ND	ND	ND	ND	ND
3-Nitroaniline	11	ND	ND	ND	ND	**110 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol	0.18	ND	ND	ND	ND	ND	ND	ND	ND	**870 J**	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	150	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	2200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4-1

Summary of Volatile and Semivolatile Organic Analytical Results
Overburden Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Sample Location:		MK-MW16		MK-MW17		MK-MW22		MK-MW23		MK-MW24		IT-MW02		IT-MW05	
Sample Number:		5260		5270		5280		5290		5300		5310		5320	
Sample Date:		9/30/96		10/21/96		10/22/96		10/23/96		10/22/96		9/30/96		10/20/96	
Sample Filtration:		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered
Parameter	RBC[a]	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Volatile Organic Compounds															
Acetone	370	ND[b]	ND[b]	ND	ND[b]	ND[b]	ND[b]	ND[b]	ND[b]	ND[b]	ND[b]	ND[b]	ND[b]	ND	ND
Benzene	0.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	3.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3 J	ND
Ethyl Benzene	130	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	75	ND	ND	1.8 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1 J	ND
Xylenes (total)	1200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Semivolatile Organic Compounds															
bis(2-Ethylhexyl)phthalate	4.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	7.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**110 J**	ND	ND	ND
2,6-Dinitrotoluene	3.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**16 J**	ND	ND	ND
2-Methylnaphthalene	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol	180	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	230	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.1 J	ND	ND	ND
4,6-Dinitro-2-methylphenol	0.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**60 J**	ND	ND	ND
4-Methylphenol	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	150	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	2200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

[a] RBC value in µg/L for groundwater.

[b]ND - Compound analyzed for but below detection limit (non-detect).

60 J Detected concentration exceeds or equal to RBC.

690 J RBC not established for this compound.

Table 4-2

Summary of Explosives and Pesticides/PCB Analytical Results
Overburden Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Sample Location:		IT-MW10		IT-MW08		PB-TNTA-MW10		PB-TNTA-MW11		PB-TNTC-MW3		PB-TNTC-MW4		PB-TNTC-MW5	
Sample Number:		5010		5030		5050		5060		5070		5080		5090	
Sample Date:		10/18/96		10/17/96		9/27/96		9/27/96		9/27/96		9/30/96		9/30/96	
Sample Filtration:		unfiltered	filtered	unfiltered		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered
Parameter	RBC[a]	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Nitroaromatic Compounds (Explosives)															
1,3,5-Trinitrobenzene	0.18	ND[b]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dinitrobenzene	0.37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trinitrotoluene	2.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	7.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	3.7	0.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Amino-2,6-dinitrotoluene	0.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrotoluene	6.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	0.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RDX	0.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetryl	37	0.41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides/PCBs															
Pesticides and PCBs were all below detection limits.															

Table 4-2

Summary of Explosives and PCB/Pesticides Analytical Results
Overburden Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Sample Location:		PB-TNTC-MW6		PB-WA-MW1		PB-WA-MW2		PB-PR-MW7		PB-PR-MW8		PB-PR-MW9		MK-MW10	
Sample Number:		5100		5110		5120		5130		5140		5150		5240	
Sample Date:		10/2/96		9/30/96		9/30/96		10/21/96		10/20/96		10/20/96		9/27/96	
Sample Filtration:		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered
Parameter	RBC[a]	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Nitroaromatic Compounds (Explosives)															
1,3,5-Trinitrobenzene	0.18	ND[b]	ND	ND	ND	**11**	ND	**2000**	**2400**	**1700**	**2100 J**	**27**	ND	ND	ND
1,3-Dinitrobenzene	0.37	ND	ND	ND	ND	**18**	ND	**1400**	**1600**	**1400**	**1700 J**	**57**	ND	ND	ND
2,4,6-Trinitrotoluene	2.2	ND	ND	ND	ND	**2.4**	ND	ND	ND	ND	**160 J**	ND	ND	ND	ND
2,4-Dinitrotoluene	7.3	ND	ND	ND	ND	**12**	ND	**1100**	**1400**	**1400**	**1400 J**	**36**	ND	ND	ND
2,6-Dinitrotoluene	3.7	ND	ND	ND	ND	ND	ND	**310**	**300**	ND	ND	ND	ND	ND	ND
4-Amino-2,6-dinitrotoluene	0.22	ND	ND	ND	ND	**1.1**	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrotoluene	6.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	0.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RDX	0.61	ND	ND	ND	ND	ND	ND	ND	**310**	ND	**630 J**	ND	ND	ND	ND
Tetryl	37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides/PCBs															
Pesticides and PCBs were all below detection limits.															

Table 4-2

Summary of Explosives and Pesticides/PCB Analytical Results
Overburden Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Sample Location:		MK-MW11		MK-MW16		MK-MW17		MK-MW22		MK-MW23		MK-MW24		IT-MW02		IT-MW05	
Sample Number:		5250		5260		5270		5280		5290		5300		5310		5320	
Sample Date:		9/27/96		9/30/96		10/21/96		10/22/96		10/23/96		10/22/96		9/30/96		10/20/96	
Sample Filtration:		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered
Parameter	RBC[a]	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Nitroaromatic Compounds (Explosives)																	
1,3,5-Trinitrobenzene	0.18	ND[b]	ND	ND	ND	ND	**2.3**	**0.34 J**	ND	ND	ND	ND	ND	**9.7**	ND	ND	ND
1,3-Dinitrobenzene	0.37	ND	ND	ND	ND	**2.2**	ND	0.26	ND	ND	ND	ND	ND	**12**	ND	ND	ND
2,4,6-Trinitrotoluene	2.2	ND	ND	ND	ND	ND	**3.4 J**	0.99	0.62	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	7.3	ND	ND	ND	ND	ND	2.2	0.24	0.22	ND	ND	ND	ND	**20**	ND	ND	ND
2,6-Dinitrotoluene	3.7	ND	ND	ND	ND	**11 J**	**11 J**	0.87	0.69	0.44	ND	ND	ND	2.3	ND	ND	ND
4-Amino-2,6-dinitrotoluene	0.22	ND	ND	ND	ND	**8.7 J**	**5.8**	**1.1**	**0.63**	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrotoluene	6.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	0.34	ND	ND	ND	ND	ND	ND	**0.91**	**0.68**	ND	ND	ND	ND	ND	ND	ND	ND
RDX	0.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11**	ND	ND	ND
Tetryl	37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides/PCBs																	
Pesticides and PCBs were all below detection limits.																	

[a] RBC value in µg/ L for groundwater.

[b]ND - Compound analyzed for but below detection limit (non-detect).

2.3 Detected concentration exceeds RBC.

Table 4-3

Summary of Metal and Cyanide Analytical Results
Overburden Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

(Page 1-3)

Sample Location:		IT-MW10		IT-MW08		PB-TNTA-MW10		PB-TNTA-MW11		PB-TNTC-MW3		PB-TNTC-MW4		PB-TNTC-MW5	
Sample Number:		5010		5030		5050		5060		5070		5080		5090	
Sample Date:		10/18/96		10/17/96		9/27/96		9/27/96		9/27/96		9/30/96		9/30/96	
Sample Filtration:		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered
Parameter	RBC[a]	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
Metals															
Aluminum	3.7	**4.35 J**	ND[b]	0.468	ND	**ND**	ND	1.92	ND	**9.54**	ND	**6.59**	ND	1.96	ND
Antimony	0.0015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.000045	**0.0142**	ND	ND	ND	**0.0122**	ND	**0.0125**	ND	**0.0516**	ND	**0.0478**	ND	ND	ND
Barium	0.26	**0.264**	ND	ND	ND	0.229	0.212	ND	ND	**0.286**	ND	ND	ND	ND	ND
Beryllium	0.000016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	0.0018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.018	**0.0221**	ND	0.0153	0.0171	**ND**	0.01	0.0175	ND	**0.0575**	0.015	**0.0469**	ND	0.0174	ND
Cobalt	0.22	ND	ND	ND	ND	ND	ND	ND	ND	0.131	0.112	ND	ND	ND	ND
Copper	0.15	ND	ND	ND	ND	0.0331	ND	ND	ND	0.0486	ND	0.0318	ND	ND	ND
Iron	1.1	**16.7**	ND	0.997	0.144	**26.2**	**19.5**	**11.5**	ND	**41.1**	ND	**36.8**	0.188	**6.54**	ND
Lead	0.015	**0.0216**	0.0036	ND	ND	**ND**	ND	0.0129	ND	**0.0477**	**0.0361**	**0.0364**	**0.0209**	**0.0236**	ND
Manganese	0.073	**2.96**	**1.63**	**0.263**	**0.211**	**2.74**	**2.58**	**0.457**	**0.526**	**5.1**	**5.3 J**	**1.13**	**0.998 J**	**0.717**	**0.503 J**
Mercury	0.0011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	0.073	ND	ND	ND	ND	ND	ND	ND	ND	0.198	ND	0.0466	ND	ND	ND
Silver	0.018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	0.018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.00023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	0.026	ND	ND	**0.0574**	**0.0625**	ND	ND	ND	ND	**0.0877**	**0.0686**	**0.0701**	**0.0525**	ND	ND
Zinc	1.1	0.126	0.0479	ND	0.0334	0.036	0.0263	0.0791	ND	0.133	0.0419	0.112	0.32	0.0489	0.045
Cyanide (total)															
Cyanide	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4-3

Summary of Metal and Cyanide Analytical Results
Overburden Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

(Page 2-3)

Sample Location:		PB-TNTC-MW6		PB-WA-MW1		PB-WA-MW2		PB-PR-MW7		PB-PR-MW8		PB-PR-MW9		MK-MW10	
Sample Number:		5100		5110		5120		5130		5140		5150		5240	
Sample Date:		10/2/96		9/30/96		9/30/96		10/21/96		10/20/96		10/20/96		9/27/96	
Sample Filtration:		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	fileterd	unfiltered	filtered	unfiltered	filtered
Parameter	RBC[a]	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
Metals															
Aluminum	3.7	2.66 J	ND[b]	1.6	ND	**13.4**	ND	2.55 J	ND	0.965 J	0.859	ND	ND	**11.1**	
Antimony	0.0015	ND	ND	ND	ND	ND	ND	ND	ND	**0.076**	ND	**0.0783**	ND	ND	ND
Arsenic	0.000045	ND	ND	ND	ND	**0.011**	ND	ND	ND	ND	ND	ND	ND	**0.01**	ND
Barium	0.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium	0.000016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	0.0018	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.0072**	ND	ND	ND	ND
Chromium	0.018	**0.0507**	0.0149	0.0114	ND	**0.0307**	0.0119	**0.0355**	**0.0331**	**0.149**	**0.15**	**0.0279**	**0.0266**	**0.0247**	ND
Cobalt	0.22	ND	ND	ND	ND	0.114	0.0662	**2.25**	**2.24**	**6.34**	**6.48**	**0.762**	**0.692**	ND	ND
Copper	0.15	ND	ND	ND	ND	0.0633	0.0312	**0.964**	**0.931 J**	**4.68**	**4.71 J**	**0.445**	**0.414**	0.0318	ND
Iron	1.1	**9.94**	0.146	**4.3**	ND	**26.8**	0.138	**6.01**	**1.15**	**13.3**	**13.2**	**1.75**	**1.19**	**26.5**	ND
Lead	0.015	ND	ND	0.0052	ND	0.0132	0.0046	ND	ND	ND	ND	ND	ND	**0.0439**	ND
Manganese	0.073	**2.58**	**2.54**	**0.342**	**0.364 J**	**1.54**	**0.913 J**	**13.6**	**15.2**	**30.7**	**30.9**	**2.28**	**2.14**	**0.412**	0.0235 J
Mercury	0.0011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	0.073	ND	ND	ND	ND	**0.207**	**0.123**	**1.69**	**1.63 J**	**6.08**	**6.23 J**	**1.06**	**0.963 J**	ND	ND
Silver	0.018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	0.018	ND	ND	ND	ND	0.0079	0.006	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.00023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	0.026	ND	ND	ND	ND	**0.0705**	ND	**0.0628**	**0.0683**	**0.0652**	**0.0673**	**0.0589**	**0.0566**	ND	ND
Zinc	1.1	0.0831	0.0329	0.0663	0.0446	0.107	0.0245	0.119	0.0859	ND	0.183	ND	0.674	0.0974	0.032
Cyanide (total)															
Cyanide	na	ND	ND	ND	ND	***0.057***	ND	***0.19***	ND	***0.43***	ND	***0.062***	ND	ND	ND

Table 4-3

Summary of Metal and Cyanide Analytical Results
Overburden Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

(Page 3-3)

Sample Location:		MK-MW11		MK-MW16		MK-MW17		MK-MW22		MK-MW23		MK-MW24		IT-MW02		IT-MW05	
Sample Number:		5250		5260		5270		5280		5290		5300		5310		5320	
Sample Date:		9/27/96		10/20/96		10/21/96		10/22/96		10/23/96		10/22/96		9/30/96		10/20/96	
Sample Filtration:		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered
Parameter	RBC[a]	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
Metals (mg/L)																	
Aluminum	3.7	1.97	ND	**3.76**	1.11	0.658	ND	2.04	ND	ND	ND	1.21	ND	0.431	ND	1.52 J	0.248
Antimony	0.0015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.000045	ND	ND	ND	ND	**0.0102**	**0.0114**	ND	ND	ND	**0.0104**	ND	ND	ND	ND	**0.0136**	ND
Barium	0.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.277**	0.236
Beryllium	0.000016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	0.0018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.018	0.0121	ND	0.0106	ND	ND	ND	ND	ND	ND	ND	0.0162	ND	ND	ND	0.0116	ND
Cobalt	0.22	ND	ND	ND	0.0959	0.0785	0.0795	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	0.15	ND	ND	0.0262	0.0489	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	1.1	**8.02**	ND	**12.1**	0.391	**34.8**	**38.3**	**4.52**	ND	ND	ND	**4.72**	ND	**1.12**	ND	**7.84**	ND
Lead	0.015	**0.0376**	0.0097	**0.0348**	ND	0.0034	ND	0.0076	ND	ND	ND	**0.004**	ND	**0.0277**	**0.0284**	ND	0.0052
Manganese	0.073	**0.978**	ND	**12**	**11.6 J**	**1.43**	**1.68**	**0.643**	**0.269**	ND	ND	**0.348**	ND	**1.23**	**1.19 J**	**0.459**	**0.195**
Mercury	0.0011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	0.073	ND	ND	**0.114**	**0.148**	**0.156**	**0.182**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	0.018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.00023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	0.026	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.0682**	**0.0676**	ND	ND	ND	ND
Zinc	1.1	0.0454	0.0441	0.0954	0.121	0.119	0.114	0.089	0.0248	ND	ND	0.126	ND	0.0322	0.071	ND	ND
Cyanide (total)																	
Cyanide	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NC	***0.026***	ND	ND	ND

[a] RBC value in mg/L for groundwater.
[b] ND - Compound analyzed for but below detection limit (non-detect).

11.1 Detected concentration exceeds or equals to RBC.

0.057 RBC not established for this compound.

Table 4-4

Summary of Volatile and Semivolatile Organic Analytical Results
Bedrock Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Sample Location:		PB-BED-MW13		PB-BED-MW14		PB-BED-MW15		PB-BED-MW16		PB-BED-MW17		PB-BED-MW18		PB-BED-MW19		PB-BED-MW20	
Sample Number:		5160		5170		5180		5190		5200		5210		5220		5230	
Sample Date:		10/17/96		10/17/96		10/21/96		10/25/96		10/24/96		10/22/96		10/17/96		10/23/96	
Sample Filtration:		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered
Parameter	RBC[a]	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Volatile Organic Compounds																	
Benzene	0.36	**190**	ND[b]	ND	ND	**1300**	ND	**810**	ND	**18**	ND	**7.9**	ND	**3.7 J**	ND	ND	ND
Carbon Disulfide	100	3.7 J	ND	ND	ND	ND	ND	19 J	ND	6.0 J	ND	3.1 J	ND	ND	ND	ND	ND
Chlorobenzene	3.9	ND	ND	1.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	0.15	ND	ND	ND	ND	**8.6 J**	ND	**7.8 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Benzene	130	86	ND	ND	ND	**180**	ND	**180**	ND	87	ND	**130**	ND	2.4 J	ND	ND	ND
Toluene	75	**190**	ND	1.5 J	ND	**800**	ND	**540**	ND	**140**	ND	73	ND	2.0 J	ND	ND	ND
Xylenes (total)	1200	860	ND	2.7 J	ND	1100	ND	**1300**	ND	380	ND	560	ND	19	ND	ND	ND
Semivolatile Organic Compounds																	
bis(2-Ethylhexyl)phthalate	4.8	4.7 J	ND	1.0 J	ND	**14 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	na	***13 J***	ND	ND	ND	***16 J***	ND	ND	ND	ND	ND	***16***	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	7.3	ND	ND	1.7 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	30	**34**	ND	ND	ND	**72 J**	ND	**69 J**	ND	17 J	ND	11	ND	3.5 J	ND	ND	ND
2-Methylphenol	180	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7 J	ND	ND	ND	ND	ND
4-Methylphenol	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.3 J	ND	ND	ND	ND	ND
Naphthalene	150	36	ND	ND	ND	52 J	ND	51 J	ND	17 J	ND	18	ND	2.2 J	ND	ND	ND
Phenol	2200	ND	ND	ND	ND	40 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

[a] RBC value in µg/L for groundwater.

[b]ND - Compound analyzed for but below detection limit (non-detected).

190 Detected concentration exceeds or equals to RBC.

13 J RBC not established for this compound.

Table 4-5

Summary of Explosives and Pesticides/PCB Analytical Results
Bedrock Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Sample Location:		PB-BED-MW13		PB-BED-MW14		PB-BED-MW15		PB-BED-MW16		PB-BED-MW17		PB-BED-MW18		PB-BED-MW19		PB-BED-MW20	
Sample Number:		5160		5170		5180		5190		5200		5210		5220		5230	
Sample Date:		10/17/96		10/17/96		10/21/96		10/25/96		10/24/96		10/22/96		10/17/96		10/23/96	
Sample Filtration:		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered
Parameter	RBC[a]	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Nitroaromatic Compounds (Explosives)																	
1,3,5-Trinitrobenzene	0.18	ND[b]	ND	ND	ND	**0.52**	**0.8**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dinitrobenzene	0.37	0.22	0.2	ND	ND	**0.44**	**0.66**	ND	ND	ND	ND	0.31	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	3.7	0.66	ND	ND	ND	ND	ND	1.4	1.9	ND	ND	ND	ND	ND	ND	ND	ND
4-Amino-2,6-dinitrotoluene	0.22	**4.4**	**3.9**	ND	ND	ND	ND	ND	ND	ND	ND	**4**	**21**	ND	ND	ND	ND
2-Nitrotoluene	6.1	ND	ND	ND	ND	ND	ND	ND	ND	0.72 J	0.47 J	0.33 J	ND	ND	ND	ND	ND
Nitrobenzene	0.34	**0.5**	ND	ND	ND	ND	ND	ND	ND	**0.5**	**0.51**	ND	ND	**0.5**	**0.4**	ND	ND
RDX	0.61	ND	ND	ND	ND	**3.7**	**6.3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetryl	37	1.8	ND	ND	ND	1.7	2.3	ND	1.6	0.74	ND	ND	ND	ND	ND	ND	ND
Pesticides/PCBs																	
Pesticides and PCBs were all below detection limits.																	

[a] RBC value in µg/L for groundwater.

190 Detected concentration exceeds or equals to RBC.

[b]ND - Compound analyzed for but below detection limit (non-detect).

Table 4-6

Summary of Metal and Cyanide Analytical Results
Bedrock Monitoring Wells
Sitewide Groundwater Investigation
Former Plum Brook Ordnance Works, Sandusky, Ohio

Sample Location:		PB-BED-MW13		PB-BED-MW14		PB-BED-MW15		PB-BED-MW16		PB-BED-MW17		PB-BED-MW18		PB-BED-MW19		PB-BED-MW20	
Sample Number:		5160		5170		5180		5190		5200		5210		5220		5230	
Sample Date:		10/17/96		10/17/96		10/21/96		10/25/96		10/24/96		10/22/96		10/17/96		10/23/96	
Sample Filtration:		unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered
Parameter	RBC[a]	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
Metals																	
Aluminum	3.7	ND[b]	ND	ND	0.246	ND	ND	0.387	ND	ND	ND	0.317	ND	ND	0.378	0.548	ND
Antimony	0.0015	ND	ND	ND	ND	**0.0776**	**0.0696**	**0.0931**	ND	**0.0614**	ND	**0.109**	ND	ND	ND	**0.0963**	ND
Arsenic	0.000045	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.0111**	ND	ND	ND	ND	ND	ND
Barium	0.26	**3.7**	**3.3**	ND	ND	**1.85**	**2.39**	**1.21**	ND	**1.23**	ND	**1.29**	ND	**2.13**	**1.94**	**26.4**	ND
Chromium	0.018	0.0108	0.0134	0.0123	0.0116	ND	ND	**0.0334**	ND	ND	ND	ND	ND	0.0138	ND	0.0149	ND
Cobalt	0.22	ND	ND	0.0691	0.0538	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	1.1	0.187	ND	0.45	ND	ND	ND	ND	ND	**428**	ND	0.358	ND	0.129	ND	**5.76**	ND
Lead	0.015	ND	ND	ND	ND	ND	ND	ND	**0.0444**	**0.0263**	ND	ND	ND	ND	ND	ND	ND
Manganese	0.073	0.021	0.016	0.0475	0.025	0.0169	0.0272	**10.3**	ND	ND	ND	**0.131**	ND	0.0205	0.0165	**0.173**	ND
Mercury	0.0011	ND	ND	ND	0.00025	ND	ND	ND	ND	ND	ND	0.00024	ND	ND	ND	ND	ND
Nickel	0.073	ND	ND	0.0681	0.0535	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	0.026	**0.0524**	**0.0553**	ND	ND	ND	ND	**0.362**	**0.14**	ND	ND	ND	ND	ND	ND	**0.0594**	ND
Zinc	1.1	ND	0.0402	ND	0.026	0.0228	0.0228	0.0735	ND	ND	ND	0.0367	ND	0.03 J	ND	0.0243	ND
Cyanide (total)																	
Cyanide	na	ND	ND	***0.02***	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

[a] RBC value in mg/L for groundwater.

[b] ND - Compound analyzed for but below detection limit (non-detect).

190 Detected concentration exceeds or equals to RBC.

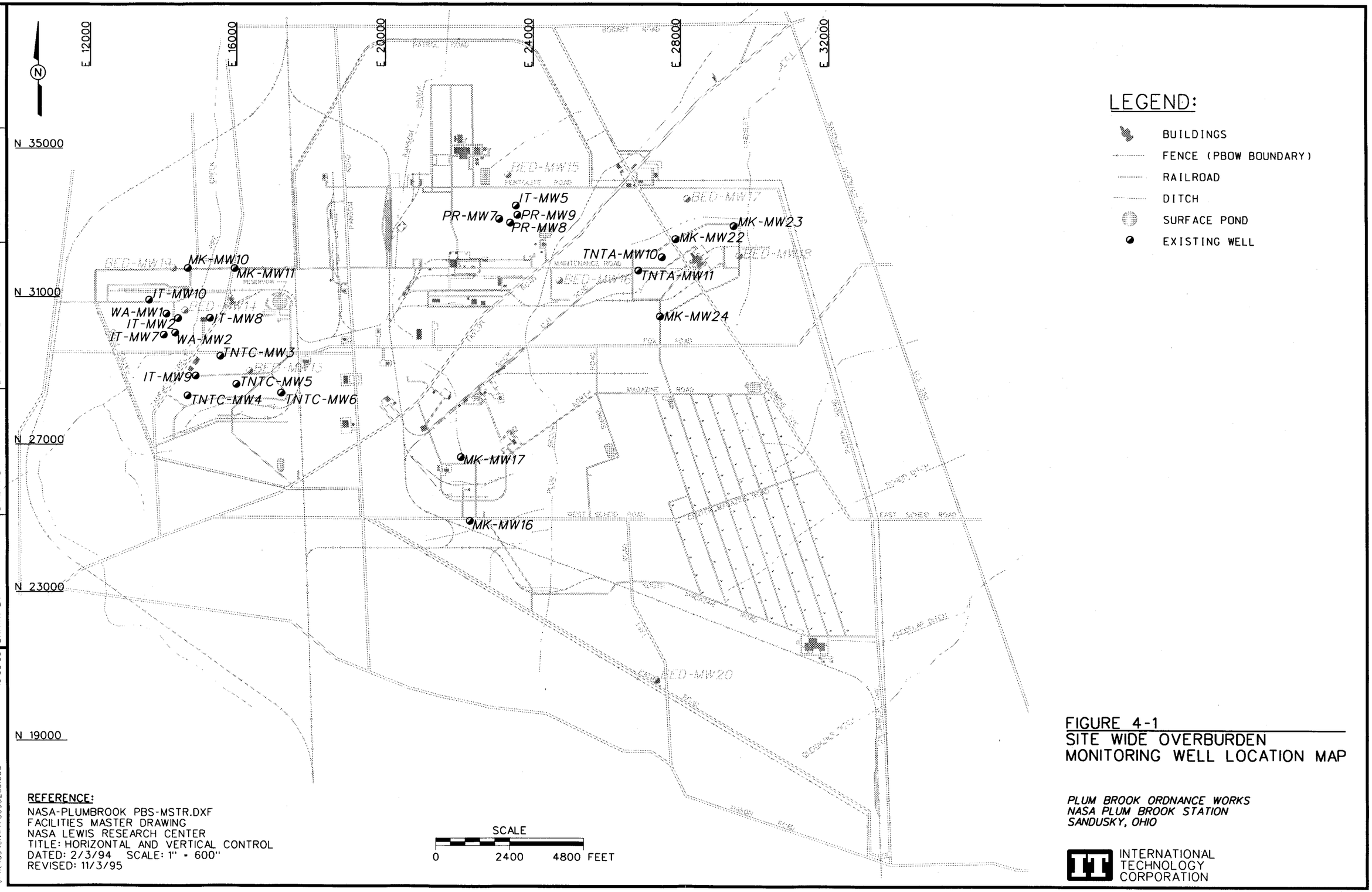
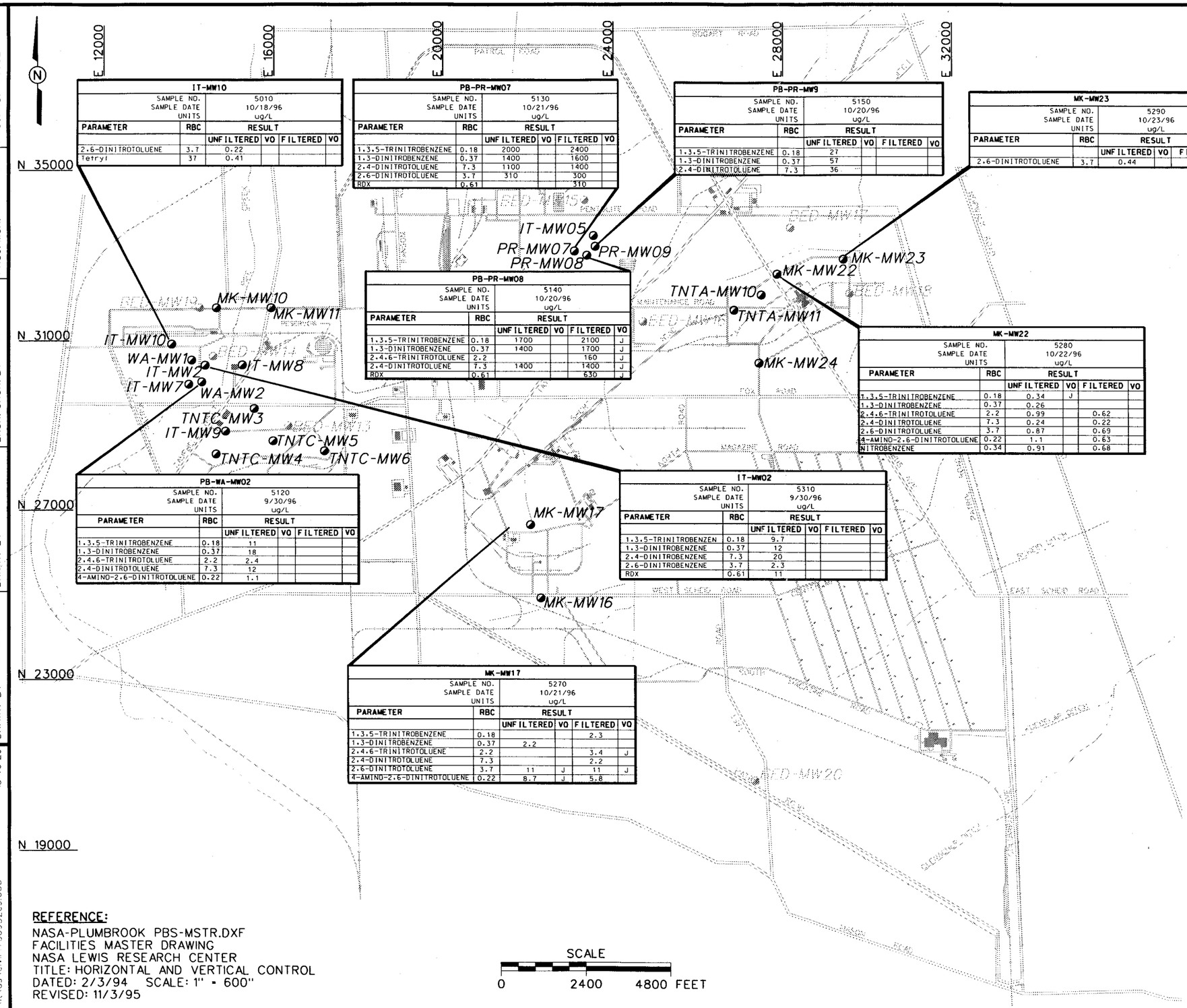


FIGURE 4-1
SITE WIDE OVERBURDEN
MONITORING WELL LOCATION MAP

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO



IT-MW10

SAMPLE NO.		5010			
SAMPLE DATE		10/18/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
2,6-DINITROTOLUENE	3.7	0.22			
Tetryl	37	0.41			

PB-PR-MW07

SAMPLE NO.		5130			
SAMPLE DATE		10/21/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
1,3,5-TRINITROBENZENE	0.18	2000		2400	
1,3-DINITROBENZENE	0.37	1400		1600	
2,4-DINITROTOLUENE	7.3	1100		1400	
2,6-DINITROTOLUENE	3.7	310		300	
RDX	0.61			310	

PB-PR-MW9

SAMPLE NO.		5150			
SAMPLE DATE		10/20/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
1,3,5-TRINITROBENZENE	0.18	27			
1,3-DINITROBENZENE	0.37	57			
2,4-DINITROTOLUENE	7.3	36			

MK-MW23

SAMPLE NO.		5290			
SAMPLE DATE		10/23/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
2,6-DINITROTOLUENE	3.7	0.44			

PB-PR-MW08

SAMPLE NO.		5140			
SAMPLE DATE		10/20/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
1,3,5-TRINITROBENZENE	0.18	1700		2100	J
1,3-DINITROBENZENE	0.37	1400		1700	J
2,4,6-TRINITROTOLUENE	2.2			160	J
2,4-DINITROTOLUENE	7.3	1400		1400	J
RDX	0.61			630	J

MK-MW22

SAMPLE NO.		5280			
SAMPLE DATE		10/22/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
1,3,5-TRINITROBENZENE	0.18	0.34	J		
1,3-DINITROBENZENE	0.37	0.26			
2,4,6-TRINITROTOLUENE	2.2	0.99		0.62	
2,4-DINITROTOLUENE	7.3	0.24		0.22	
2,6-DINITROTOLUENE	3.7	0.87		0.69	
4-AMINO-2,6-DINITROTOLUENE	0.22	1.1		0.63	
NITROBENZENE	0.34	0.91		0.68	

PB-WA-MW02

SAMPLE NO.		5120			
SAMPLE DATE		9/30/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
1,3,5-TRINITROBENZENE	0.18	11			
1,3-DINITROBENZENE	0.37	18			
2,4,6-TRINITROTOLUENE	2.2	2.4			
2,4-DINITROTOLUENE	7.3	12			
4-AMINO-2,6-DINITROTOLUENE	0.22	1.1			

IT-MW02

SAMPLE NO.		5310			
SAMPLE DATE		9/30/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
1,3,5-TRINITROBENZEN	0.18	9.7			
1,3-DINITROBENZENE	0.37	12			
2,4-DINITROBENZENE	7.3	20			
2,6-DINITROBENZENE	3.7	2.3			
RDX	0.61	11			

MK-MW17

SAMPLE NO.		5270			
SAMPLE DATE		10/21/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
1,3,5-TRINITROBENZENE	0.18			2.3	
1,3-DINITROBENZENE	0.37	2.2			
2,4,6-TRINITROTOLUENE	2.2			3.4	J
2,4-DINITROTOLUENE	7.3			2.2	
2,6-DINITROTOLUENE	3.7	11	J	11	J
4-AMINO-2,6-DINITROTOLUENE	0.22	8.7	J	5.8	

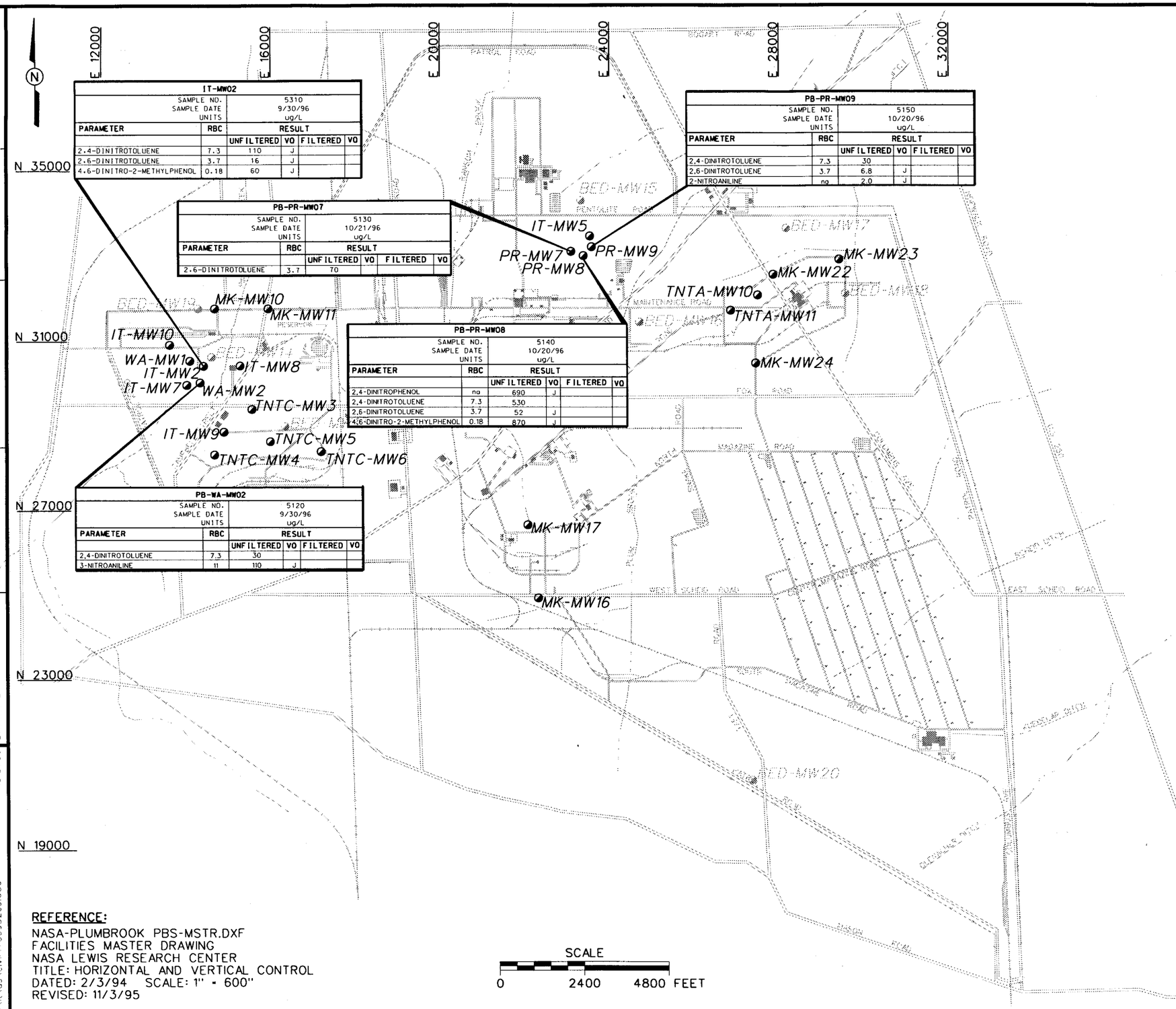
REFERENCE:
NASA-PLUMBROOK PBS-MSTR.DXF
FACILITIES MASTER DRAWING
NASA LEWIS RESEARCH CENTER
TITLE: HORIZONTAL AND VERTICAL CONTROL
DATED: 2/3/94 SCALE: 1" = 600"
REVISED: 11/3/95

FIGURE 4-2
DETECTED NITROAROMATIC COMPOUNDS IN OVERBURDEN WELLS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: R. KNIGHT | ENGR. CHCK. BY: G. YU | INITIATOR: G. YU | PROJ. MGR.: D. BURTON | DWG. NO.: 766952es.035 | PROJ. NO.: 766952
STARTING DATE: 3/31/97 | DRAWN BY: R. KNIGHT | DATE LAST | DRAWN BY:
23 SEP 97 15:40:29 rvanderg c:\it\ds\cvr\766952es.035



IT-MW02					
SAMPLE NO.		5310			
SAMPLE DATE		9/30/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
2,4-DINITROTOLUENE	7.3	110	J		
2,6-DINITROTOLUENE	3.7	16	J		
4,6-DINITRO-2-METHYLPHENOL	0.18	60	J		

PB-PR-MW09					
SAMPLE NO.		5150			
SAMPLE DATE		10/20/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
2,4-DINITROTOLUENE	7.3	30			
2,6-DINITROTOLUENE	3.7	6.8	J		
2-NITROANILINE	na	2.0	J		

PB-PR-MW07					
SAMPLE NO.		5130			
SAMPLE DATE		10/21/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
2,6-DINITROTOLUENE	3.7	70			

PB-PR-MW08					
SAMPLE NO.		5140			
SAMPLE DATE		10/20/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
2,4-DINITROPHENOL	na	690	J		
2,4-DINITROTOLUENE	7.3	530			
2,6-DINITROTOLUENE	3.7	52	J		
4,6-DINITRO-2-METHYLPHENOL	0.18	870	J		

PB-WA-MW02					
SAMPLE NO.		5120			
SAMPLE DATE		9/30/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
2,4-DINITROTOLUENE	7.3	30			
3-NITROANILINE	11	110	J		

LEGEND:

- BUILDINGS
- FENCE (PBOW BOUNDARY)
- RAILROAD
- DITCH
- SURFACE POND
- EXISTING WELL

REFERENCE:
NASA-PLUMBROOK PBS-MSTR.DXF
FACILITIES MASTER DRAWING
NASA LEWIS RESEARCH CENTER
TITLE: HORIZONTAL AND VERTICAL CONTROL
DATED: 2/3/94 SCALE: 1" = 600"
REVISED: 11/3/95

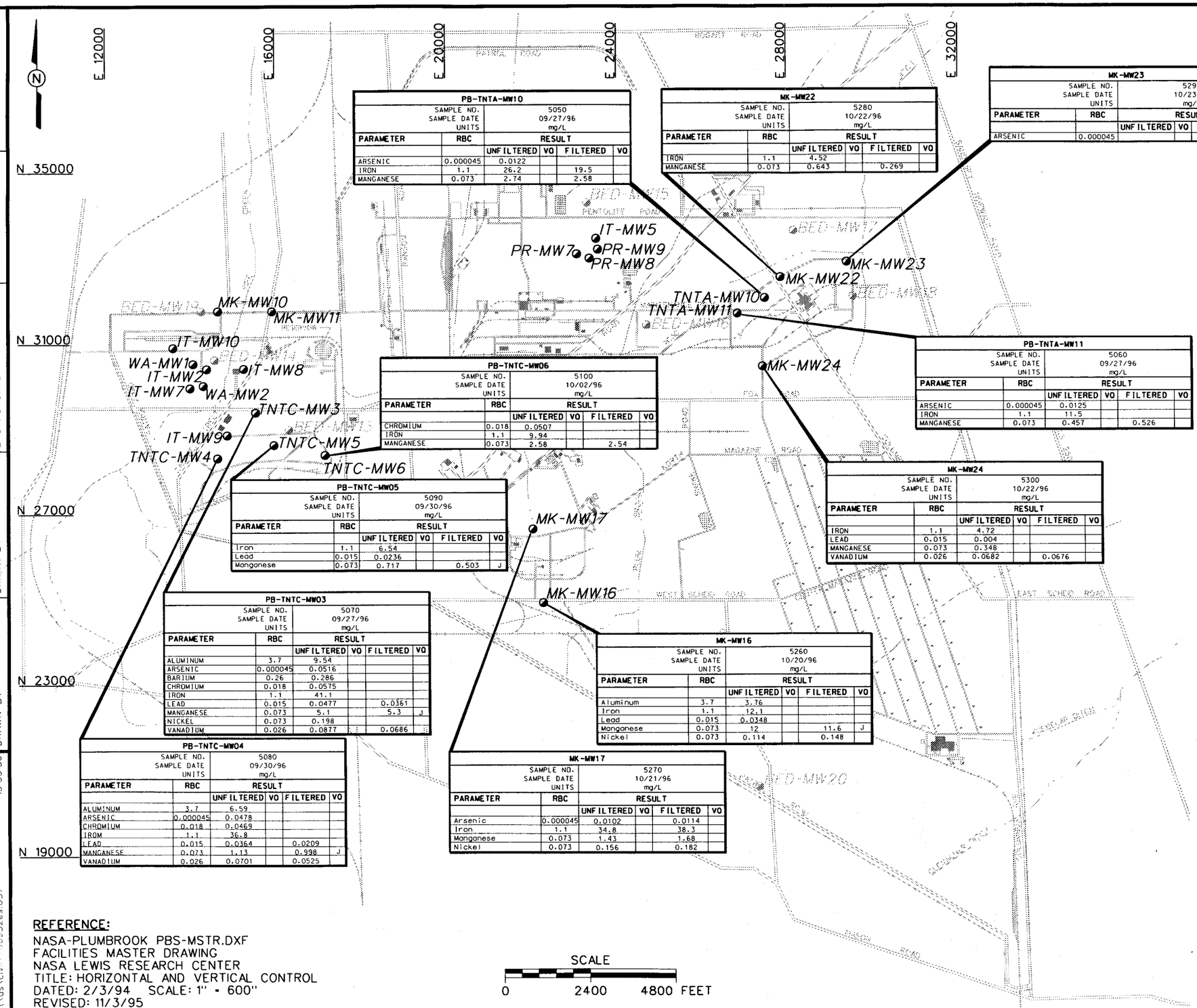
SCALE
0 2400 4800 FEET

FIGURE 4-3
DETECTED ORGANIC COMPOUNDS ABOVE RBCs IN OVERBURDEN WELLS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DWG. NO.: 766952es.036 | PROJ. NO.: 766952
INITIATOR: G. YU | PROJ. MGR.: D. BURTON
DRAFT. CHCK. BY: R. KNIGHT | ENGR. CHCK. BY: G. YU
DATE LAST | DRAWN BY:
STARTING DATE: 3/31/97 | DRAWN BY: R. KNIGHT
23 SEP 97 15:51:56
rvanderg c:\it\as\civil\766952es.036



PB-TNTA-MW10

SAMPLE NO.		5050			
SAMPLE DATE		09/27/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ARSENIC	0.000045	0.0122			
IRON	1.1	26.2		19.5	
MANGANESE	0.073	2.74		2.58	

MK-MW22

SAMPLE NO.		5280			
SAMPLE DATE		10/22/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
IRON	1.1	4.52			
MANGANESE	0.073	0.643		0.269	

MK-MW23

SAMPLE NO.		5290			
SAMPLE DATE		10/23/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ARSENIC	0.000045			0.0104	

PB-TNTA-MW11

SAMPLE NO.		5060			
SAMPLE DATE		09/27/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ARSENIC	0.000045	0.0125			
IRON	1.1	11.5			
MANGANESE	0.073	0.457		0.526	

PB-TNTC-MW06

SAMPLE NO.		5100			
SAMPLE DATE		10/02/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
CHROMIUM	0.018	0.0507			
IRON	1.1	9.94			
MANGANESE	0.073	2.58		2.54	

MK-MW24

SAMPLE NO.		5300			
SAMPLE DATE		10/22/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
IRON	1.1	4.72			
LEAD	0.015	0.004			
MANGANESE	0.073	0.348			
VANADIUM	0.026	0.0682		0.0676	

PB-TNTC-MW05

SAMPLE NO.		5090			
SAMPLE DATE		09/30/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
Iron	1.1	6.54			
Lead	0.015	0.0236			
Manganese	0.073	0.717		0.503	J

PB-TNTC-MW03

SAMPLE NO.		5070			
SAMPLE DATE		09/27/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ALUMINUM	3.7	9.54			
ARSENIC	0.000045	0.0516			
BARIUM	0.26	0.286			
CHROMIUM	0.018	0.0575			
IRON	1.1	41.1			
LEAD	0.015	0.0477		0.0361	
MANGANESE	0.073	5.1		5.3	J
NICKEL	0.073	0.198			
VANADIUM	0.026	0.0877		0.0686	

MK-MW16

SAMPLE NO.		5260			
SAMPLE DATE		10/20/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
Aluminum	3.7	3.76			
Iron	1.1	12.1			
Lead	0.015	0.0348			
Manganese	0.073	12		11.6	J
Nickel	0.073	0.114		0.148	

PB-TNTC-MW04

SAMPLE NO.		5080			
SAMPLE DATE		09/30/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ALUMINUM	3.7	6.59			
ARSENIC	0.000045	0.0478			
CHROMIUM	0.018	0.0469			
IRON	1.1	36.8			
LEAD	0.015	0.0364		0.0209	
MANGANESE	0.073	1.13		0.998	J
VANADIUM	0.026	0.0701		0.0525	

MK-MW17

SAMPLE NO.		5270			
SAMPLE DATE		10/21/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
Arsenic	0.000045	0.0102		0.0114	
Iron	1.1	34.8		38.3	
Manganese	0.073	1.43		1.68	
Nickel	0.073	0.156		0.182	

REFERENCE:
NASA-PLUMBROOK PBS-MSTR.DXF
FACILITIES MASTER DRAWING
NASA LEWIS RESEARCH CENTER
TITLE: HORIZONTAL AND VERTICAL CONTROL
DATED: 2/3/94 SCALE: 1" = 600"
REVISED: 11/3/95

FIGURE 4-4
DETECTED INORGANIC ANALYTES ABOVE RBCs, OVERBURDEN WELLS TNT MANUFACTURING AREAS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: R. KNIGHT | ENGR. CHCK. BY: G. YU | DWG. NO.: \\...\766952es.037
INITIATOR: G. YU | PROJ. MGR.: D. BURTON | PROJ. NO.: 766952
STARTING DATE: 3/31/97 | DATE LAST
DRAWN BY: R. KNIGHT | DRAWN BY:
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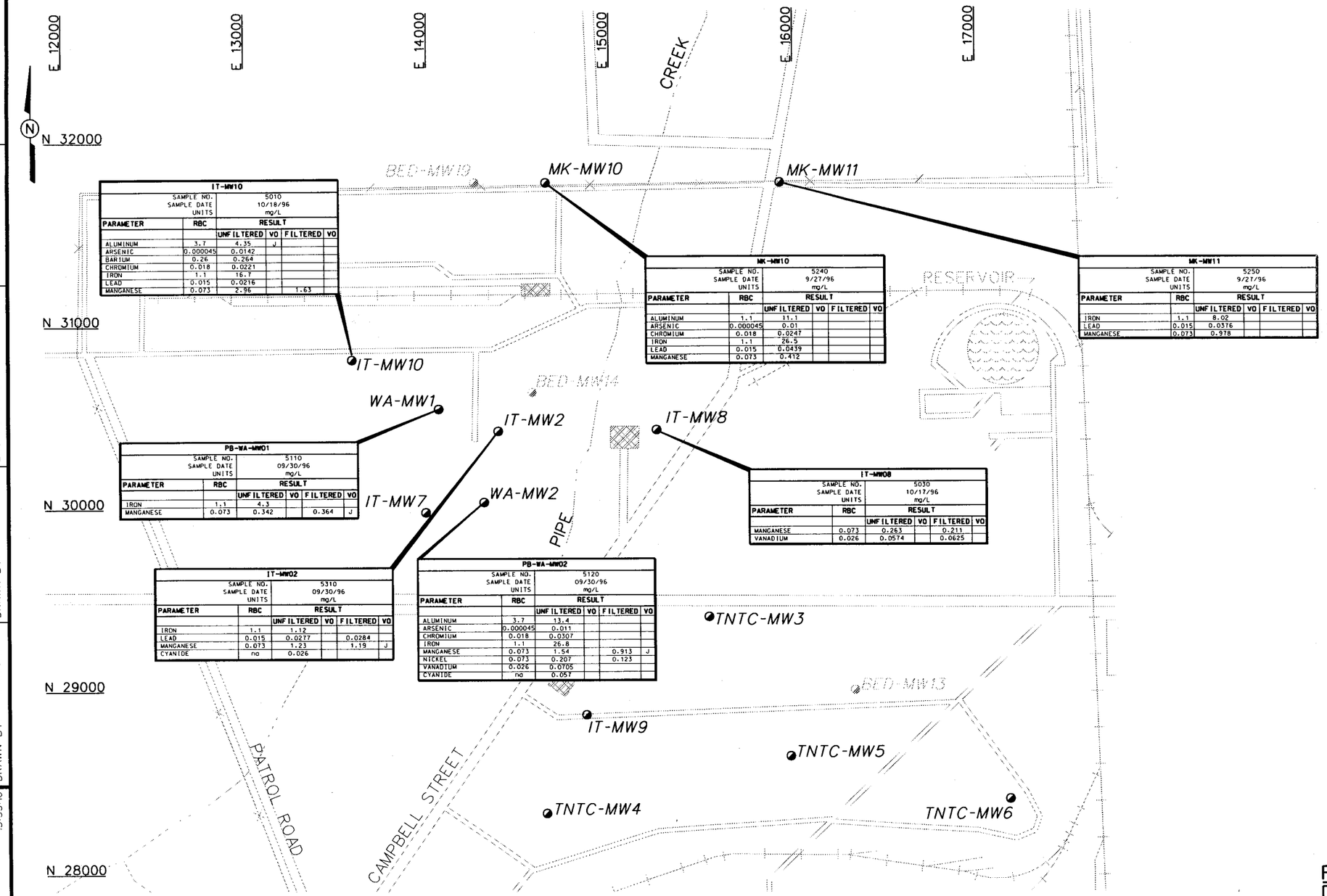

IT-MW10

SAMPLE NO.		5010			
SAMPLE DATE		10/18/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ALUMINUM	3.7	4.35	J		
ARSENIC	0.000045	0.0142			
BARIUM	0.26	0.264			
CHROMIUM	0.018	0.0221			
IRON	1.1	16.7			
LEAD	0.015	0.0216			
MANGANESE	0.073	2.96		1.63	

MK-MW10

SAMPLE NO.		5240			
SAMPLE DATE		9/27/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ALUMINUM	1.1	11.1			
ARSENIC	0.000045	0.01			
CHROMIUM	0.018	0.0247			
IRON	1.1	26.5			
LEAD	0.015	0.0439			
MANGANESE	0.073	0.412			

MK-MW11

SAMPLE NO.		5250			
SAMPLE DATE		9/27/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
IRON	1.1	8.02			
LEAD	0.015	0.0376			
MANGANESE	0.073	0.978			

PB-WA-MW01

SAMPLE NO.		5110			
SAMPLE DATE		09/30/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
IRON	1.1	4.3			
MANGANESE	0.073	0.342		0.364	J

IT-MW08

SAMPLE NO.		5030			
SAMPLE DATE		10/17/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
MANGANESE	0.073	0.263		0.211	
VANADIUM	0.026	0.0574		0.0625	

IT-MW02

SAMPLE NO.		5310			
SAMPLE DATE		09/30/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
IRON	1.1	1.12			
LEAD	0.015	0.0277		0.0284	
MANGANESE	0.073	1.23		1.19	J
CYANIDE	na	0.026			

PB-WA-MW02

SAMPLE NO.		5120			
SAMPLE DATE		09/30/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ALUMINUM	3.7	13.4			
ARSENIC	0.000045	0.011			
CHROMIUM	0.018	0.0307			
IRON	1.1	26.8			
MANGANESE	0.073	1.54		0.913	J
NICKEL	0.073	0.207		0.123	
VANADIUM	0.026	0.0705			
CYANIDE	na	0.057			

LEGEND:

- BUILDINGS
- FENCE (PBOW BOUNDARY)
- RAILROAD
- DITCH
- SURFACE POND
- EXISTING WELL

REFERENCE:

NASA-PLUMBROOK PBS-MSTR.DXF
FACILITIES MASTER DRAWING
NASA LEWIS RESEARCH CENTER
TITLE: HORIZONTAL AND VERTICAL CONTROL
DATED: 2/3/94 SCALE: 1" = 600"
REVISED: 11/3/95

SCALE
0 600 1200 FEET

FIGURE 4-5
DETECTED INORGANIC ANALYTES ABOVE RBCs IN WEST AREA REDWATER PONDS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DWG. NO.: 766952es.038
PROJ. NO.: 766952
INITIATOR: G. YU
PROJ. MGR.: D. BURTON
DRAFT. CHCK. BY: R. KNIGHT
ENGR. CHCK. BY: G. YU
DATE LAST
DRAWN BY:
STARTING DATE: 4/1/97
DRAWN BY: R. KNIGHT
23 SEP 97
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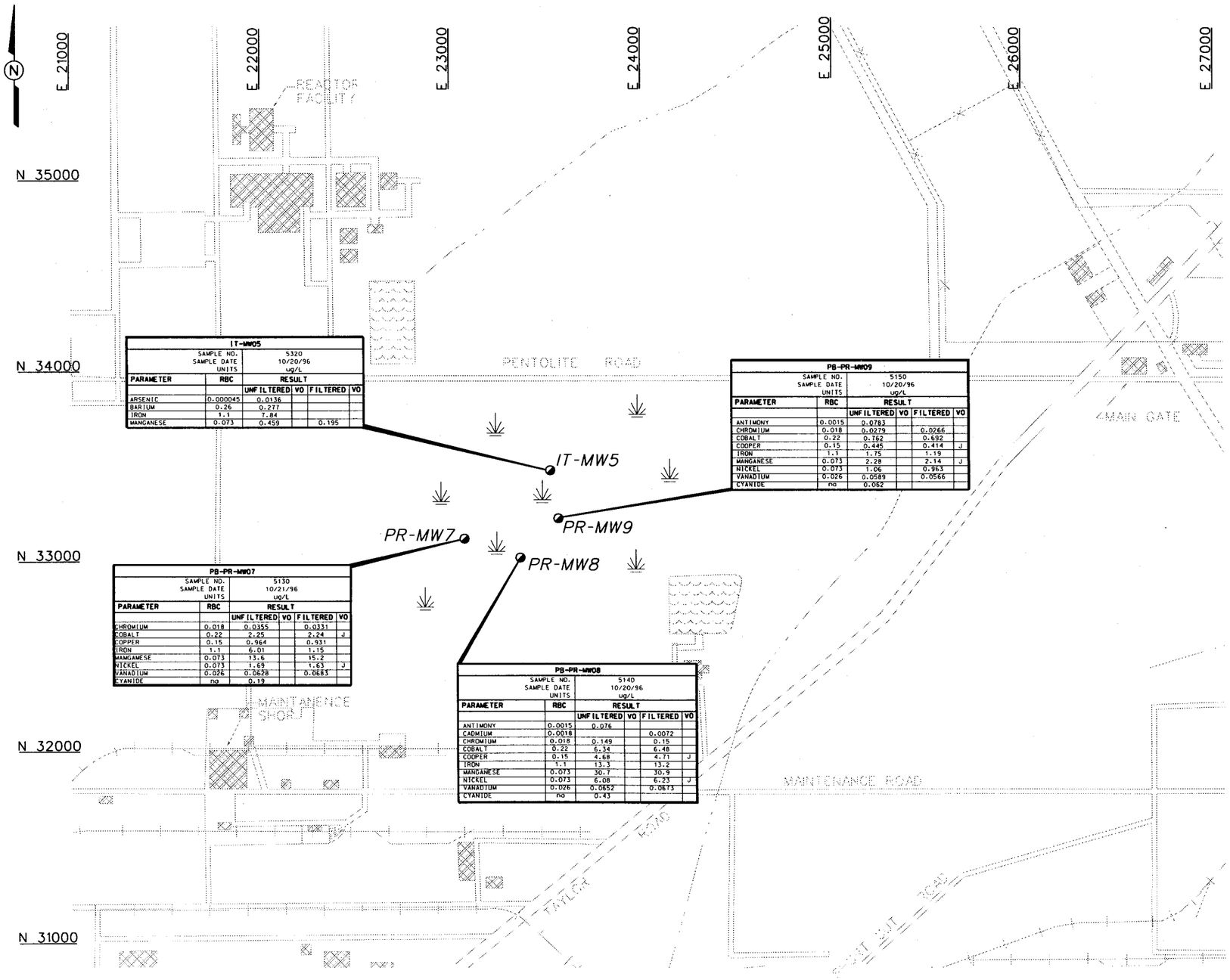

IT-MW05					
SAMPLE NO.		5320			
SAMPLE DATE		10/20/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ARSENIC	0.000045	0.0136			
BARIUM	0.26	0.277			
IRON	1.1	7.84			
MANGANESE	0.073	0.459		0.195	

PB-PR-MW09					
SAMPLE NO.		5150			
SAMPLE DATE		10/20/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ANTIMONY	0.0015	0.0783			
CHROMIUM	0.018	0.0279		0.0266	
COBALT	0.22	0.762		0.692	
COOPER	0.15	0.445		0.414	J
IRON	1.1	1.75		1.19	
MANGANESE	0.073	2.28		2.14	J
NICKEL	0.073	1.06		0.963	
VANADIUM	0.026	0.0589		0.0566	
CYANIDE	no	0.062			

PB-PR-MW07					
SAMPLE NO.		5130			
SAMPLE DATE		10/21/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
CHROMIUM	0.018	0.0355		0.0331	
COBALT	0.22	2.25		2.24	J
COPPER	0.15	0.964		0.931	
IRON	1.1	6.01		1.15	
MANGANESE	0.073	13.6		15.2	
NICKEL	0.073	1.69		1.63	J
VANADIUM	0.026	0.0628		0.0683	
CYANIDE	no	0.19			

PB-PR-MW08					
SAMPLE NO.		5140			
SAMPLE DATE		10/20/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ANTIMONY	0.0015	0.076			
CADMIUM	0.0018			0.0072	
CHROMIUM	0.018	0.149		0.15	
COBALT	0.22	6.34		6.48	
COOPER	0.15	4.68		4.71	J
IRON	1.1	13.3		13.2	
MANGANESE	0.073	30.7		30.9	
NICKEL	0.073	6.08		6.23	J
VANADIUM	0.026	0.0652		0.0673	
CYANIDE	no	0.43			

LEGEND:

- BUILDINGS
- FENCE (PBOW BOUNDARY)
- RAILROAD
- DITCH
- SURFACE POND
- EXISTING WELL
- POND AREA

REFERENCE:
NASA-PLUMBROOK PBS-MSTR.DXF
FACILITIES MASTER DRAWING
NASA LEWIS RESEARCH CENTER
TITLE: HORIZONTAL AND VERTICAL CONTROL
DATED: 2/3/94 SCALE: 1" = 600'
REVISED: 11/3/95

SCALE
0 600 1200 FEET

FIGURE 4-6
DETECTED INORGANIC ANALYTES ABOVE RBCs IN PENTOLITE ROAD REDWATER POND

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: R. KNIGHT | INITIATOR: G. YU | DWG. NO.: ...752es.039
ENGR. CHCK. BY: G. YU | PROJ. MGR.: D. BURTON | PROJ. NO.: 766952
STARTING DATE: 4/1/97 | DATE LAST
DRAWN BY: R. KNIGHT | DRAWN BY:
23 SEP 97 15:56:45
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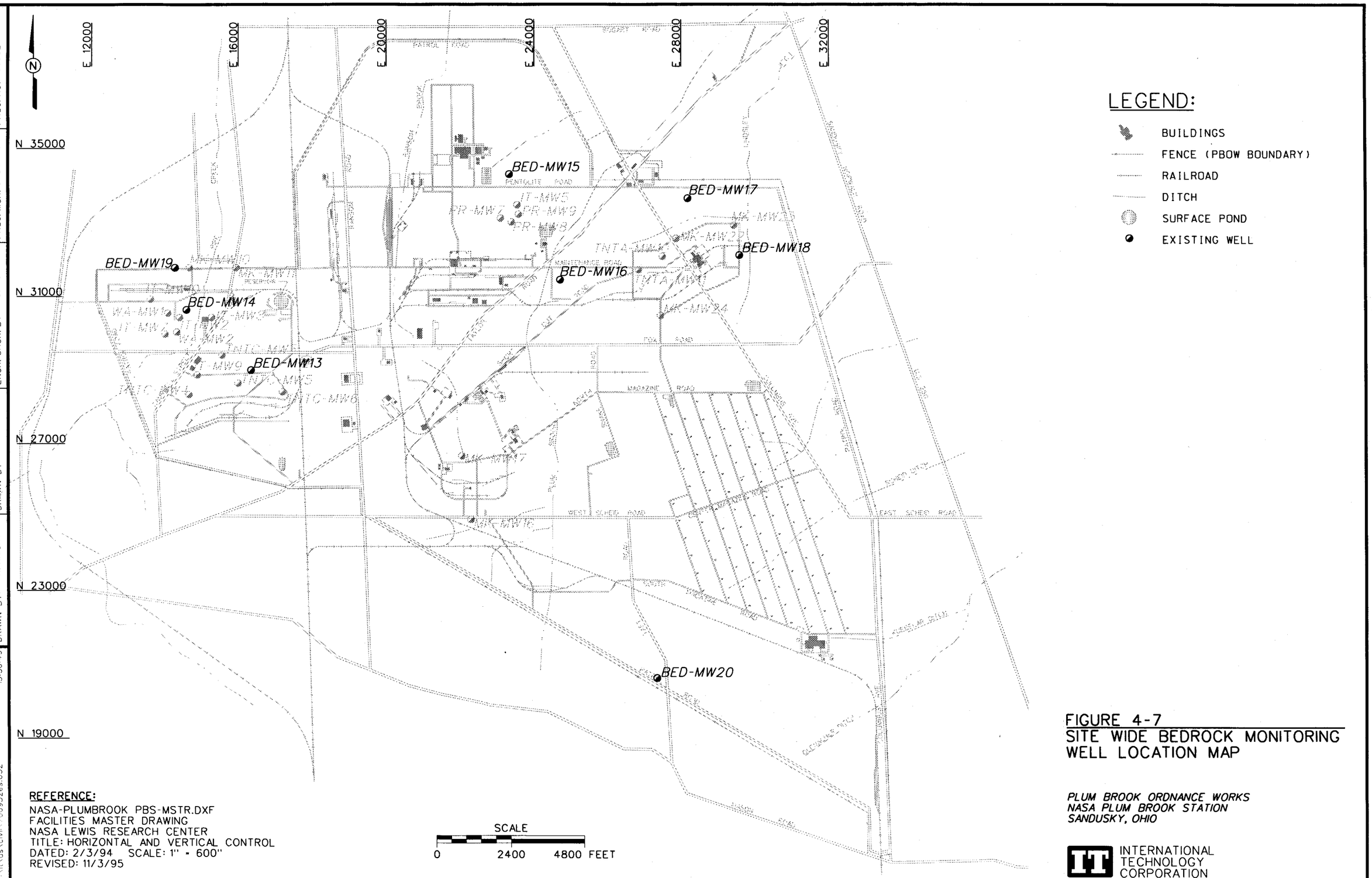

FIGURE 4-7
SITE WIDE BEDROCK MONITORING WELL LOCATION MAP

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

DWG. NO.:	PROJ. NO.: 766952
INITIATOR: G. YU	PROJ. MGR.: D. BURTON
DRAFT. CHCK. BY: R. KNIGHT	ENGR. CHCK. BY: G. YU
DATE LAST	DRAWN BY:
STARTING DATE: 3/13/97	
DRAWN BY: R. KNIGHT	

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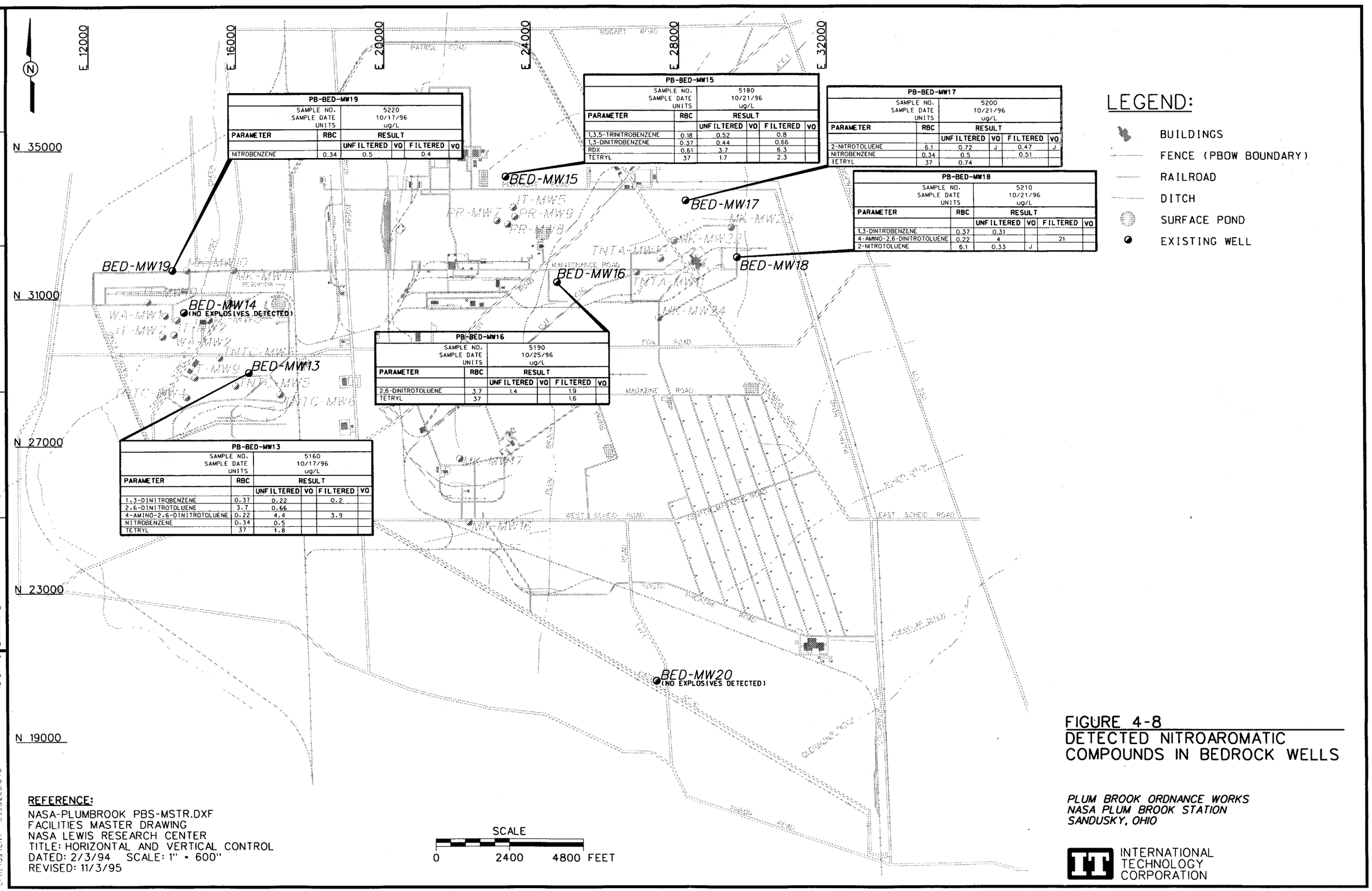


PB-BED-MW19

	SAMPLE NO.	5220			
	SAMPLE DATE	10/17/96			
	UNITS	ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
NITROBENZENE	0.34	0.5		0.4	

PB-BED-MW15

	SAMPLE NO.	5180			
	SAMPLE DATE	10/21/96			
	UNITS	ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
1,3,5-TRINITROBENZENE	0.18	0.52		0.8	
1,3-DINITROBENZENE	0.37	0.44		0.66	
RDX	0.61	3.7		6.3	
TETRYL	37	1.7		2.3	

PB-BED-MW17

	SAMPLE NO.	5200			
	SAMPLE DATE	10/21/96			
	UNITS	ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
2-NITROTOLUENE	6.1	0.72	J	0.47	J
NITROBENZENE	0.34	0.5		0.51	
TETRYL	37	0.74			

PB-BED-MW18

	SAMPLE NO.	5210			
	SAMPLE DATE	10/21/96			
	UNITS	ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
1,3-DINTROBENZENE	0.37	0.31			
4-AMINO-2,6-DINITROTOLUENE	0.22	4		21	
2-NITROTOLUENE	6.1	0.33	J		

PB-BED-MW16

	SAMPLE NO.	5190			
	SAMPLE DATE	10/25/96			
	UNITS	ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
2,6-DINITROTOLUENE	3.7	1.4		1.9	
TETRYL	37			1.6	

PB-BED-MW13

	SAMPLE NO.	5160			
	SAMPLE DATE	10/17/96			
	UNITS	ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
1,3-DINITROBENZENE	0.37	0.22		0.2	
2,6-DINITROTOLUENE	3.7	0.66			
4-AMINO-2,6-DINITROTOLUENE	0.22	4.4		3.9	
NITROBENZENE	0.34	0.5			
TETRYL	37	1.8			

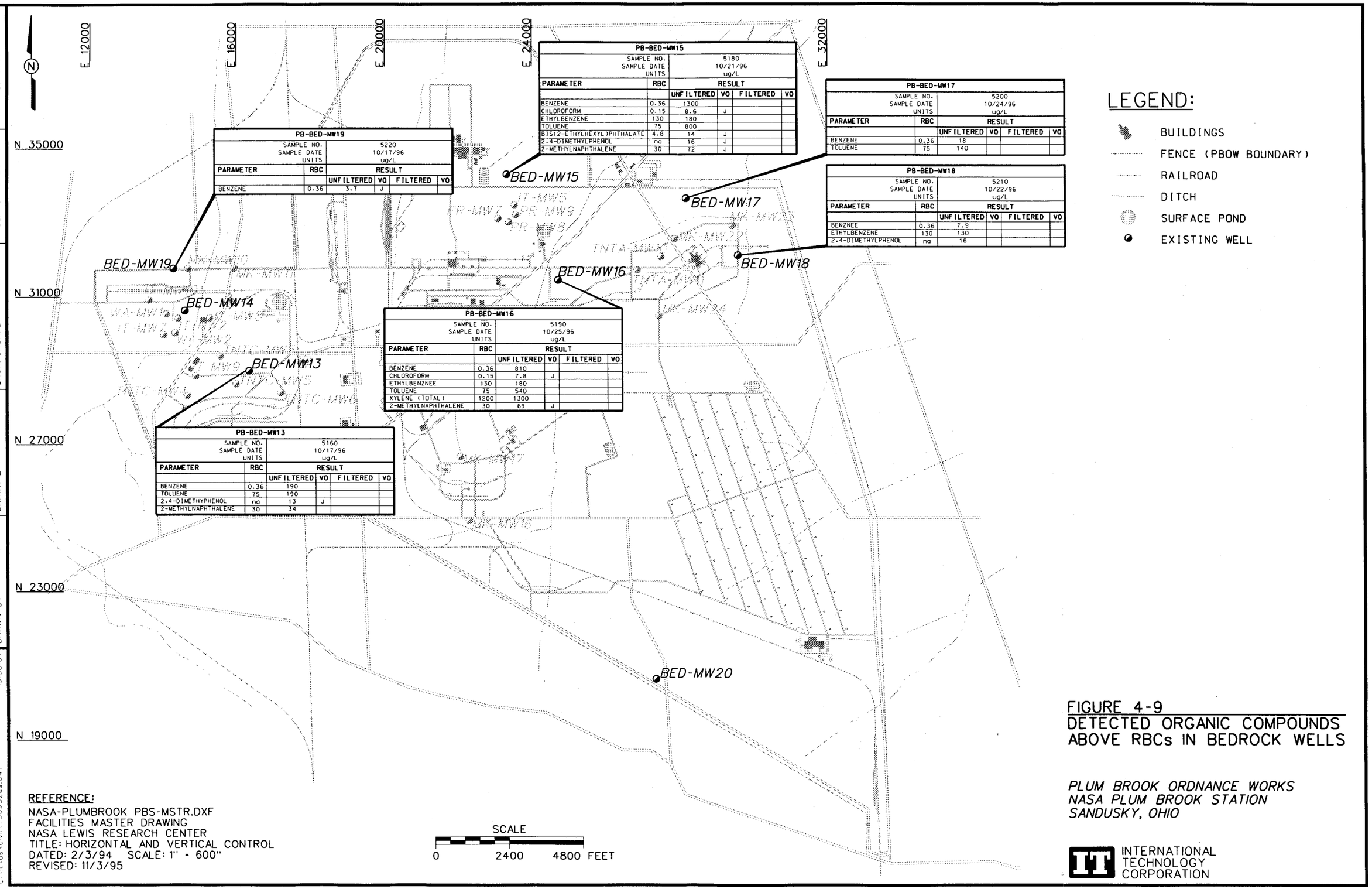
REFERENCE:
NASA-PLUMBROOK PBS-MSTR.DXF
FACILITIES MASTER DRAWING
NASA LEWIS RESEARCH CENTER
TITLE: HORIZONTAL AND VERTICAL CONTROL
DATED: 2/3/94 SCALE: 1" = 600"
REVISED: 11/3/95

FIGURE 4-8
DETECTED NITROAROMATIC COMPOUNDS IN BEDROCK WELLS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DWG. NO.: [illegible] 752es.040
PROJ. NO.: 766952
INITIATOR: G. YU
PROJ. MGR.: D. BURTON
DRAFT. CHCK. BY: R. KNIGHT
ENGR. CHCK. BY: G. YU
DATE LAST
DRAWN BY:
STARTING DATE: 4/1/97
DRAWN BY: R. KNIGHT
23 SEP 97
15:57:46
rvanderg
c:\it\ds\civil\766952es.040



PB-BED-MW15

SAMPLE NO.		5180			
SAMPLE DATE		10/21/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
BENZENE	0.36	1300			
CHLOROFORM	0.15	8.6	J		
ETHYLBENZENE	130	180			
TOLUENE	75	800			
BIS(2-ETHYLHEXYL)PHTHALATE	4.8	14	J		
2,4-DIMETHYLPHENOL	na	16	J		
2-METHYLNAPHTHALENE	30	72	J		

PB-BED-MW17

SAMPLE NO.		5200			
SAMPLE DATE		10/24/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
BENZENE	0.36	18			
TOLUENE	75	140			

PB-BED-MW18

SAMPLE NO.		5210			
SAMPLE DATE		10/22/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
BENZNEE	0.36	7.9			
ETHYLBENZENE	130	130			
2,4-DIMETHYLPHENOL	na	16			

PB-BED-MW19

SAMPLE NO.		5220			
SAMPLE DATE		10/17/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
BENZENE	0.36	3.7	J		

PB-BED-MW16

SAMPLE NO.		5190			
SAMPLE DATE		10/25/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
BENZENE	0.36	810			
CHLOROFORM	0.15	7.8	J		
ETHYLBENZNEE	130	180			
TOLUENE	75	540			
XYLENE (TOTAL)	1200	1300			
2-METHYLNAPHTHALENE	30	69	J		

PB-BED-MW13

SAMPLE NO.		5160			
SAMPLE DATE		10/17/96			
UNITS		ug/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
BENZENE	0.36	190			
TOLUENE	75	190			
2,4-DIMETHYPHENOL	na	13	J		
2-METHYLNAPHTHALENE	30	34			

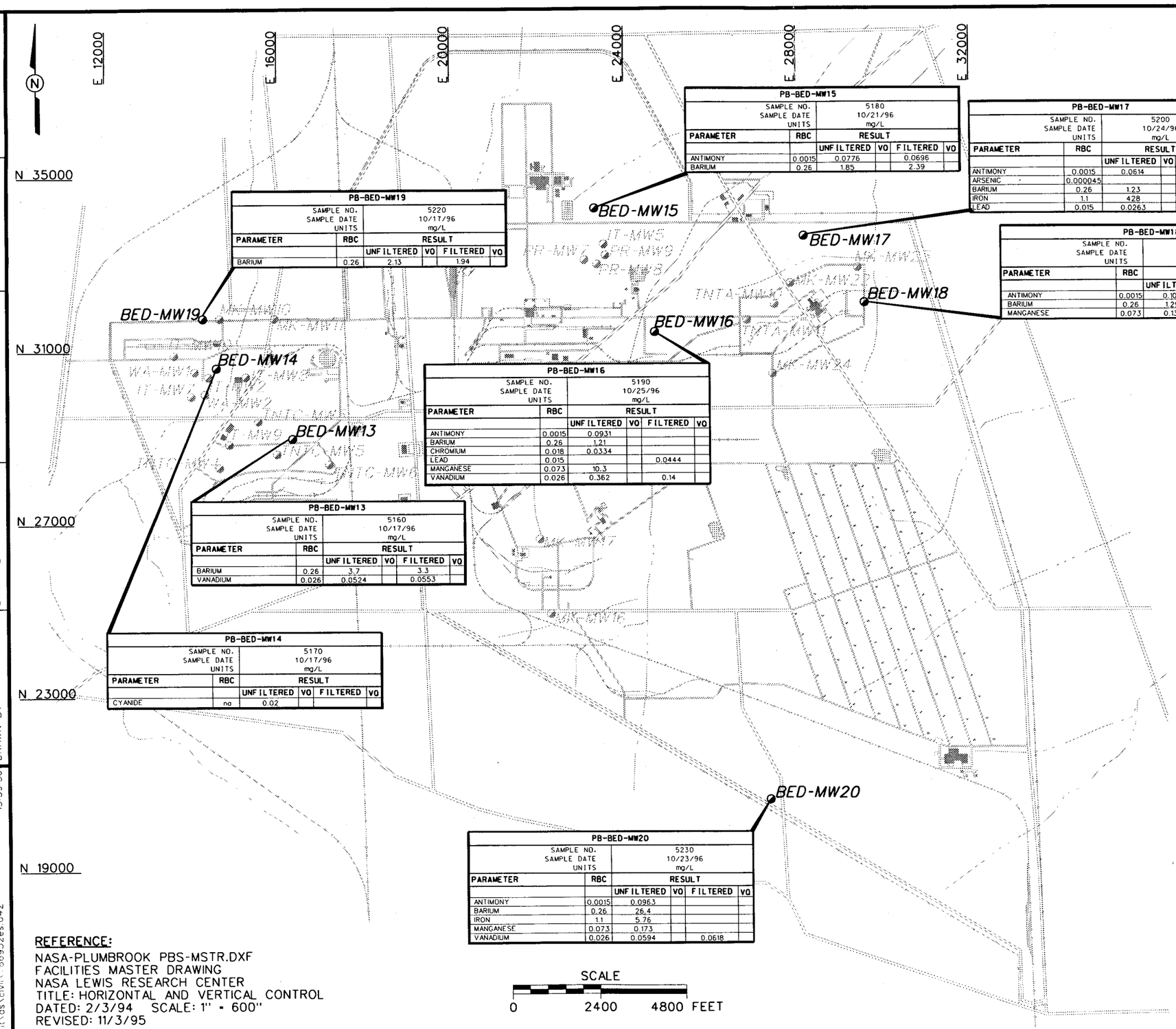
REFERENCE:
NASA-PLUMBROOK PBS-MSTR.DXF
FACILITIES MASTER DRAWING
NASA LEWIS RESEARCH CENTER
TITLE: HORIZONTAL AND VERTICAL CONTROL
DATED: 2/3/94 SCALE: 1" = 600"
REVISED: 11/3/95

FIGURE 4-9
DETECTED ORGANIC COMPOUNDS ABOVE RBCs IN BEDROCK WELLS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DWG. NO.: 766952es.041
PROJ. NO.: 766952
INITIATOR: G. YU
PROJ. MGR.: D. BURTON
DRAFT. CHCK. BY: R. KNIGHT
ENGR. CHCK. BY: G. YU
DATE LAST
DRAWN BY:
STARTING DATE: 4/1/97
DRAWN BY: R. KNIGHT
23 SEP 97
15:58:57
rvanderg
c:\it\ds\cvik766952es.041



PB-BED-MW15

SAMPLE NO.		5180			
SAMPLE DATE		10/21/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ANTIMONY	0.0015	0.0776		0.0696	
BARIUM	0.26	1.85		2.39	

PB-BED-MW17

SAMPLE NO.		5200			
SAMPLE DATE		10/24/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ANTIMONY	0.0015	0.0614			
ARSENIC	0.000045			0.0111	
BARIUM	0.26	1.23			
IRON	1.1	428			
LEAD	0.015	0.0263			

PB-BED-MW18

SAMPLE NO.		5210			
SAMPLE DATE		10/22/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ANTIMONY	0.0015	0.109			
BARIUM	0.26	1.29			
MANGANESE	0.073	0.131			

PB-BED-MW19

SAMPLE NO.		5220			
SAMPLE DATE		10/17/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
BARIUM	0.26	2.13		1.94	

PB-BED-MW16

SAMPLE NO.		5190			
SAMPLE DATE		10/25/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ANTIMONY	0.0015	0.0931			
BARIUM	0.26	1.21			
CHROMIUM	0.018	0.0334			
LEAD	0.015			0.0444	
MANGANESE	0.073	10.3			
VANADIUM	0.026	0.362		0.14	

PB-BED-MW13

SAMPLE NO.		5160			
SAMPLE DATE		10/17/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
BARIUM	0.26	3.7		3.3	
VANADIUM	0.026	0.0524		0.0553	

PB-BED-MW14

SAMPLE NO.		5170			
SAMPLE DATE		10/17/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
CYANIDE	na	0.02			

PB-BED-MW20

SAMPLE NO.		5230			
SAMPLE DATE		10/23/96			
UNITS		mg/L			
PARAMETER	RBC	RESULT			
		UNFILTERED	VO	FILTERED	VO
ANTIMONY	0.0015	0.0963			
BARIUM	0.26	26.4			
IRON	1.1	5.76			
MANGANESE	0.073	0.173			
VANADIUM	0.026	0.0594		0.0618	

LEGEND:

- BUILDINGS
- FENCE (PBOW BOUNDARY)
- RAILROAD
- DITCH
- SURFACE POND
- EXISTING WELL

REFERENCE:

NASA-PLUMBROOK PBS-MSTR.DXF
FACILITIES MASTER DRAWING
NASA LEWIS RESEARCH CENTER
TITLE: HORIZONTAL AND VERTICAL CONTROL
DATED: 2/3/94 SCALE: 1" = 600"
REVISED: 11/3/95

SCALE
0 2400 4800 FEET

FIGURE 4-10
DETECTED INORGANIC ANALYTES ABOVE RBCs IN BEDROCK WELLS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: R. KNIGHT | INITIATOR: G. YU | DWG. NO.: 52es.042
ENGR. CHCK. BY: G. YU | PROJ. MGR.: D. BURTON | PROJ. NO.: 766952
STARTING DATE: 4/1/97 | DATE LAST
DRAWN BY: R. KNIGHT | DRAWN BY:
23 SEP 97 15:59:56
rvonderg
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Seven total metals (aluminum, arsenic, barium, chromium, iron, lead, and manganese) exceeded the respective RBCs in IT-MW06, while only manganese exceeded the RBC in the dissolved phase in this well. This is indicative that, with the exception of manganese, the RBC exceedances of these inorganic compounds are due to suspended solids in the groundwater sample.

Only two metals (both total and dissolved) exceeded the RBCs in IT-MW08; total and dissolved manganese (263 and 211 µg/L, respectively) and total and dissolved vanadium (57.4 and 62.5 µg/L, respectively) exceeded the RBCs.

Two total metals (iron at 4,300 and manganese at 342 µg/L) exceeded the RBCs in WA-MW01. In the dissolved phase, only manganese (364 µg/L) exceeded the RBC in this well.

Overburden well WA-MW02 exhibited seven total metals (aluminum, arsenic, chromium, iron, manganese, nickel, and vanadium) and two dissolved metals (manganese and nickel) at concentrations exceeding the RBCs. Similar to the analytical results from IT-MW06, results from WA-MW02 indicate that, with the exception of manganese and nickel, these RBC exceedances are due to suspended solids in the unfiltered groundwater sample.

Monitoring wells MK-MW10 and MK-MW11 both exhibited total metals at concentrations exceeding the RBCs, but dissolved metals did not exceed any of the established RBCs. In MK-MW10, total aluminum, arsenic, chromium, iron, lead, and manganese exceeded the RBCs. A smaller set of metals exceeded the RBCs in the unfiltered (total) sample from MK-MW11, including iron, lead, and manganese. Because dissolved metals were detected at concentrations below the RBCs, the RBC exceedances of total metals from these two wells are attributable to suspended solids in the groundwater samples.

Of the four overburden wells located in TNTC, two (TNTC-MW03 and TNTC-MW04) exhibited the largest suites of metals at concentrations exceeding the RBCs. Total aluminum, arsenic, chromium, iron, lead, manganese, and vanadium exceeded the RBCs in each of these wells. In addition, total barium and nickel also exceeded the RBCs in TNTC-MW03. In the dissolved phase, only lead, manganese, and vanadium exceeded the RBCs in the two wells, indicating that the RBC exceedances for most of the total metals were due to suspended solids in the groundwater samples.

4.1.1 Overburden Wells

4.1.1.1 Volatile Organic Compounds

Of the 11 sampled overburden wells, only two wells (TNTC-MW03 and MK-MW10) exhibited detectable levels of VOCs (Table 4-1, Figure 4-2). However, none of the detected VOCs were present at levels exceeding the RBCs.

4.1.1.2 Semivolatile Organic Compounds

Three overburden monitoring wells (IT-MW02, WA-MW02, and TNTC-MW03), exhibited detectable levels of SVOCs (Table 4-1, Figure 4-2). Of these three wells, IT-MW02 and WA-MW02 had levels of SVOCs that exceeded the respective RBCs; both of these wells are located central portion of the WARWP. In IT-MW02, three nitroaromatic compounds (2,4-DNT at 110 micrograms per liter [µg/L], 2,6-DNT at 16 µg/L, and 4,6-dinitro-2-methylphenol at 60 µg/L) exceeded the RBCs under the SVOC analysis, and two nitroaromatic compounds (2,4-DNT at 30 µg/L and 3-nitroaniline at 110 µg/L) exceeded the RBCs in WA-MW02.

4.1.1.3 Nitroaromatic Compounds

Of the 11 overburden monitoring wells, IT-MW02, IT-MW06, and WA-MW02 had detectable levels of nitroaromatic compounds during the GWI (Table 4-2, Figure 4-3). Of these, only IT-MW02 and WA-MW02 exhibited nitroaromatic compounds at concentrations greater than the RBCs. In IT-MW02, 1,3,5-TNB (9.7 µg/L), 1,3-DNB (12 µg/L), 2,4-DNT (20 µg/L), and royal demolition explosive (RDX) (11 µg/L) exceeded the respective RBCs under the nitroaromatic analysis. A larger set of nitroaromatic compounds exceeded the RBCs in WA-MW02, and included 1,3,5-TNB (11 µg/L), 1,3-DNB (18 µg/L), 2,4,6-TNT (2.4 µg/L), 2,4-DNT (12 µg/L), and 4-amino-2,6-DNT (1.1 µg/L). Both of these wells also had detected levels of nitroaromatics exceeding the RBCs under the SVOC analysis.

4.1.1.4 Pesticides and PCBs

Pesticides and PCBs were not detected in any of the 11 overburden wells sampled during the GWI in the WARWP and TNTC (Table 4-2).

4.1.1.5 Inorganic Compounds

Each of the 11 overburden wells exhibited at least one total inorganic compound at a concentration exceeding the RBCs (Table 4-3, Figures 4-4 and 4-5). In IT-MW02, total iron (1,120 µg/L), lead (27.7 µg/L), and manganese (1,230 µg/L) exceeded the RBCs. In the dissolved phase, lead (28.4 µg/L) and manganese (1,190 µg/L) exceeded the RBCs in this well.

Detected total metals in TNTC-MW05 that exceeded the RBCs were limited to iron (6,540 µg/L), lead (23.6 µg/L), and manganese (717 µg/L), while only one dissolved metal exceeded the RBC (manganese at 503 µg/L). Similarly, three total metals (chromium at 50.7 µg/L, iron at 9,940 µg/L, and manganese at 2,580 µg/L) and one dissolved metal (manganese at 2,540 µg/L) exceeded the RBCs in TNTC-MW06. These results indicate that the total chromium (TNTC-MW06), iron (both wells), and lead (TNTC-MW05) RBC exceedances are due to suspended solids in the unfiltered samples.

4.1.1.6 Total Cyanide

Of the 11 overburden monitoring wells, only IT-MW02 and WA-MW02 had detectable levels of cyanide during the GWI, at concentrations of 26 and 57 µg/L, respectively (Table 4-3, Figure 4-4 and 4-5). The RBC value has not been established for cyanide.

4.1.2 Bedrock Wells

4.1.2.1 Volatile Organic Compounds

Each of the three sampled bedrock wells exhibited detectable levels of VOCs (Table 4-4, Figure 4-8). Concentrations of benzene in BED-MW13 (190 µg/L) and BED-MW19 (3.7 µg/l) exceeded the RBC criteria. All three bedrock wells (BED-MW13, BED-MW14 and BED-MW19) exhibited detectable levels of toluene and total xylenes, but only toluene exceeded the RBC in BED-MW13. Monitoring wells BED-MW13 and BED-MW19 had detectable concentrations of ethyl benzene below the RBC limits.

4.1.2.2 Semivolatile Organic Compounds

All three of the sampled bedrock wells exhibited detectable levels of SVOCs (Table 4-4, Figure 4-8). Of these three wells, only BED-MW13 exhibited an SVOC compound (2-methylnaphthalene at 34 µg/L) that exceeded the RBC. Both BED-MW13 and BED-MW19 displayed detectable concentrations of naphthalenes below their respective RBC values. bis(2-Ethylhexyl)phthalate and 2,4-DNT were detected at concentrations below the RBCs in BED-MW14.

4.1.2.3 Nitroaromatic Compounds

Two of the three bedrock monitoring wells, BED-MW13 and BED-MW19, exhibited detectable concentrations of nitroaromatic compounds (Table 4-5, Figure 4-9). Monitoring well BED-MW13 exhibited levels of 4-amino-2,6-DNT that exceeded the RBC in both the total (4.4 µg/L) and the dissolved (3.9 µg/L) phase. In the total phase, both wells displayed a nitrobenzene

concentration of 0.5 µg/L, while in the dissolved phase only BED-MW19 displayed a concentration of 0.4 µg/L. These levels exceed their respective RBCs.

4.1.2.4 Pesticides and PCBs

Pesticides and PCBs were not detected in any of the three bedrock wells sampled during the GWI in the WARWP and TNTC (Table 4-5).

4.1.2.5 Inorganic Compounds

Of the three bedrock wells exhibiting detectable concentrations of total and dissolved inorganic compounds, only BED-MW13 and BED-MW19 had levels exceeding their respective RBCs (Table 4-6, Figure 4-10). Each of the three bedrock wells displayed total and dissolved concentrations of manganese below the established RBC. In addition, all three wells displayed total concentrations of chromium below the RBC, while dissolved chromium was detected only in BED-MW13 and BED-MW14.

In BED-MW13, both barium and vanadium exceeded their RBCs in the total and dissolved phase. Total and dissolved barium concentrations were 3,700 and 3,300 µg/L, respectively, and total and dissolved vanadium concentrations were 52.4 and 55.3 µg/L, respectively. Also observed at this well during field sampling was the strong hydrogen sulfide (H_2S) gas, indicating a possible reducing environment in the bedrock zone.

Monitoring well BED-MW19 exceeded the RBC for total and dissolved barium concentrations at 2,130 and 1,940 µg/L, respectively.

4.1.2.6 Total Cyanide

Of the three bedrock monitoring wells, only BED-MW14 displayed a detectable level of cyanide (20 µg/L) during the GWI (Table 4-6, Figure 4-10). An RBC value has not been established for cyanide.

4.2 Pentolite Road Area

Four overburden and two bedrock wells were sampled in the vicinity of the Pentolite Road Red Water Pond area. These wells are summarized as follows:

- Overburden wells
  - IT-MW05
  - PR-MW07

- PR-MW08
- PR-MW09

- Bedrock wells
  - BED-MW15
  - BED-MW16

The following sections present the analytical results for the four overburden wells, followed by the two bedrock wells.

4.2.1 Overburden Wells

4.2.1.1 Volatile Organic Compounds

Of the four sampled overburden wells, only one well (IT-MW05) exhibited detectable levels of VOCs (Table 4-1, Figure 4-2). The detected concentrations of chlorobenzene (1.3 µg/L) and toluene (1.1 µg/L) were present at levels below the RBCs.

4.2.1.2 Semivolatile Organic Compounds

Three overburden monitoring wells (PR-MW07, PR-MW08, and PR-MW09) exhibited detectable levels of nitroaromatic compounds under the SVOC analysis (Table 4-1, Figure 4-2). Other SVOCs were not detected in any of the overburden wells. In PR-MW08, three nitroaromatic compounds (2,4-DNT at 530, 2,6-DNT at 52, and 4,6-dinitro-2-methylphenol at 870 µg/L, respectively) exceeded the RBCs under the SVOC analysis. In addition, PR-MW08 exhibited 2,4-dinitrophenol at a concentration of 690 µg/L; an RBC has not been developed for this compound. Two nitroaromatic compounds (2,4-DNT at 30 and 2,6-DNT at 6.8 µg/L) exceeded the RBCs in PR-MW09. Monitoring well PR-MW07 exhibited one nitroaromatic compound (2,6-DNT at 70 µg/L) exceeding the RBC criteria.

4.2.1.3 Nitroaromatic Compounds

Two overburden monitoring wells, PR-MW07 and PR-MW08, exhibited total and dissolved levels of 1,3,5-TNB, 1,3-DNB, 2,4-DNT, and RDX exceeding the RBC criteria (Table 4-2, Figure 4-3). In addition, PR-MW07 displayed total and dissolved concentrations of 2,6-DNT and PR-MW08 showed a dissolved level of 2,4,6-TNT, both exceeding their respective RBCs. In contrast, monitoring well PR-MW09 exceeded RBC concentrations for 1,3,5-TNB, 1,3-DNB, and 2,4-DNT in total samples, with nondetectable concentrations in the dissolved samples. Overburden well IT-MW05 did not exhibit detectable concentrations of nitroaromatics.

4.2.1.4 Pesticides and PCBs

Pesticides and PCBs were not detected in any of the four overburden wells sampled during the GWI (Table 4-2).

4.2.1.5 Inorganic Compounds

Three of the four overburden wells, PR-MW07, PR-MW08, and PR-MW09, exceeded the RBC criteria for chromium, cobalt, copper, iron, manganese, nickel, and vanadium in both the total and dissolved phases (Table 4-3, Figure 4-6). In addition, PR-MW07 and PR-MW08 exceeded the RBC for antimony in the total phase. Cadmium exceeded the RBC in the dissolved phase for overburden well PR-MW08. In IT-MW05, manganese concentrations, total and dissolved, surpassed the RBC limit. Arsenic, barium, and iron also exceeded the RBC threshold for IT-MW05 in the total phase.

4.2.1.6 Total Cyanide

Cyanide was detected in PR-MW07 (190 µg/L), PR-MW08 (430 µg/L), and PR-MW09 (620 µg/L), but was not detected in IT-MW05 (Table 4-3, Figure 4-6). An RBC value has not been established for cyanide.

4.2.2 Bedrock Wells

4.2.2.1 Volatile Organic Compounds

Each of the two sampled bedrock wells, BED-MW15 and BED-MW16, exhibited levels of benzene, chloroform, toluene, and ethyl benzene that surpassed the RBC criteria (Table 4-4, Figure 4-8). Additionally, BED-MW15 displayed total xylenes slightly below the RBC level, while BED-MW16 displayed concentrations in excess of the RBC. Petroleum product was observed floating above the water table at BED-MW16.

4.2.2.2 Semivolatile Organic Compounds

Each of the two sampled bedrock wells, BED-MW15 and BED-MW16, exhibited levels of 2-methylnaphthalene (72 and 69 µg/L, respectively) in excess of the RBC (Table 4-4, Figure 4-8). Naphthalenes were also detected in each sample; however, the concentrations were below the RBC levels. Bedrock well BED-MW15 displayed a concentration of bis(2-ethylhexyl)phthalate at 14 µg/L, exceeding the RBC value. Another SVOC (2,4-dimethylphenol) was also detected at BED-MW15 at a concentration of 16 µg/L. However, the RBC has not been established for this compound.

4.2.2.3 Nitroaromatic Compounds

Of the two bedrock monitoring wells, only BED-MW15 displayed nitroaromatic concentrations greater than the RBC values (Table 4-5, Figure 4-9). 1,3,5-TNT, 1,3-DNB, and RDX exceeded the RBCs in the total and dissolved phases of the BED-MW15 groundwater sample. Tetryl was also present, although at levels below the RBC. 2,6-DNT and Tetryl were detected in BED-MW16, but did not exceed the RBCs.

4.2.2.4 Pesticides and PCBs

Pesticides and PCBs were not detected in either of the two bedrock wells sampled during the GWI (Table 4-5).

4.2.2.5 Inorganic Compounds

Both of the bedrock wells exhibited detectable concentrations of total and dissolved inorganic compounds (Table 4-6, Figure 4-10). Bedrock well BED-MW15 exhibited total and dissolved concentrations of antimony (77.6 and 69.6 µg/L, respectively) and barium (1,850 and 2,390 µg/L, respectively) that exceeded the RBC values. Manganese and zinc were also detected in BED-MW15, although at levels below the RBC.

Bedrock well BED-MW16 displayed total concentrations of antimony (93.1 µg/L), barium (1,210 µg/L), chromium (33.4 µg/L), manganese (10,300 µg/L), and vanadium (362 µg/L) at concentrations exceeding their respective RBCs. In the dissolved phase, lead (44.4 µg/L) and vanadium (140 µg/L) exceeded the RBCs in BED-MW16.

4.2.2.6 Total Cyanide

Neither of the two bedrock wells, BED-MW15 and BED-MW16, displayed detectable concentrations of cyanide during the GWI (Table 4-6).

4.3 TNT Area A

Five overburden and two bedrock wells were sampled in the vicinity of TNTA. These wells are summarized as follows:

- Overburden wells
  - TNTA-MW10
  - TNTA-MW11
  - MK-MW22
  - MK-MW23
  - MK-MW24

- Bedrock wells
  - BED-MW17
  - BED-MW18

The following sections present the analytical results for the five overburden wells, followed by the two bedrock wells. This discussion is divided by the monitored water-bearing zone and analytical parameters.

4.3.1 Overburden Wells

4.3.1.1 Volatile Organic Compounds

Of the five sampled overburden wells, only one well (TNTA-MW10) exhibited detectable levels of VOCs (Table 4-1). The detected concentration of acetone (23 µg/L) was present at levels below the established RBC.

4.3.1.2 Semivolatile Organic Compounds

There were no detectable concentrations of SVOCs in the five overburden wells during this GWI (Table 4-1).

4.3.1.3 Nitroaromatic Compounds

Two of the five overburden wells exhibited detectable levels of nitroaromatic compounds (Table 4-2, Figure 4-3). Seven nitroaromatic compounds were detected in monitoring well MK-MW22, but only 1,3,5-TNB (0.34 µg/L, total), 4-amino-2,6-DNT (1.1 µg/L, total, and 0.63 µg/L, dissolved), and nitrobenzene (0.91 µg/L, total, and 0.68 µg/L, dissolved) exceeded the respective RBCs. Only one nitroaromatic compound, 2,6-DNT, was detected in MK-MW23, but at a concentration below the RBC.

4.3.1.4 Pesticides and PCBs

Pesticides or PCBs were not detected in any of the five overburden wells (Table 4-2).

4.3.1.5 Inorganic Compounds

Each of the five sampled overburden wells exhibited detectable concentrations of metals during the GWI (Table 4-3, Figure 4-4). Monitoring wells TNTA-MW10 and TNTA-MW11 displayed total concentrations of arsenic (12.2 and 12.5 µg/L, respectively), iron (26,200 and 11,500 µg/L, respectively), and manganese (2,740 and 457 µg/L, respectively) that exceeded the RBCs. Dissolved iron exceeded the RBC in TNTA-MW10 at a concentration of 19,500 µg/L, but was

not detected in TNTA-MW11, while dissolved manganese exceeded the RBC in both wells (2,580 µg/L in TNTA-MW10 and 526 µg/L in TNTA-MW11).

In MK-MW22, total iron (4,520 µg/L), total manganese (643 µg/L), and dissolved manganese (269 µg/L) exceeded the respective RBCs. Monitoring well MK-MW23 exhibited only one inorganic compound, dissolved arsenic, at a concentration of 10.4 µg/L, exceeding the RBC of 0.045 µg/L. Four metals (iron, lead, manganese, and vanadium) exceeded the RBCs in MK-MW24. Total iron (4,720 µg/L), lead (4 µg/L), and manganese (348 µg/L) exceeded the respective RBCs, but these metals were not detected in the dissolved phase. Vanadium exceeded the RBC in both the total and dissolved samples from MK-MW24, with detected concentrations of 68.2 and 67.6 µg/L, respectively.

4.3.1.6 Total Cyanide

Total cyanide was not detected in any of the five sampled overburden wells (Table 4-3).

4.3.2 Bedrock Wells

4.3.2.1 Volatile Organic Compounds

Five VOCs (benzene, carbon disulfide, ethyl benzene, toluene, and total xylenes) were detected in both of the bedrock wells sampled during the GWI in TNTA (Table 4-4, Figure 4-8). Of these, benzene exceeded the RBC in BED-MW17 (18 µg/L) and BED-MW18 (7.9 µg/L), while ethyl benzene exceeded the RBC in BED-MW18 (130 µg/L) and toluene exceeded the RBC in BED-MW17 (140 µg/L).

4.3.2.2 Semivolatile Organic Compounds

Both bedrock wells exhibited detectable levels of SVOCs (Table 4-4, Figure 4-8). However, none of the detected SVOCs exceeded the established RBCs. One of the detected SVOCs in BED-MW18 (2,4-dimethylphenol at a concentration of 16 µg/L) does not have an established RBC.

4.3.2.3 Nitroaromatic Compounds

The two bedrock wells exhibited detectable levels of nitroaromatic compounds during the GWI (Table 4-5, Figure 4-9). Of the three detected nitroaromatics in BED-MW17 (2-nitrotoluene, nitrobenzene, and tetryl), only nitrobenzene exceeded the RBC at concentrations of 0.5 µg/L (total) and 0.51 µg/L (dissolved). In BED-MW18, 4-amino-2,6-DNT exceeded the RBC at

concentrations of 4 µg/L (total) and 21 µg/L (dissolved); 1,3-DNB and 2-nitrotoluene were also detected in this well, but at concentrations below the RBCs.

4.3.2.4 Pesticides and PCBs

Pesticides and PCBs were not detected in the two bedrock wells (Table 4-5).

4.3.2.5 Inorganic Compounds

Several inorganic compounds were detected in the two bedrock wells (BED-MW17 and BED-MW18). Four total metals (antimony at 61.4, barium at 1,230, iron at 428,000, and lead at 26.3 µg/L, respectively) exceeded the RBCs in BED-MW17, but only one dissolved metal (arsenic at 11.1 µg/L) exceeded the RBC (Table 4-6, Figure 4-10). In BED-MW18, three total metals (antimony at 109, barium at 1,290, and manganese at 131 µg/L, respectively) exceeded the RBC; dissolved metals were not detected in this well. In addition to total and dissolved inorganics in groundwater, strong H_2S gas was encountered during well sampling, indicating a possible reducing environment in the bedrock water-bearing zone.

4.3.2.6 Total Cyanide

Cyanide (total) was not detected in either of the two bedrock wells sampled in TNTA (Table 4-6).

4.4 TNT Area B

Two overburden wells were sampled in TNTB. These wells are summarized as follows:

- Overburden wells
  - MK-MW16
  - MK-MW17

The following sections present the analytical results for the two overburden wells.

4.4.1 Volatile Organic Compounds

Of the two sampled overburden wells, only MK-MW17 exhibited detectable levels of VOCs (Table 4-1). The detected concentration of toluene (1.8 µg/L) was present at levels below the established RBC.

4.4.2 Semivolatile Organic Compounds

Neither of the two overburden wells exhibited detectable concentrations of SVOCs (Table 4-1).

4.4.3 Nitroaromatic Compounds

Nitroaromatic compounds were not detected in MK-MW16 during the GWI. However, six nitroaromatic compounds (1,3,5-TNB, 1,3-DNB, 2,4,6-TNT, 2,4-DNT, 2,6-DNT, and 4-amino-2,6-DNT) were present in groundwater from MK-MW17 (Table 4-2, Figure 4-2). Of these, 1,3-DNB (2.2 µg/L), 2,6-DNT (11 µg/L), and 4-amino-2,6-DNT (8.7 µg/L) exceeded the RBCs in the total phase, and 1,3,5-TNB (2.3 µg/L), 2,4,6-TNT (3.4 µg/L), 2,6-DNT (11 µg/L), and 4-amino-2,6-DNT (5.8 µg/L) exceeded the RBCs in the dissolved phase.

4.4.4 Pesticides and PCBs

Pesticides and PCBs were not detected in the two overburden wells (Table 4-2).

4.4.5 Inorganic Compounds

Several metals were detected in the total or dissolved phases at concentrations exceeding the RBCs from MK-MW16 and MK-MW17 (Table 4-3, Figure 4-4). Five total metals (aluminum at 3,760, iron at 12,100, lead at 34.8, manganese at 12,000, and nickel at 114 µg/L, respectively) exceeded the RBCs in MK-MW16, while dissolved RBC exceedances were limited to manganese (11,600 µg/L) and nickel (148 µg/L). In MK-MW17, four metals exceeded the RBCs in the total and dissolved samples: arsenic at 10.2 and 11.4 µg/L, respectively; iron at 34,800 and 38,300 µg/L, respectively; manganese at 1,430 and 1,680 µg/L, respectively; and nickel at 156 and 182 µg/L, respectively.

4.4.6 Total Cyanide

Total cyanide was not detected in either of the two overburden wells (Table 4-3).

4.5 Background Well PB-BED-MW20

Bedrock monitoring well PB-BED-MW20 was installed by D&M for use as a possible background well. Located near the intersection of Patrol Road and Taft Road in the southwestern portion of the PBOW, this well is hydrogeologically upgradient of all bedrock wells at the site.

4.5.1 Volatile Organic Compounds

Upgradient bedrock well BED-MW20 did not show detectable levels of VOCs during the GWI (Table 4-4).

4.5.2 Semivolatile Organic Compounds

SVOCs were not detected in bedrock well BED-MW20 (Table 4-4).

4.5.3 Nitroaromatic Compounds

Monitoring well BED-MW20 did not exhibit detectable levels of nitroaromatic compounds during the GWI (Table 4-5).

4.5.4 Pesticides and PCBs

Pesticides and PCBs were not detected in BED-MW20 (Table 4-5).

4.5.5 Inorganic Compounds

Five total metals and one dissolved metal exceeded the respective RBCs in bedrock well BED-MW20 (Table 4-6, Figure 4-10). Total antimony (96.3 µg/L), total barium (26,400 µg/L), total iron (5,760 µg/L), total manganese (173 µg/L), total vanadium (59.4 µg/L), and dissolved vanadium (61.8 µg/L) exceeded the established RBCs.

4.5.6 Total Cyanide

Total cyanide was not detected in BED-MW20 (Table 4-6).

5.0 Hydrogeologic Characteristics

This chapter summarizes the hydrogeologic characteristics and the groundwater quality of the two water-bearing zones based on the data collected during this investigation and those available from previous studies. The hydrogeologic characteristics of the site are presented in terms of water-bearing zone distribution, groundwater flow direction, and hydraulic properties of both the overburden and bedrock water-bearing zones.

5.1 Major Water-Bearing Zones

Groundwater at the PBOW site occurs in two basic water-bearing zones: the overburden soils and the carbonate/clastic bedrocks. The overburden soils consist of original glacial till materials that have undergone intensive modern pedogenesis. The bedrock formations are Silurian and Devonian in age and dip regionally to the east. Soil covers and the underlying bedrock make up the site media that controls groundwater flow and affects contaminant migration.

Soil covers across the PBOW site are highly variable in terms of thickness and hydraulic properties. According to Soil Survey of Erie County conducted by the U.S. Department of Agriculture in cooperation with Ohio Department of Natural Resources, two soil associations are present at PBOW. The Arkport-Galden group, characterized by clayey fine sand and silt, covers the northern and western portions of the PBOW. The Prout association is mainly found in the southern and eastern portions of the facility and is underlain by clastic bedrock (shale). Soils of this group are clayey silt and silty clay, containing considerable amount of shale fragments at the bottom.

Bedrock encountered at the site consists of limestone/dolomite and shale. Bedrock shows a similar pattern with respect to the areal distribution, with limestone and dolomite mainly occurring in the northern and western portion of the site and shale in the eastern and southern part of the site. According to the PBOW preliminary assessment (SAIC, 1991), the lithology of the shale formation (Ohio Shale) is described as a grayish-black, dense, and platy shale that contains high organic content. Carbonate rocks encountered at the site are Prout Limestone, Delaware limestone, and the underlying Columbus limestone. Of these, Prout limestone crops out in the middle of the site extending northeast as a narrow band. The lithology of the Prout Limestone is seen as a dark colored fossiliferous limestone; Delaware limestone crops out in the northwestern corner of the site, while much of the western portion of the site is underlain by Columbus limestone. Both limestone formations may contain some evaporite deposits such as

gypsum and anhydrite (Shearrow, 1957; Janssens, 1977). The depths to bedrock revealed during soil boring and monitoring well drilling vary significantly across the site.

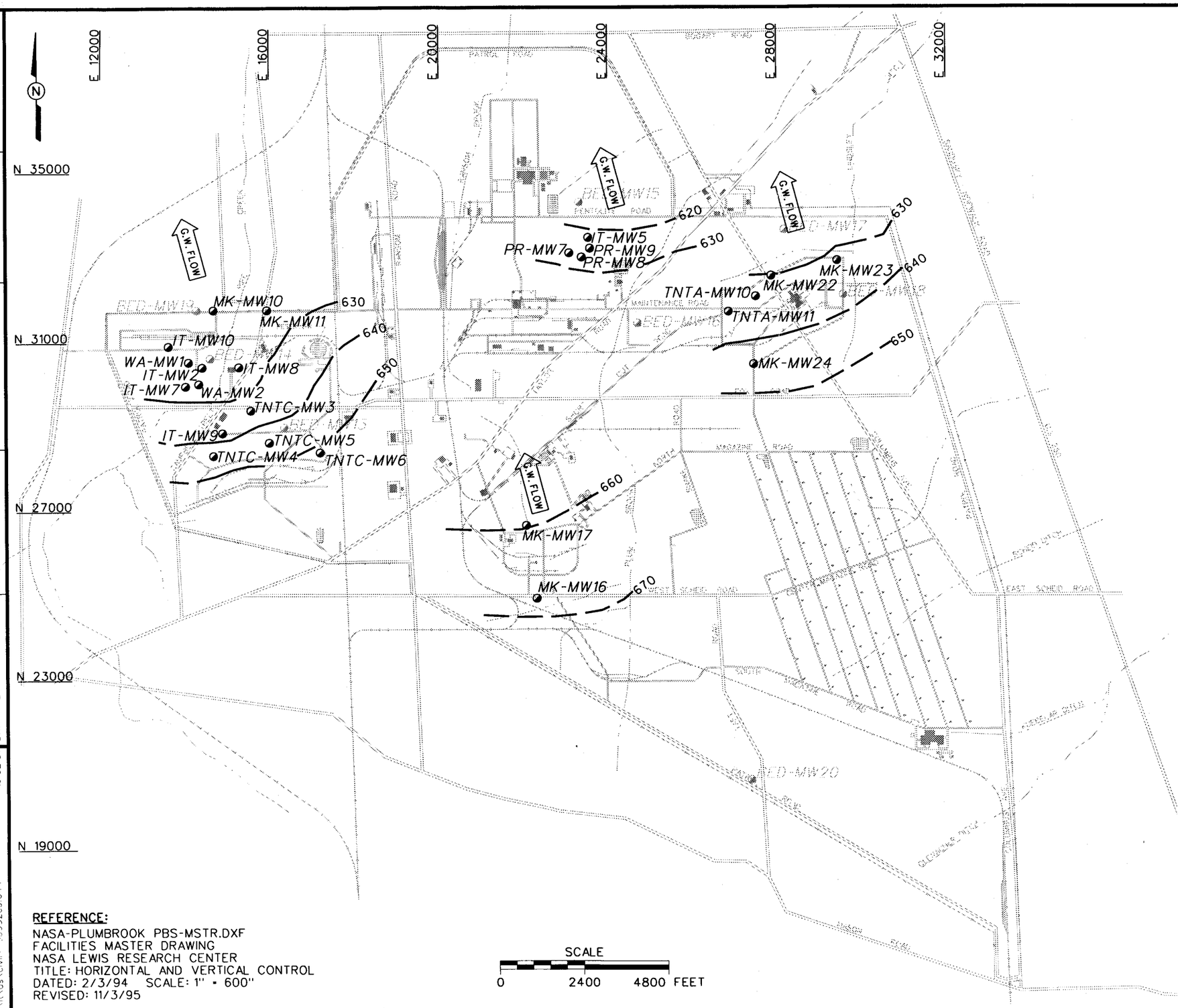
5.2 Groundwater Flow Conditions

5.2.1 Overburden Water-Bearing Zone

Twenty-three monitoring wells (including one piezometer) were measured in the overburden water-bearing zone. Among these wells, eight are at or near the WARWP, five at TNTC, two at TNTB, four at the Pentolite Road Red Water Ponds, and four at TNTA. The locations of these overburden wells are shown in Figure 4-7. Groundwater level elevation contours are plotted using water level data acquired in October 1996. Groundwater levels at most of these wells (except new wells installed during this investigation) were also measured by D&M in December 1994 and March 1995. These available data are used to characterize groundwater flow pattern in the overburden water-bearing zone.

Groundwater level elevation contour map for the overburden water-bearing zone was constructed for the October 1996 data as shown in Figure 5-1. It is noted that water level data are available in areas where investigations were conducted, while a large data gap exists in the central and southeastern portions of the site. Due to the fact that the overburden water-bearing zone at PBOW is highly variable with respect to its thickness and hydraulic properties, extrapolation of water level contours for a large area with no data might be subjective. Therefore, water level contours were constructed for four general areas of concern, including the WARWP/TNTC, the Pentolite Road Red Water Ponds, TNTA, and TNTB. Figure 5-1 shows the general groundwater flow in the overburden water-bearing zone is to the north, being the same as that reported by D&M (1996). In close vicinity of the WARWP, the local groundwater flow direction was shown to be quite different or even reverse, depending on the pool level of the surface water body.

Comparison of the October 1996 water level data to the two rounds of measurements (December 1994 and March 1995) showed considerable variations in water level elevations in most of the overburden wells. As shown in Table 2-5, with a few exceptions, water levels in October were generally lower than that in March and higher than in December, indicating strong seasonal fluctuation. During the field operations, standing water was observed in the vicinity of two overburden wells, PR-MW08 and PR-MW-09, both located in the Pentolite Road Red Water Pond area.



LEGEND:

- BUILDINGS
- FENCE (PBOW BOUNDARY)
- RAILROAD
- DITCH
- SURFACE POND
- EXISTING WELL
- G.W. FLOW — INTERPRETED GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION CONTOUR ELEVATION LINE (DASHED WHERE INFERED)

NOTES:

CONTOUR INTERVAL IS 10 FEET

REFERENCE:

NASA-PLUMBROOK PBS-MSTR.DXF
FACILITIES MASTER DRAWING
NASA LEWIS RESEARCH CENTER
TITLE: HORIZONTAL AND VERTICAL CONTROL
DATED: 2/3/94 SCALE: 1" = 600"
REVISED: 11/3/95

SCALE
0 2400 4800 FEET

FIGURE 5-1
GROUNDWATER ELEVATION CONTOUR MAP
OVERBURDEN WATER BEARING ZONE (OCTOBER, 1996)

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: R. KNIGHT	INITIATOR: G. YU	DWG. NO.:	
ENGR. CHCK. BY: G. YU	PROJ. MGR.: D. BURTON	PROJ. NO.:766952	
STARTING DATE: 4/24/97	DATE LAST		
DRAWN BY: R. KNIGHT	DRAWN BY:		

23 SEP 97 16:02:31
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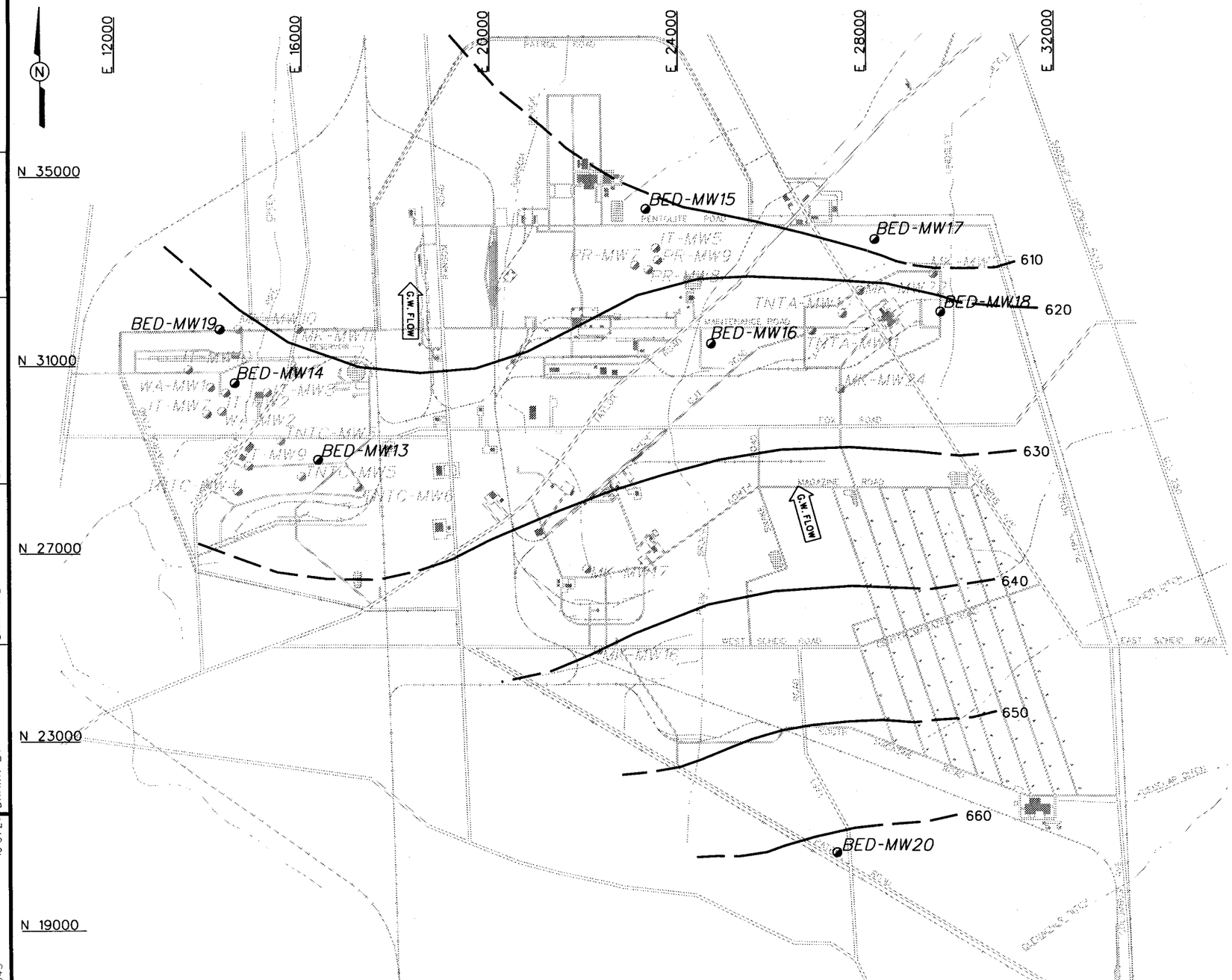
The site-specific hydraulic conductivity data of the overburden water-bearing zone are rare because of the difficulties in conducting well testing. The difficulty arose due to extremely low well yield in the overburden wells, possibly due to a seasonal low water level. Of the three monitoring wells installed, rising-head slug tests were successfully performed at IT-MW08, giving an average hydraulic conductivity of 9.62 feet per day (Appendix G). During the 1989 contamination evaluation conducted by IT (1991), a slug test was performed at IT-MW02 and the hydraulic conductivity was calculated to be 0.25 feet per day. No hydraulic conductivity data are available or reported at other overburden wells due to low well yield or the well being dry at the time of testing. In 1990, the U.S. Geological Survey (USGS) conducted a study on the hydraulic properties of glacial deposits in Ohio. Pumping test conducted in wells installed in till-bearing glacial and lacustrine deposits in Sandusky County indicated a hydraulic conductivity of 1.17 feet per day (Strobel, 1992).

5.2.2 Bedrock Water-Bearing Zone

Groundwater levels at eight bedrock wells installed by D&M were measured during this investigation. The locations of these bedrock wells are shown in Figure 4-7. Bedrock wells were installed in the competent limestone at depths ranging from 50 to 75 feet bgs and the depths to the top of bedrock ranged from approximately 20 to 44 feet bgs. Groundwater flow in the bedrock water-bearing zone occurs primarily along fracture zones. Since the underlying bedrocks are limestone, it is very likely that solutionally enlarged fractures serve as a preferential pathway for site groundwater. In fact, according to the USGS, the carbonate rocks in northern Ohio, including the Devonian Columbus limestones, are considered as part of the carbonate-bedrock water-bearing zone system (Bugliosi, 1990).

Figure 5-2 shows that the general groundwater flow in the bedrock water-bearing zone is to the north, being the same as that reported by D&M (D&M, 1996) and similar to that in the overburden water-bearing zone. The contour map as shown in Figure 5-2 is highly speculative because (1) only eight data points were used in construction of the contour map and (2) groundwater flow in the bedrock is controlled not only by regional gradient but also by the orientation of fracture zones which is little known at this area. Therefore, Figure 5-2 is presented only to demonstrate the general flow direction in the bedrock water-bearing zone at the site. In each area of concern, the determination of site-specific flow pattern and flow regime in the bedrock zone would require more water level data.



LEGEND:

- BUILDINGS
- FENCE (PBOW BOUNDARY)
- RAILROAD
- DITCH
- SURFACE POND
- EXISTING WELL
- G.W. FLOW — GROUNDWATER FLOW DIRECTION
- WATER LEVEL ELEVATION CONTOUR LINE (DASHED WHERE INFERED)

NOTES:

CONTOUR INTERVAL IS 10 FEET

REFERENCE:
NASA-PLUMBROOK PBS-MSTR.DXF
FACILITIES MASTER DRAWING
NASA LEWIS RESEARCH CENTER
TITLE: HORIZONTAL AND VERTICAL CONTROL
DATED: 2/3/94 SCALE: 1" = 600"
REVISED: 11/3/95

SCALE
0 2400 4800 FEET

FIGURE 5-2
BEDROCK GROUNDWATER ELEVATION CONTOUR MAP (OCTOBER, 1996)

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: R. KNIGHT | INITIATOR: G. YU | DWG. NO.: 766043
ENGR. CHCK. BY: G. YU | PROJ. MGR.: D. BURTON | PROJ. NO.: 766952
DATE LAST | STARTING DATE: 4/24/97
DRAWN BY: | DRAWN BY: R. KNIGHT
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5.3 Hydraulic Connection Between Two Water-Bearing Zones

The overburden water-bearing zone lies directly on top of the bedrock across the site. During monitoring well installation, no significant layer with low permeability that would retard downward flow was encountered. Comparison between the two water level contour maps (Figures 5-1 and 5-2) shows that the water level elevations of the bedrock wells are generally lower than those observed in the overburden wells, indicating a possible downward flow component. This is consistent with the conclusion made by D&M in their GWI report (D&M, 1996). However, in some portions of the site, the overburden materials may not contain any water when the water levels are lower than the bottom elevation of the soil, suggesting that the downward flow from overburden zone to the bedrock zone occurs only seasonally. There is also another possibility that groundwater in the shallow water-bearing zone may move upward during the summer months due to evapotranspiration. It is estimated that approximately 70 percent of the annual precipitation in Ohio is returned to the atmosphere by evapotranspiration (Shindel, et al., 1990).

6.0 Conclusions and Recommendation

This section presents conclusions and recommendations from the GWI at the former PBOW based on the analytical results presented in Chapter 4.0 and hydrogeology discussed in Chapter 5.0. With the exception of groundwater flow condition, conclusions concerning groundwater quality are presented by geographic area and monitored water-bearing zone.

6.1 Conclusions

The following conclusions are derived from the results of the current GWI within the former PBOW.

6.1.1 Groundwater Flow

Groundwater across PBOW site exists in both overburden and bedrock water-bearing zones. The general groundwater flow direction in both water-bearing zones is to the north and northeast. However, local flow regime in the overburden may be different depending on soil thickness, topography, and surface water features and exhibits strong seasonal dependence. Some overburden wells may become dry at certain times of the year. The groundwater flow regime in the bedrock is believed to be influenced by solutionally enlarged fractures. The difference in water level elevations in both water-bearing zones indicates a predominantly downward flow, but water in the shallow depth can also move upward and be lost to evapotranspiration

6.1.2 West Area Red Water Ponds and TNT Area C

Eleven overburden and three bedrock wells were sampled in the vicinity of the WARWP and TNTC. Two (TNTC-MW03 and MK-MW10) of the 11 overburden wells exhibited low levels of VOCs, but did not exceed RBCs. Nitroaromatic compounds were detected under the SVOC analysis at concentrations exceeding the RBCs in IT-MW02 and WA-MW02; SVOCs were also detected in TNTC-MW03 but did not exceed the RBCs. Similarly, IT-MW02 and WA-MW02 both exhibited nitroaromatic compounds at concentrations exceeding the RBCs under the explosives analysis. Explosives were also detected in IT-MW06, but the concentrations did not exceed the RBCs. Each of the 11 overburden wells also exhibited inorganic compounds at concentrations exceeding the RBCs. RBC exceedances in overburden wells are summarized as follows:

- ***IT-MW06.*** Aluminum, arsenic, barium, chromium, iron, lead, and manganese
- ***IT-MW08.*** Manganese and vanadium

- ***IT-MW02.*** 1,3,5-TNB, 1,3-DNB, 2,4-DNT, 2,6-DNT, 4,6-dinitro-2-methylphenol, RDX, iron, lead, and manganese

- ***WA-MW01.*** Iron and manganese

- ***WA-MW02.*** 1,3,5-TNB, 1,3-DNB, 2,4,6-TNT, 2,4-DNT, 3-nitroaniline, 4-amino-2,6-DNT, aluminum, arsenic, chromium, iron, manganese, nickel, and vanadium

- ***MK-MW10.*** Aluminum, arsenic, chromium, iron, lead, and manganese

- ***MK-MW11.*** Iron, lead, and manganese

- ***TNTC-MW03.*** Aluminum, arsenic, barium, chromium, iron, lead, manganese, nickel, and vanadium

- ***TNTC-MW04.*** Aluminum, arsenic, chromium, iron, lead, manganese, and vanadium

- ***TNTC-MW05.*** Iron, lead, and manganese

- ***TNTC-MW06.*** Chromium, iron, and manganese

With the exception of nitroaromatic compounds and total cyanide (RBC not established) in IT-MW02 and WA-MW02, detected constituents exceeding RBC values were limited to inorganic compounds in the 11 overburden wells. Of the metals exceeding RBCs, only lead, manganese, nickel, and vanadium were detected in any of the wells at concentrations exceeding the RBCs in the dissolved phase; two of the wells (MK-MW10 and MK-MW11) did not exhibit dissolved metals at concentrations exceeding the RBCs.

Based on the analytical results for the overburden wells, it is evident that IT-MW02 and WA-MW02 have been impacted by nitroaromatic compounds by past site activities. In addition, nine wells (IT-MW06, IT-MW08, IT-MW02, WA-MW01, WA-MW02, TNTC-MW03, TNTC-MW04, TNTC-MW05, and TNTC-MW06) exhibit inorganic compounds at concentrations exceeding the RBCs in the dissolved phase, which may be due to site contamination or naturally occurring conditions; background levels for inorganic compounds in groundwater have not been established. Because dissolved metals were not detected in MK-MW10 and MK-MW11, the total metals RBC exceedances in these wells are attributed to suspended solids in the groundwater samples.

Two of the three sampled bedrock wells exhibited VOCs at concentrations exceeding the RBCs: BED-MW13 and BED-MW19. SVOCs were detected in each of the three wells, but only BED-MW13 exhibited an SVOC compound at a concentration exceeding the RBC. Nitroaromatic compounds exceeded the RBCs in BED-MW13 and BED-MW19. Although each of the three bedrock wells had detectable levels of inorganic compounds, only BED-MW13 and BED-MW19 had levels exceeding their respective RBCs. RBC exceedances in bedrock wells are summarized as follows:

- ***BED-MW13.*** Benzene, toluene, 2-methylnaphthalene, 4-amino-2,6-DNT, nitrobenzene, barium, and vanadium
- ***BED-MW14.*** None
- ***BED-MW19.*** Benzene, nitrobenzene, and barium.

Based on the analytical results from the three bedrock wells, it is evident that BED-MW13 and BED-MW19 have been impacted by explosives and organic contaminants from past site activities. BED-MW14 also exhibits impacts by these constituents, but at levels below the RBCs. Bedrock wells BED-MW13 and BED-MW19 also exhibit at least one inorganic compound exceeding the RBCs, but these levels are not necessarily attributable to site contamination as background levels have not been established. In addition, BED-MW13 exhibited strong H_2S gas that could be hazardous during well sampling.

In general, it is concluded that the overburden water-bearing zone in TNTC has not been impacted by organic compounds, nitroaromatic compounds, or pesticides and PCBs. A small number of metals have exceeded the RBCs in the dissolved phase, but further evaluation is needed to determine whether these detections are attributable to site contamination. The overburden water-bearing zone exhibits impacts by nitroaromatic compounds in the central portion of the WARWP area, while inorganic compounds are present at concentrations exceeding the RBCs throughout this area. However, as with TNTC, detected metals in groundwater in the WARWP area will require further evaluation to determine whether these are due to site contamination.

The bedrock water-bearing zone has been impacted by nitroaromatic and organic compounds in TNTC and north of the WARWP area, but does not exhibit impacts by any constituents in the central portion of the WARWP area. Inorganic compounds have also exceeded the RBCs in

TNTC and north of the WARWP area, but these exceedances will require further evaluation to determine their source.

6.1.3 Pentolite Road Red Water Pond Area

Four overburden and two bedrock wells were sampled in the vicinity of the Pentolite Road Red Water Pond area. None of the four overburden wells exhibited VOCs at concentrations exceeding the RBCs, although IT-MW05 had detectable concentrations of chlorobenzene and toluene. Nitroaromatic compounds exceeded the RBCs in PR-MW07, PR-MW08, and PR-MW09 under the SVOC and explosives analyses. SVOCs and explosives were not detected in IT-MW05. Inorganic compounds exceeded the RBCs in each of the four overburden wells. RBC exceedances in the four overburden wells are summarized as follows:

- ***IT-MW05.*** Arsenic, barium, iron, and manganese
- ***PR-MW07.*** 1,3,5-TNB, 1,3-DNB, 2,4,-DNT, 2,6-DNT, RDX, chromium, cobalt, copper, iron, manganese, nickel, and vanadium
- ***PR-MW08.*** 1,3,5-TNB, 1,3-DNB, 2,4,6-TNT, 2,4-DNT, 2,6-DNT, 4,6-dinitro-2-methylphenol, RDX, antimony, cadmium, chromium, cobalt, copper, iron, manganese, nickel, and vanadium
- ***PR-MW09.*** 1,3,5-TNB, 1,3-DNB, 2,4-DNT, 2,6-DNT, antimony, chromium, cobalt, copper, iron, manganese, nickel, and vanadium.

Based on the analytical results for the overburden wells, it is evident that PR-MW07, PR-MW08, and PR-MW09 have been impacted by nitroaromatic compounds by past site activities. Each of the four wells also exhibit inorganic compounds at concentrations exceeding the RBCs, with greater impacts evident in the PR-series wells. However, background concentrations have not been established for metals in groundwater at PBOW, and it is unclear whether these RBC exceedances are due to site contamination.

Both of the sampled bedrock wells exhibited VOCs and SVOCs at concentrations exceeding the RBCs. Both wells also exhibited nitroaromatic compounds, but only the detections in BED-MW15 exceeded the respective RBCs. Inorganic compounds were detected in each well at concentrations exceeding the RBCs. In addition, petroleum product was observed in BED-MW16. RBC exceedances in the two bedrock wells are summarized as follows:

- ***BED-MW15.*** Benzene, chloroform, ethyl benzene, toluene, bis(2-ethylhexyl)phthalate, 2-methylnaphthalene, 1,3,5-TNB, 1,3-DNB, RDX, antimony, and barium

- ***BED-MW16.*** Benzene, chloroform, ethyl benzene, toluene, total xylenes, 2-methylnaphthalene, antimony, barium, chromium, lead, manganese, and vanadium.

Based on the analytical results from the two bedrock wells, it is evident that BED-MW15 and BED-MW16 have been impacted by organic contaminants from past site activities. In addition, BED-MW15 also exhibits impacts by nitroaromatic compounds. Both wells also exhibit at least two inorganic compounds at concentrations exceeding the RBCs, but these levels are not necessarily attributable to site contamination as background levels have not been established. In addition, BED-MW16 also contained floating petroleum product that may be the source of dissolved benzene, toluene, ethyl benzene, and xylene (BTEX) detected in both bedrock wells in this area.

In general, it is concluded that the overburden water-bearing zone in the Pentolite Road Red Water Pond area has been impacted by nitroaromatic compounds, while the bedrock water-bearing zone exhibits impacts by BTEX, SVOCs, and nitroaromatic compounds. Although the Pentolite Road Red Water area water-bearing zones exhibit larger suites of inorganic compounds at concentrations exceeding the RBCs than other areas of PBOW, further evaluation is necessary to determine whether they are attributable to site contamination.

6.1.4 TNT Area A

Five overburden and two bedrock wells were sampled in the vicinity of TNTA. None of the five overburden wells exhibited concentrations of VOCs or SVOCs that exceeded the RBCs. Two wells had detectable levels of nitroaromatic compounds, but only MK-MW22 exhibited explosives at concentrations exceeding the RBCs. All of the overburden wells exhibited inorganic compounds at concentrations exceeding the RBCs. The RBC exceedances for each of the five wells is summarized as follows:

- ***TNTA-MW10.*** Arsenic, iron, and manganese
- ***TNTA-MW11.*** Arsenic, iron, and manganese
- ***MK-MW22.*** 1,3,5-TNB, 4-amino-2,6-DNT, nitrobenzene, iron, and manganese
- ***MK-MW23.*** Arsenic
- ***MK-MW24.*** Iron, lead, manganese, and vanadium.

Based on the analytical results for the overburden wells, it is evident that MK-MW22 has been impacted by nitroaromatic compounds from past site activities. Each of the five wells also exhibit at least one inorganic compound at concentrations exceeding the RBCs. However, background concentrations have not been established for metals in groundwater at PBOW, and it is unclear whether these RBC exceedances are due to site contamination.

VOCs were detected at concentrations exceeding the RBCs in both bedrock wells during the GWI, and SVOCs were detected but did not exceed RBCs. Nitroaromatic compounds were also detected at concentrations exceeding the RBCs in BED-MW17 and BED-MW18. Several inorganic compounds were detected at concentrations exceeding the RBCs in both wells. RBC exceedances in the two bedrock wells are summarized as follows:

- ***BED-MW17.*** Benzene, toluene, nitrobenzene, antimony, arsenic, barium, iron, and lead
- ***BED-MW18.*** Benzene, ethyl benzene, 4-amino-2,6-DNT, antimony, barium, and manganese.

The analytical results from the two monitoring wells indicate that both BED-MW17 and BED-MW18 have been impacted by organic and nitroaromatic compounds from past site activities. Although several metals were detected at concentrations exceeding the RBCs, only one (arsenic) was present in the dissolved sample and only in BED-MW17, which suggests that the other metals RBC exceedances are attributable to suspended solids in the unfiltered sample and are not necessarily due to site contamination. However, site background levels of inorganic compounds have not been developed for groundwater at PBOW. H_2S gas was detected in both bedrock wells, indicating a possible strong reducing environment in the bedrock zone.

It is concluded that the overburden water-bearing zone has been impacted by nitroaromatic contaminants in the vicinity of MK-MW22 in the western part of TNTA. The bedrock water-bearing zone exhibits impacts by BTEX and nitroaromatic compounds in the northeastern part of TNTA. Further evaluation is, however, necessary to determine whether detected inorganic in the two water-bearing zones are attributable to site contamination.

6.1.5 TNT Area B

Two overburden wells and one bedrock well were sampled in the vicinity of TNTB. Neither overburden well exhibited organic contaminants at concentrations exceeding the RBCs. Nitroaromatic compounds were not detected in MK-MW16, but exceeded RBCs in MK-MW17.

Several inorganic compounds also exceeded the RBCs in both wells. The RBC exceedances for each well are summarized as follows:

- ***MK-MW16.*** Aluminum, iron, lead, manganese, and nickel
- ***MK-MW17.*** 1,3,5-TNB, 1,3-DNB, 2,4,6-TNT, 2,6-DNT, 4-amino-2,6-DNT, arsenic, iron, manganese, and nickel.

Based on the analytical results from the two overburden wells, it is evident that MK-MW17 has been impacted by nitroaromatic compounds from past site activities. Although several metals exceeded the RBCs in both wells, only manganese and nickel exceeded the RBCs in the dissolved phase in MK-MW16. This indicates that the RBC exceedances of aluminum, iron, and lead in this well are attributable to suspended solids in the unfiltered sample. As background concentrations have not been established for metals in groundwater at PBOW, it is unclear whether the inorganic compounds detected at concentrations exceeding the RBCs are attributable to site contamination.

It is concluded that the overburden water-bearing zone has been impacted by nitroaromatic compounds downgradient of TNTB. Further evaluation is necessary to determine whether detected inorganic compounds are attributable to site contamination or natural conditions

6.1.6 PB-BED-MW20

The upgradient bedrock well, BED-MW20, was sampled during the GWI. Analytical results from this well indicate that it has not been impacted by organic or explosive compounds from past activities. Five metals did exceed RBCs from this well, but only vanadium was detected in both the total and dissolved samples. Therefore, the RBC exceedances of total antimony, barium, iron, and manganese are attributed to suspended solids in the unfiltered sample. Because background concentrations of metals have not been established for groundwater at PBOW, the RBC exceedance of vanadium requires further evaluation to determine whether it is due to natural conditions.

It is, therefore, concluded that the bedrock water-bearing zone upgradient in relation to other bedrock wells at PBOW does not exhibit impacts by organic or nitroaromatic compounds. However, further evaluation is necessary to determine whether detected inorganic compounds are attributable to site contamination or natural conditions

6.2 Recommendations

Based on the analytical results and conclusions of the sitewide GWI, the following recommendations are made:

- Installation and sampling of additional monitoring wells at various locations are recommended to more accurately define the nature and extent of contaminants in groundwater in the overburden and bedrock water-bearing zones. Specifically, additional overburden and bedrock wells are recommended as follows:

  ### Bedrock Wells

  - One at the G-8 Burning Ground (corner of Campbell Street and Patrol Road) to provide water quality data upgradient of the WARWP and TNTC.

  - One near MK-MW16 (TNTB) to provide upgradient water quality data for TNTB and one near MK-MW17 (TNTB) to provide downgradient water quality data for TNTB.

  - One in the Maintenance Area to provide upgradient water quality data for the Pentolite Road Red Water Pond area.

  - One each (three total) in Acid Areas 1, 2, and 3 to provide bedrock water-bearing zone water quality data in these areas.

  - One in the Additional Burn Ground (intersection of Fox Road and Snake Road) to provide groundwater quality data upgradient of TNTA, the Pentolite Road Area, and the Maintenance Area.

  ### Overburden Wells

  - One each (three total) in Acid Areas 1, 2, and 3 to provide overburden water-bearing zone water quality data in these areas. These wells should be placed close to the proposed bedrock well in each area to form a well pair so that appropriate test can be performed to determine the vertical hydraulic gradient.

  - One in the Additional Burn Ground (intersection of Fox Road and Snake Road) to provide groundwater quality data upgradient of TNTA, the Pentolite Road Red Water Pond area, and the Maintenance Area. This well should also be placed close to the bedrock well as a well cluster.

- Groundwater level measurements should be collected from all PBOW wells on a quarterly basis for a period of 1 year to determine groundwater gradient variations.

- Selected monitoring wells should be sampled once during the wet season and once during the dry season to determine possible impacts on contaminant migration at the site.

- Existing and new monitoring wells should be evaluated to determine their suitability as background wells; once selected, analytical data from background wells shall be statistically evaluated to determine naturally occurring background concentrations for inorganic compounds so that metals in groundwater samples can be fully evaluated

- All future groundwater data shall be collected in order to support (1) sitewide groundwater flow and transport modeling and (2) a human health risk assessment.

The outlined recommendations will be addressed during the sitewide groundwater level investigation recently contracted to IT. Data collected from the upcoming investigation will be combined with data collected during this GWI and previous GWIs conducted by others in order to provide a comprehensive sitewide groundwater quality evaluation. In addition, the following recommendations should be considered in scoping future studies at the PBOW site:

- Additional groundwater sampling of the overburden water-bearing zone in the vicinity of the two red water pond areas to delineate the lateral extent of nitroaromatic contamination. Hydropunch is the recommended methodology for this additional sampling effort.

- Geochemical evaluation of bedrock chemical data to determine the source of the H_2S gas detected in the bedrock water-bearing zone and possible impact on contaminant migration.

7.0 References

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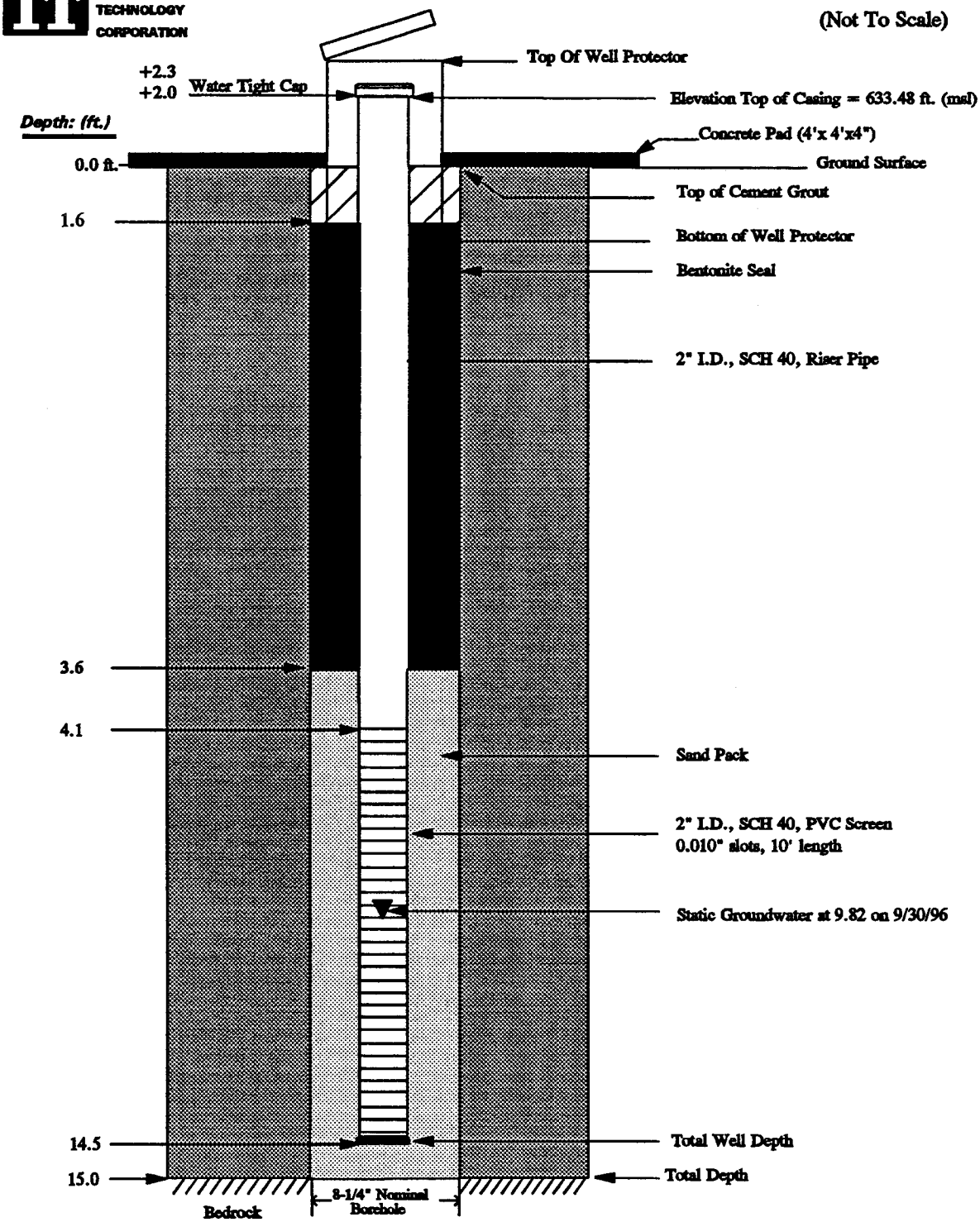
APPENDIX A

DRILL LOGS, GEOTECHNICAL DATA, AND WELL CONSTRUCTION DIAGRAM

INTERNATIONAL TECHNOLOGY CORPORATION

(Not To Scale)



Well Construction Diagram
prepared for:

USACE - NASHVILLE

PLUM BROOK ORDNANCE WORKS

Notes:

Well No.: IT-MW8

Date Installed: 9/27/96

Elevation Top of Casing*:

* Based on Mean Sea Level (MSL)

F:\BOW\BORINGS\WCMW8.DRW/mo/09-25-97

HTRW DRILLING LOG

DISTRICT: Nashville		HOLE NUMBER: IT-MW8
1. COMPANY NAME: IT Corporation	2. DRILL SUBCONTRACTOR: Alliance	SHEET 1 OF 3 SHEETS
3. PROJECT: PBOW	4. LOCATION: Erie County, Ohio	
5. NAME OF DRILLER: Paul D. McAdams	6. MANUFACTURER'S DESIGNATION OF DRILL: Dietrich D-50	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" Split Spoons, 8-1/2" O.D. Augers	8. HOLE LOCATION: Near Old Pump House by Powerhouse #2	
	9. SURFACE ELEVATION: 630.92 feet (MSL)	
	10. DATE STARTED: 9/25/96	11. DATE COMPLETED: 9/27/96
12. OVERBURDEN THICKNESS: 10.4 ft.	15. DEPTH GROUNDWATER ENCOUNTERED:	
13. DEPTH DRILLED INTO ROCK: 4.6 ft.	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 9.82 ft./5 days	
14. TOTAL DEPTH OF HOLE: 15.0 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

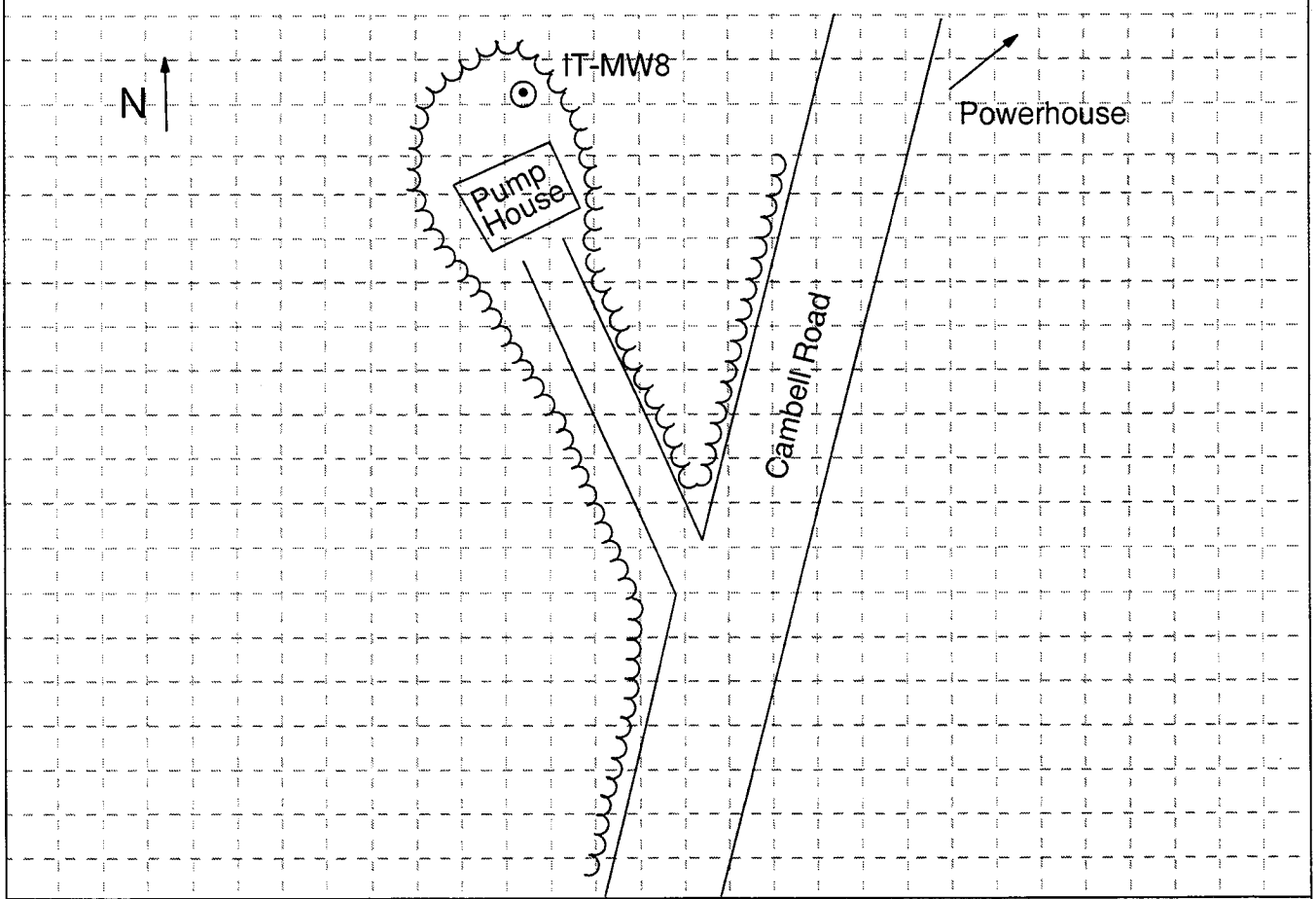
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
X	X		

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
NA						%

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X		Wesley White

LOCATION SKETCH/COMMENTS

SCALE: Not to scale



PROJECT	HOLE NO.
PBOW	IT-MW8

PBOW/BORINGS/MW-8.DRW/MC/11-12-96

INTERNATIONAL TECHNOLOGY CORPORATION

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NO. IT-MW8

PROJECT: PBOW | INSPECTOR: W. White | SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	USCS f	BLOW COUNTS g	REMARKS h
	1	Stiff to hard, dark gray (10 YR 4/1) clayey SILT, medium to low plasticity, low dry strength, trace organics (roots), moist	0.0	S-1	ML	2,3 5,6	
	2	2.2					2
	3	Hard, brown (10 YR 5/3), clayey SILT, trace very fine sand, low to medium plasticity, low dry strength, dry to moist (well below plastic limit)	0.0	S-2 Geotechnical Sample	ML	6,7 9,11	
	4	4.2					4
	5	Dense, strong brown (7.5 YR 5/6) mottled with pinkish gray (7.5 YR 7/2), silty very fine SAND, well sorted, poorly graded, well rounded, dry to moist	0.0	S-3 Geotechnical Sample	SP	6,5 4,4	
		5.75					
	6	Hard, gray (10 YR 5/1), very fine sandy SILT, low plasticity, low dry strength, dry to moist			ML		6
		6.3					
	7	Very stiff to hard, grayish brown (10 YR 5/2) CLAY, medium to high plasticity, moist	0.0	S-4 Geotechnical Sample	CL/CH	4,5 5,10	
	8	8.0					8
	9	Hard, grayish brown (10 YR 5/2) sitly CLAY, trace medium to coarse sand, medium plasticity, moist	0.0	S-5	CL	5,11 14,17	
		9.6					
	10	Very stiff to hard, silty CLAY and weathered shale, bluish gray (5 PB 6/1), low			CL		10

Project: PBOW | Hole No. IT-MW8

INTERNATIONAL TECHNOLOGY CORPORATION

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NO. IT-MW8

PROJECT: PBOW | INSPECTOR: W. White | SHEET 3 OF 3 SHEETS

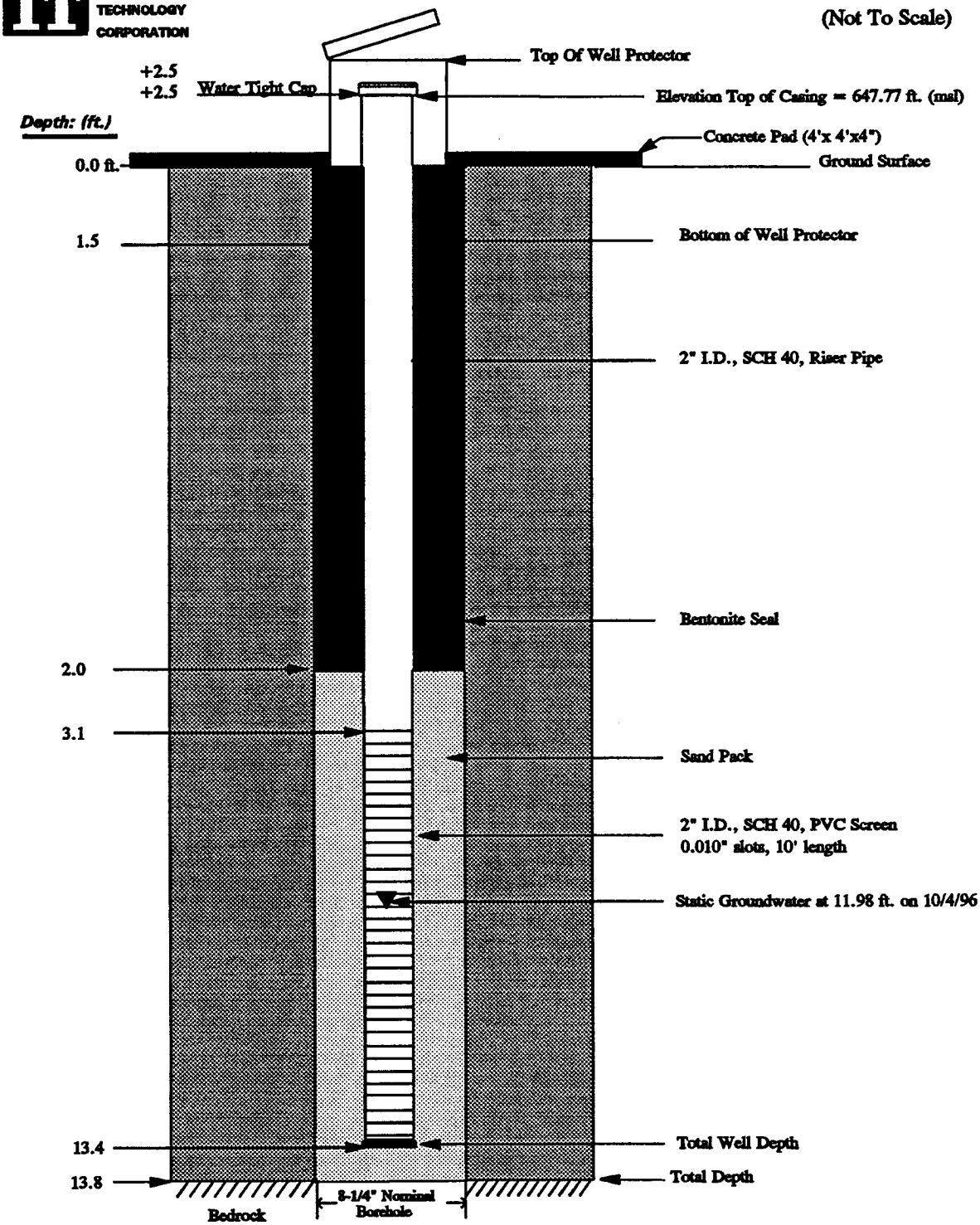
ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	USCS f	BLOW COUNTS g	REMARKS h
	10	10.4			CL		
		Very hard, bluish gray (10 B 6/1), shale, dry 10.8	0.0	S-6		10,12 13,16	
	11	Weathered shale zone, bluish gray (5 PB 6/1), moist 11.3					
		Very hard, bluish gray (10 B 6/1), shale, dry 12.0					
	12	Weathered shale zone, bluish gray (5 PB 6/1), moist 12.8					
	13	Very hard, bluish gray (10 B 6/1), shale, dry	0.0	S-7		7,14 80-6	
	14						Augered down 1 ft. hard
	15	15.0 Total Depth = 15.0 Ft.					Hit refusal at 15 ft.
	16						
	17						
	18						
	19						
	20						

Project: PBOW | Hole No. IT-MW8

INTERNATIONAL TECHNOLOGY CORPORATION

INTERNATIONAL TECHNOLOGY CORPORATION

(Not To Scale)



Well Construction Diagram
prepared for:
USACE - NASHVILLE
PLUM BROOK ORDNANCE WORKS

Notes:

Well No.: IT-MW9
Date Installed: 9/26/96
Elevation Top of Casing*:
* Based on Mean Sea Level (MSL)

FBOW\BORINGS\WCMW9.DRW/mo/09-25-97

HTRW DRILLING LOG

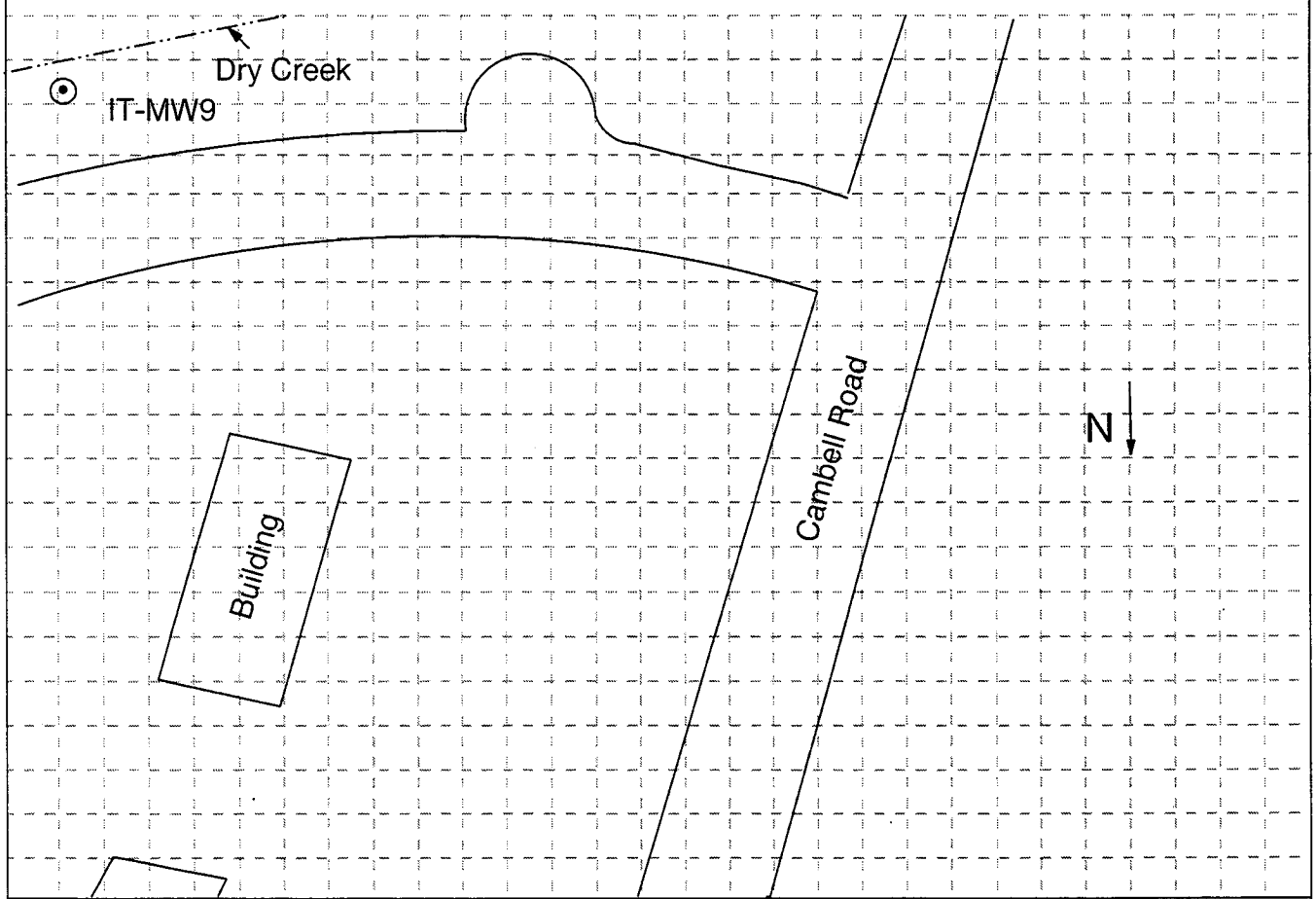
DISTRICT: Nashville		HOLE NUMBER: IT-MW9
1. COMPANY NAME: IT Corporation	2. DRILL SUBCONTRACTOR: Alliance	SHEET 1 OF 3 SHEETS
3. PROJECT: PBOW	4. LOCATION: Erie County, Ohio	
5. NAME OF DRILLER: Paul D. McAdams	6. MANUFACTURER'S DESIGNATION OF DRILL: Dietrich D-50	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" Split Spoons, 8-1/2" O.D. Augers	8. HOLE LOCATION: North at TOT Area C	
	9. SURFACE ELEVATION: 645.72 feet (MSL)	
	10. DATE STARTED: 9/25/96	11. DATE COMPLETED: 9/27/96
12. OVERBURDEN THICKNESS: 9.0 ft.	15. DEPTH GROUNDWATER ENCOUNTERED:	
13. DEPTH DRILLED INTO ROCK: 6.0 ft.	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 12.2 ft./5 days	
14. TOTAL DEPTH OF HOLE: 15.0 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
X	X		

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
NA						%

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X		Wesley White

LOCATION SKETCH/COMMENTS SCALE: Not to scale



PROJECT	HOLE NO.
PBOW	IT-MW9

PBOW/BORINGS/MW-9.DRW/MC/11-12-96

INTERNATIONAL TECHNOLOGY CORPORATION

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NO. IT-MW9

PROJECT: PBOW | INSPECTOR: W. White | SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	USCS f	BLOW COUNTS g	REMARKS h
	1	Firm to hard, dark grayish brown (10 YR 4/2), silty CLAY, medium plasticity, blocky, dry to moist (near the plastic limit) 2.0	0.0	S-1	CL	1,3 6,8	
	2	Hard to very hard, brown (10 YR 5/3) silty CLAY, medium plasticity, blocky, trace medium sand, dry to moist (below plastic limit)	0.0	S-2 Geotechnical Sample	CL	7,10 14,21	
	4		0.0	S-3 Geotechnical Sample		8,15 21,25	
	5	10% fine to medium SAND, trace fine gravel and coarse sand size shale fragments					
	6		0.0	S-4 Geotechnical Sample		12,19 25,20	
	7	7.25					
	8	Hard, dark grayish brown (10 YR 4/2) silty CLAY, 25% sand of various sizes, medium plasticity, trace fine gravel, blocky, dry to moist 8.2			CL		
	9	Hard to very hard, bluish gray (10 B 5/1) silty CLAY, medium plasticity, blocky to platey, trace medium sand, dry to moist 9.0	0.0	S-5	CL	9,14 19,29	
	10	Weathered shale, platey					

Project: PBOW | Hole No. IT-MW9

IT INTERNATIONAL TECHNOLOGY CORPORATION

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NO. IT-MW9

PROJECT: PBOW | INSPECTOR: W. White | SHEET 3 OF 3 SHEETS

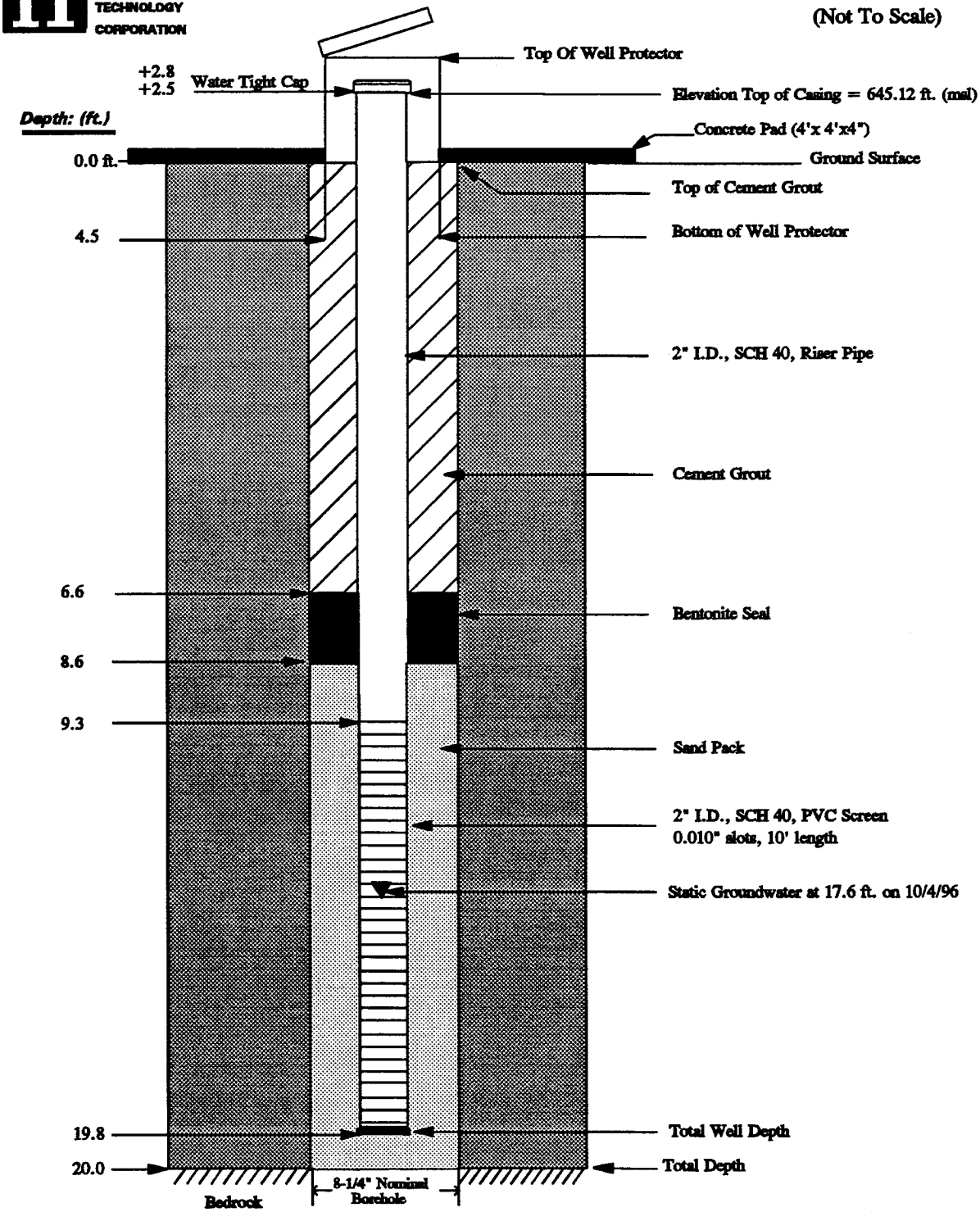
ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	USCS f	BLOW COUNTS g	REMARKS h
	10	Very hard, buish gray (10 B 6/1) shale, dry	0.0	S-6		29,44 59, 50=3-1/2	Shale broke up easily
	11						
	12		0.0	S-7		23.5 100:5	
	13						
	14						Augered down to 15 ft.
	15	15.0					
		Total Depth = 15.0 Ft.					
	16						
	17						
	18						
	19						
	20						

Project: PBOW | Hole No. IT-MW9

IT INTERNATIONAL TECHNOLOGY CORPORATION

INTERNATIONAL TECHNOLOGY CORPORATION

(Not To Scale)



Well Construction Diagram
prepared for:

USACE - NASHVILLE
PLUM BROOK ORDNANCE WORKS

Notes:

Well No.: IT-MW10
Date Installed: 9/26/96
Elevation Top of Casing*:
* Based on Mean Sea Level (MSL)

PBOW\BORINGS\WCMW6.DEW/mo/9-25-97

HTRW DRILLING LOG

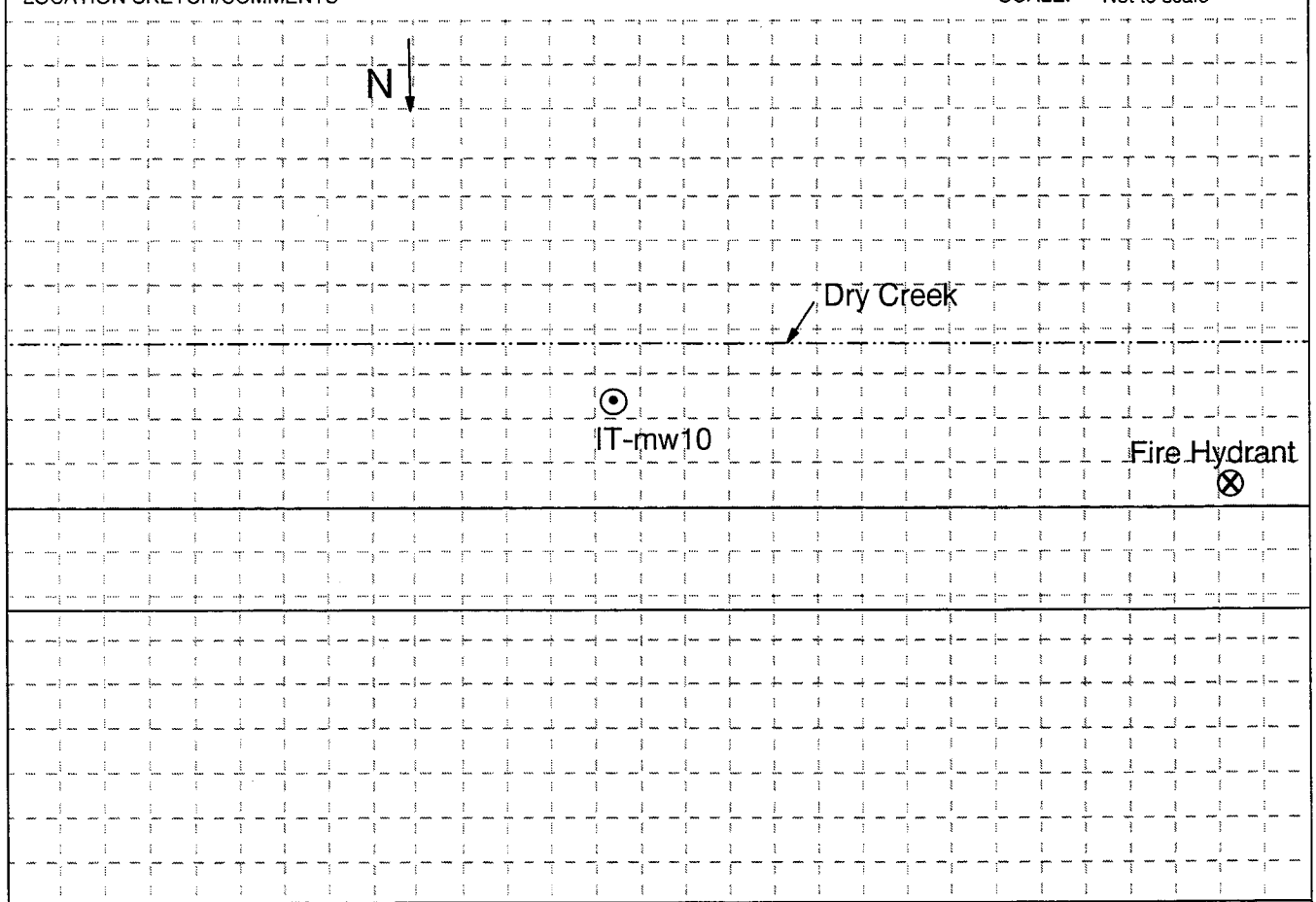
DISTRICT: Nashville		HOLE NUMBER: IT-MW10
1. COMPANY NAME: IT Corporation	2. DRILL SUBCONTRACTOR: Alliance	SHEET 1 OF 3 SHEETS
3. PROJECT: PBOW	4. LOCATION: Erie County, Ohio	
5. NAME OF DRILLER: Paul D. McAdams	6. MANUFACTURER'S DESIGNATION OF DRILL: Dietrich D-50	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" Split Spoons, 8-1/2" O.D. Augers	8. HOLE LOCATION: Northwest of Redwater Pond	
	9. SURFACE ELEVATION: 642.51 feet (MSL)	
	10. DATE STARTED: 9/26/96	11. DATE COMPLETED: 9/27/96
12. OVERBURDEN THICKNESS: 19.5 ft.	15. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: 0.5 ft.	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 17.9 ft./5 days	
14. TOTAL DEPTH OF HOLE: 20.0 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
X	X		

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
NA				Pest/PCBs	Nitro	NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X		Wesley White/

LOCATION SKETCH/COMMENTS — SCALE: Not to scale



PROJECT	HOLE NO.
PBOW	IT-MW10

INTERNATIONAL TECHNOLOGY CORPORATION

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NO. IT-MW10

PROJECT: PBOW | INSPECTOR: W. White | SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	USCS f	BLOW COUNTS g	REMARKS h
	1	Firm, dark gray (10 YR 4/1) mottled with pale brown (10 YR 6/3) silty CLAY, medium plasticity, moist, roots	0.0	S-1	CL	1,3 3,5	
	2	Hard, very pale brown (10 YR 7/4), clayey SILT, low to medium plasticity, moderately low dry strength, dry to moist (below plastic limit)	0.0	S-2	ML	4,4 5,6	
	4	Firm, very pale brown (10 YR 7/3) clayey SILT to SILT, low plasticity, low dry strength, dry	0.0	S-3 Geotechnical Sample		7,8 11,15	
	6	Firm to soft, gray (10 YR 5/1), interbedded silty CLAY and SILT, medium to low plasticity, silts are dilatent, silty clays are moist to wet, silts are moist to dry	0.0	S-4	ML/CL	5,6 7,9	
	8	Silts are becoming moist to wet Fewer clay beds (predominant silts)	0.0	S-5	ML	3,3 4,4	
	10						

Project: PBOW | Hole No. IT-MW10

INTERNATIONAL TECHNOLOGY CORPORATION

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NO. IT-MW10

PROJECT: PBOW | INSPECTOR: W. White | SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	USCS f	BLOW COUNTS g	REMARKS h
	10						
	11		0.0	S-6		3,2 3,4	
	12						
	13		0.0	S-7	ML	1,3 4,4	
	14						
	15		0.0	S-8 Geotechnical Sample		1,3 3,3	
	16						
	17		0.0	S-9 Geotechnical Sample		2,3 3,4	
	18	Hard, dark bluish gray (5PB 4/1) clayey SILT, trace gravel and sand, low to medium plasticity, moist to dry, limestone float					
	19	19.5	0.0	S-10	ML	8,11 50, 50=1/2"	
		Limestone 20.0					
	20						

Project: PBOW | Hole No. IT-MW10

INTERNATIONAL TECHNOLOGY CORPORATION

ALLIANCE
ENVIRONMENTAL, INC.

10/29/96

IT Corporation
312 Directors Drive
Knoxville, TN 37923

Attention: Mr. Wesley White

RE: ***Laboratory Results for Plum Brook Ordnance Works***

Dear Mr. White:

Enclosed is the laboratory results for the samples submitted for the above referenced project.

If we can help you with your drilling needs or you need additional information just give a call. I can be reached either at 1.614.373.2190 extension 128.

Sincerely,

ALLIANCE ENVIRONMENTAL, INC.

Paul D. McAdams, CWD
Project Manager

enclosures
Laboratory Results

117 INDUSTRY ROAD, MARIETTA, OHIO USA 45750 9355 TELEPHONE: 1.614.373.2190 TELEFAX: 1.614.373.5003

Goyle
Engineering, Inc.
115 Rauch Drive, Marietta
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RECEIVED
OCT 28 1996

October 25, 1996

Job No: 96-186

Client: Alliance Environmental, Inc.

Laboratory Soil Testing

Test Boring No. MW-6:

Depth	%Moisture	Soil Description(Classification)
4'-6'	17.9	Very moist, brown sandy silt (Non-Plastic) Can not be rolled into 1/8" thread(-#40)
14'-16'	25.6	Very moist gray clayey silt, silty clay CL-ML, LL = 26.1, PL = 20.4, PI = 5.7
16'-18'	27.1	Very moist, gray, silty clay, clayey silt CL-ML, LL = 27.2, PL = 20.5, PI = 6.7

Test Boring No. MW-8:

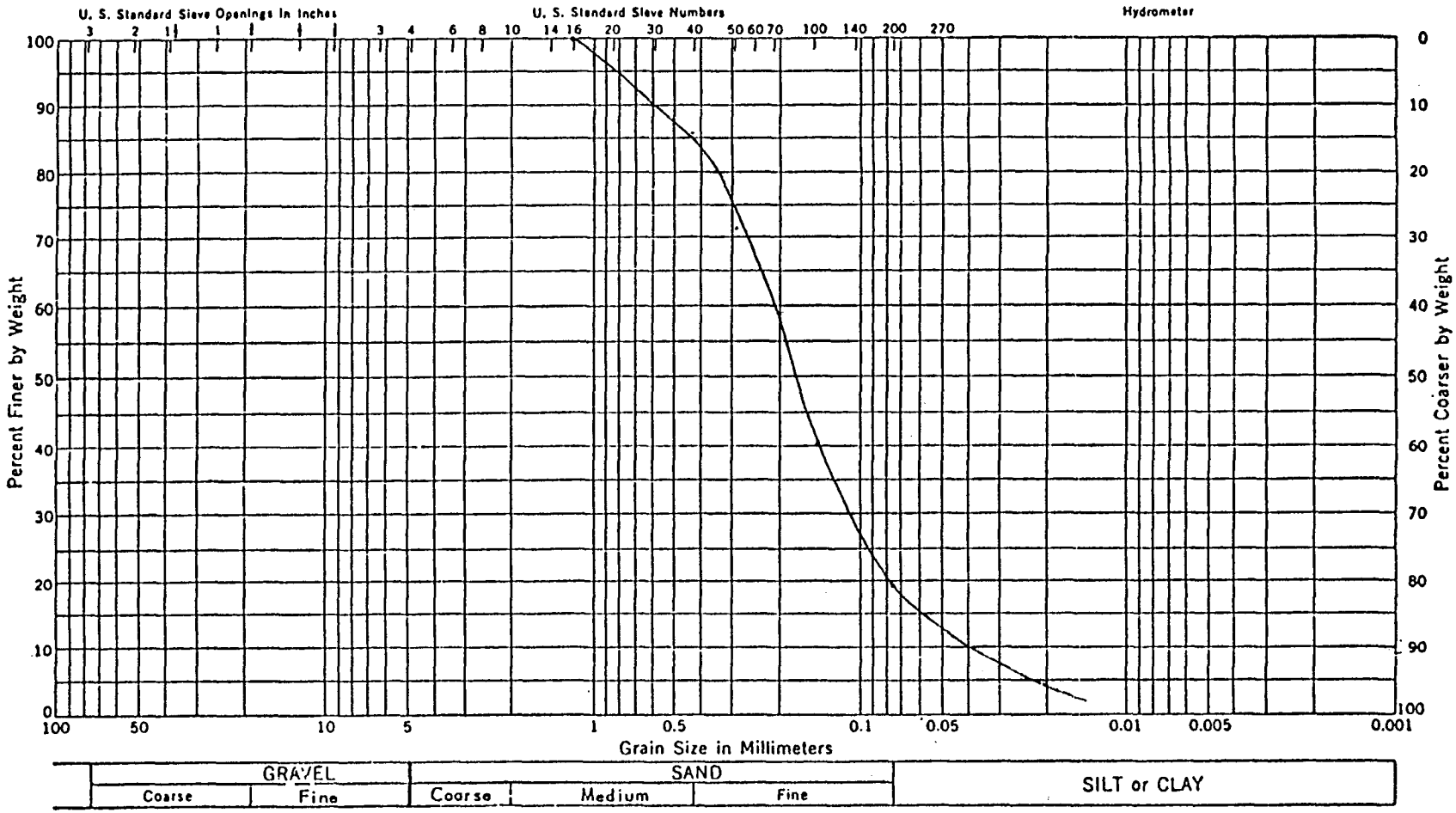
2'-4'	14.4	Moist, brown sandy, clayey silt SM-ML, LL = 24.8, PL = 21.1, PI = 3.7
4.2'-5.7'	11.8	Moist, brown silty sand (Non-Plastic)
6'-8'	28.4	Very moist, gray clayey silt ML, LL = 43.6, PL = 27.2, PI = 16.4

Test Boring No. MW-9:

2'-4'	16.3	Moist, brown clayey silt ML, LL = 34.2, PL = 24.1, PI = 10.1
4'-6'	13.4	Moist, brown silty clay CL, LL = 34.1, PL = 23.2, PI = 10.9
6'-8'	11.2	Moist, brown silty clay CL, LL = 30.9, PL = 20.3, PI = 10.6

C:\SOIL4\ALLIANCE.96

Note: Sample received October 16, 1996



HOLE NO.	SAMPLE NO.	DEPTH	M.C		CLASSIFICATION
MW-8		4.2'-5.7'	11.8%		Moist, brown silty sand
					"SM"

Client: Alliance Environmental, Inc.

Job No: 96-186

Project: Laboratory Soil Testing

Goyle Engineering, Inc.

October, 1996

APPENDIX B

PHOTOGRAPHS AND WELL DEVELOPMENT LOGS

WELL DEVELOPMENT LOG

WELL No.: IT MW6 | PAGE: 1 of 1

Project Name: PBOW | Site: Plum brook
Project No.: 766952 | Client/Project: USACE Nashville
Contractor: IT Corporation | Dev. Contr.: IT | Csg Dia.:
Date/Time Start: 10/4/96 | Date/Time End: 10/4/96 | Dev. Rig(Y/N): No

Development Method: Surge + bail
Equipment: bailer
Pre-Dev. SWL: 20.34 | Maximum drawdown during pumping: at gpm.
Range and Average discharge rate: gpm.
Total quantity of material bailed: 1.5 gallons
Total quantity of water discharged by pumping:
Disposition of discharge water: Drumed

Documented by: W. White
Assisted by:

TIME military	WATER LEVEL (btoc)	VOLUME REMOVED (gal)	TURB. (NTU)	CLARITY COLOR	TEMP deg C	pH	COND. (umhos/cm)	REMARKS
1650	20.34	0	479	brown	11.1	7.77	0.93	
1700	21.93	1.5	999	brown	10.6	7.47	0.94	

COMMENTS:

FIELD FORM

WLDEVLG

WELL DEVELOPMENT LOG

WELL No.: IT-MW8 | PAGE: 1 of 1

Project Name: PBOW | Site: Plum brook
Project No.: 766952 | Client/Project: USACE Nashville
Contractor: IT Corporation | Dev. Contr.: Alliance | Csg Dia.:
Date/Time Start: / / | Date/Time End: 10/4 96 1115 | Dev. Rig(Y/N): Yes

Development Method: Pump + Surge
Equipment: Whale pump
Pre-Dev. SWL: 11.80 | Maximum drawdown during pumping: went dry several times at gpm.
Range and Average discharge rate: gpm. | Documented by: W. White
Total quantity of material bailed: ~~68 gallons~~ | Assisted by:
Total quantity of water discharged by pumping: 68 gallons
Disposition of discharge water: Drumed

TIME military	WATER LEVEL (btoc)	VOLUME REMOVED (gal)	TURB. (NTU)	CLARITY COLOR	TEMP deg C	pH	COND. (umhos/cm)	REMARKS
1050	13.75	55	999	Milky White	12.2	6.66	1.84	* See comments
1100	15.31	60	999	"	12.1	6.69	1.81	
1105	15.27	63	110	cloudy	11.9	6.61	1.82	
1110	15.13	65	51	clear	12.0	6.54	1.82	
1115	15.07	68	15	clear	12.0	6.52	1.83	well almost dry - collect sample

COMMENTS: Drillers knew that ~~was~~ needed to develop MW8, Administration paperwork, Surveyors arrived and setting up soil borings tied me up in the early morning. Drillers started development without me on their own accord. They did do a good job as on 10/2/96 The water level indicator had a coating of ~~th~~ fine silt after sounding the well. Today no silt when sounding the well and the water cleared up quickly.

FIELD FORM | WLDEVLG

WELL DEVELOPMENT LOG

WELL No.: IT MW9 | PAGE: 1 of 1

Project Name: PBDW | Site: Plum brook
Project No.: 766552 | Client/Project: USACE Nashville
Contractor: IT Corporation | Dev. Contr.: IT | Csg Dia.:
Date/Time Start: 10/4/96 1540 | Date/Time End: 10/4/96 1600 | Dev. Rig(Y/N): No

Development Method: Bail + Surge
Equipment: Bailer
Pre-Dev. SWL: 15.37 | Maximum drawdown during pumping: at gpm.
Range and Average discharge rate: gpm.
Total quantity of material bailed: 1/2 gallon
Total quantity of water discharged by pumping:
Disposition of discharge water: Drumed

Documented by: W. White
Assisted by:

TIME military	WATER LEVEL (btoc)	VOLUME REMOVED (gal)	TURB. (NTU)	CLARITY COLOR	TEMP deg C	pH	COND. (umhos/cm)	REMARKS
1545	15.37	0	165	H brown	14.8	7.22	1.68	
1600	16.47	1/2	190	"	14.1	7.35	2.39	well went dry

COMMENTS:

FIELD FORM

WLDEVLO

FIGURE 4 - 13

APPENDIX C

LAND SURVEY DATA

NEW MONITORING WELLS (NASA PBS COORDINATES)

PT #	Y	X	ELEV	WELL #
252	29982.500	13987.892	632.640	MW7GND
251	29982.504	13987.790	635.350	MW7CAS
227	30437.005	15248.293	630.920	MW8GND
228	30435.170	15247.906	633.480	MW8CAS
233	28884.946	14852.186	645.720	MW9GND
234	28882.831	14852.220	647.770	MW9CAS
248	30926.420	13587.695	642.510	MW10GND
246	30924.244	13587.828	645.120	MW10CAS

NEW MONITORING WELLS (OHIO STATE COORDINATES)

PT #	Y	X	ELEVATION (ground)	ELEVATION (casing)	WELL #
251	622075.676	1909861.839	632.300	635.030	IT-MW7*
225	622497.939	1911132.383	630.600	633.160	IT-MW8
231	620955.600	1910699.468	645.400	647.450	IT-MW9
245	623026.644	1909484.655	642.200	644.800	IT-MW10

* - temporary piezometer

EXISTING MONITORING WELLS (OHIO STATE COORDINATES)

PT #	Y	X	ELEVATION	WELL	POSITION
1100	624339.440	1923776.407	637.730	MK-MW22	CAS
1101	624339.661	1923775.783	635.240	MK-MW22	GND
1102	624656.620	1925353.648	639.110	MK-MW23	CAS
1103	624655.534	1925353.894	636.630	MK-MW23	GND
1104	622263.851	1923302.327	656.800	MK-MW24	CAS
1105	622264.944	1923301.968	654.120	MK-MW24	GND
1106	623863.520	1923399.445	639.860	PB-TNTA-MW10	CAS
1107	623861.382	1923398.533	637.180	PB-TNTA-MW10	GND
1108	623517.575	1922744.173	640.180	PB-TNTA-MW11	CAS
1109	623515.418	1922744.065	637.540	PB-TNTA-MW11	GND
1200	616833.696	1918010.497	674.000	MK-MW16	CAS
1201	616834.747	1918009.976	671.010	MK-MW16	GND
1202	618572.482	1917812.572	664.320	MK-MW17	CAS
1203	618572.092	1917811.385	660.650	MK-MW17	GND
1300	621464.997	1911390.720	645.090	PB-TNTC-MW3	CAS
1301	621465.147	1911392.442	642.250	PB-TNTC-MW3	GND
1302	620412.716	1910470.087	654.110	PB-TNTC-MW4	CAS
1303	620410.329	1910469.141	651.570	PB-TNTC-MW4	GND
1304	620691.637	1911811.188	651.490	PB-TNTC-MW5	CAS
1305	620691.916	1911813.344	648.750	PB-TNTC-MW5	GND
1306	620428.714	1913006.304	659.080	PB-TNTC-MW6	CAS
1307	620430.320	1913004.737	656.500	PB-TNTC-MW6	GND
1400	622512.007	1910264.705	639.280	IT-MW002	CAS
1401	622511.675	1910264.431	636.370	IT-MW002	GND
1402	622511.924	1910264.557	639.310	IT-MW002	MEASU.
1403	623859.687	1910564.322	640.570	MK-MW10	CAS
1404	623860.782	1910563.734	637.740	MK-MW10	GND
1405	623859.687	1910564.322	637.360	MK-MW11	CAS
1406	623828.580	1911843.397	634.390	MK-MW11	GND
1407	622640.734	1909947.711	644.110	PB-WA-MW-1	CAS
1408	622640.619	1909948.210	642.000	PB-WA-MW-1	GND
1409	622123.895	1910176.458	633.330	PB-WA-MW-2	CAS
1410	622124.533	1910176.535	630.840	PB-WA-MW-2	GND
1500	624996.059	1919020.828	633.670	PB-PR-MW7	CAS
1501	624995.842	1919020.879	631.180	PB-PR-MW7	GND
1502	624888.805	1919308.729	634.700	PB-PR-MW8	CAS
1503	624888.942	1919308.382	632.180	PB-PR-MW8	GND
1504	625091.706	1919510.083	633.380	PB-PR-MW9	CAS
1505	625089.087	1919513.212	630.380	PB-PR-MW9	GND
1506	625345.617	1919475.123	634.670	IT-MW05	CAS
1507	625344.046	1919473.379	631.590	IT-MW05	GND
1600	621044.151	1912174.521	647.950	PB-BED-MW13	CAS
1601	621042.117	1912174.539	645.490	PB-BED-MW13	GND

1602	622719.990	1910457.060	645.720	PB-BED-MW14	CAS
1603	622719.740	1910454.570	642.730	PB-BED-MW14	GND
1604	626178.959	1919282.558	631.310	PB-BED-MW15	CAS
1605	626178.892	1919284.779	628.760	PB-BED-MW15	GND
1606	623298.550	1920593.533	635.700	PB-BED-MW16	CAS
1607	623296.570	1920593.727	633.360	PB-BED-MW16	GND
1608	625417.226	1924121.493	629.650	PB-BED-MW17	CAS
1609	625419.121	1924122.212	627.020	PB-BED-MW17	GND
1610	623848.512	1925483.197	651.180	PB-BED-MW18	CAS
1611	623846.215	1925482.960	648.510	PB-BED-MW18	GND
1612	623869.017	1910173.785	642.750	PB-BED-MW19	CAS
1613	623866.980	1910173.474	640.190	PB-BED-MW19	GND
1614	612423.248	1922951.545	676.010	PB-BED-MW20	CAS
1615	612421.674	1922950.501	673.250	PB-BED-MW20	GND
1616	626773.634	1917983.404	629.800	REACTOR1	CAS
1617	626773.771	1917983.396	631.890	REACTOR1	GND
1618	626660.982	1918003.256	630.360	REACTOR2	CAS
1619	626661.200	1918003.208	630.400	REACTOR2	GND
1620	626685.067	1918148.350	630.560	REACTOR3	CAS
1621	626685.072	1918148.453	630.410	REACTOR3	GND
1622	626630.217	1918146.484	630.830	REACTOR4	CAS
1623	626630.259	1918146.510	630.440	REACTOR4	GND

Resurveyed. Correct elevations in 6/99 Site-wide Groundwater Monitoring Reports, Final

EXISTING MONITORING WELLS (NASA PBS COORDINATES)

PT #	Y	X	ELEVATION	WELL	POSITION
1000	32580.157	27844.966	638.050	MK-MW22	CAS
1001	32580.363	27844.337	635.560	MK-MW22	GND
1002	32935.171	29414.244	639.430	MK-MW23	CAS
1003	32934.091	29414.516	636.950	MK-MW23	GND
1004	30493.623	27420.866	657.120	MK-MW24	CAS
1005	30494.707	27420.481	654.440	MK-MW24	GND
1006	32095.281	27479.522	640.180	PB-TNTA-MW10	CAS
1007	32093.121	27478.661	637.500	PB-TNTA-MW10	GND
1008	31733.664	26832.705	640.500	PB-TNTA-MW11	CAS
1009	31731.505	26832.648	937.860	PB-TNTA-MW11	GND
2000	24937.473	22260.669	674.320	MK-MW16	CAS
2001	24938.512	22260.123	671.330	MK-MW16	GND
2002	26671.128	22021.002	664.640	MK-MW17	CAS
2003	26670.709	22019.825	660.970	MK-MW17	GND
3000	29408.697	15531.026	645.410	PB-TNTC-MW3	CAS
3001	29408.888	15532.745	642.570	PB-TNTC-MW3	GND
3002	28334.519	14635.879	654.430	PB-TNTC-MW4	CAS
3003	28332.110	14634.991	651.890	PB-TNTC-MW4	GND
3004	28645.608	15969.988	651.810	PB-TNTC-MW5	CAS
3005	28645.938	15972.137	649.070	PB-TNTC-MW5	GND
3006	28411.461	17171.165	659.400	PB-TNTC-MW6	CAS
3007	28413.029	17169.559	656.820	PB-TNTC-MW6	GND

4000	30428.422	14380.094	639.600	IT-MW002	CAS
4001	30428.083	14379.828	636.690	IT-MW002	GND
4002	30428.335	14379.948	639.630	IT-MW002	MEASU.P
4003	31783.011	14647.261	640.890	MK-MW10	CAS
4004	31784.092	14646.646	638.060	MK-MW10	GND
4005	31783.011	14647.261	637.680	MK-MW11	CAS
4006	31782.648	15926.807	634.710	MK-MW11	GND
4007	30549.503	14060.075	644.430	PB-WA-MW-1	CAS
4008	30549.400	14060.577	642.320	PB-WA-MW-1	GND
4009	30038.273	14301.193	633.650	PB-WA-MW-2	CAS
4010	30038.913	14301.254	631.160	PB-WA-MW-2	GND
5000	33122.354	23074.634	633.990	PB-PR-MW7	CAS
5001	33122.138	23074.690	631.500	PB-PR-MW7	GND
5002	33022.042	23365.050	635.020	PB-PR-MW8	CAS
5003	33022.170	23364.700	632.500	PB-PR-MW8	GND
5004	33229.738	23561.485	633.700	PB-PR-MW9	CAS
5005	33227.194	23564.676	630.700	PB-PR-MW9	GND
5006	33482.754	23520.431	634.990	IT-MW05	CAS
5007	33481.141	23518.725	631.910	IT-MW05	GND
6000	29006.777	16324.772	648.270	PB-BED-MW13	CAS
6001	29004.744	16324.838	645.810	PB-BED-MW13	GND
6002	30640.982	14567.410	646.040	PB-BED-MW14	CAS
6003	30640.673	14564.926	643.050	PB-BED-MW14	GND
6004	34311.288	23307.881	631.630	PB-BED-MW15	CAS
6005	34311.275	23310.104	629.080	PB-BED-MW15	GND
6006	31463.005	24687.792	636.020	PB-BED-MW16	CAS
6007	31461.030	24688.033	633.680	PB-BED-MW16	GND
6008	33666.003	28164.077	629.970	PB-BED-MW17	CAS
6009	33667.915	28164.751	627.340	PB-BED-MW17	GND
6010	32130.350	29563.185	651.500	PB-BED-MW18	CAS
6011	32128.048	29563.003	648.830	PB-BED-MW18	GND
6012	31782.954	14256.584	643.070	PB-BED-MW19	CAS
6013	31780.910	14256.322	640.510	PB-BED-MW19	GND
6014	20646.714	27306.637	676.330	PB-BED-MW20	CAS
6015	20645.115	27305.631	673.570	PB-BED-MW20	GND
6016	34874.615	21994.717	630.120	REACTOR1	CAS
6017	34874.752	21994.706	632.210	REACTOR1	GND
6018	34762.465	22017.272	630.680	REACTOR2	CAS
6019	34762.682	22017.219	630.720	REACTOR2	GND
6020	34790.031	22161.756	630.880	REACTOR3	CAS
6021	34790.039	22161.859	630.730	REACTOR3	GND
6022	34735.148	22161.209	631.150	REACTOR4	CAS
6023	34735.191	22161.233	630.760	REACTOR4	GND

APPENDIX D

DATA QUALITY EVALUATION

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List of Acronyms

AR/COC	Analysis Request/Chain of Custody
CLP	Contract Laboratory Program
DCB	decachlorobiphenyl
DQE	data quality evaluation
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ER	equipment rinsate
LCS	laboratory control sample
µg/L	micrograms per liter
MDL	method detection limit
MS/MSD	matrix spike/matrix spike duplicate
PCB	polychlorinated biphenyl
PQL	practical quantitation limit
QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RPD	relative percent difference
SAP	sampling and analysis plan
TAL	target analyte list
TCL	target compound list

Appendix D

Data Quality Evaluation
Plum Brook Ordnance Works
Groundwater Investigation

D.1.0 Introduction

This appendix of the Plum Brook Ordnance Works groundwater investigation report presents the results of the quality assurance/quality control (QA/QC) protocols implemented during the sampling and analysis portion of the groundwater investigation of the former Plum Brook Ordnance Works in Sandusky, Ohio. The quality indicators from every aspect of the data collection process have been reviewed, and an assessment of the data with regard to the project specific objectives is presented. The reliability of the sampling and analytical procedures used during the investigations was demonstrated by implementing the project-specific QA procedures specified in the sitewide sampling and analysis plan (SAP) and QA quality assurance project plan (QAPP) and its site-specific attachments. Successful execution of these procedures provides strong supporting evidence for the acceptance of the data as being representative of the area under investigation. A complete evaluation of the procedures implemented in the investigations are summarized in this data quality evaluation (DQE).

The DQE for the Plum Brook groundwater investigation was divided into two phases. The first phase includes the discussion of the overall field sampling effort and the field QC activities employed. The resulting QC data were presented and compared to the procedures and goals established in the SAP and QAPP, as well as the verification of the completeness, accuracy, and representativeness of the field sampling. The second phase deals with the analytical program and the results of the QC activities employed. An overall comparison to data quality objectives (DQO) was performed as well as a complete data review. All elements of data evaluation were compiled and used to determine the usability and overall applicability of the resulting data.

D.2.0 Field Sampling Program

Field Quality Control Activities. To ensure the reliability of the field sampling procedures, and analytical data, field QA/QC samples were collected or prepared for each medium sampled,

each sample shipment and/or each sampling event. These QA/QC samples are then used to address any sample variability and uncertainty in procedures.

D.2.1 Field Duplicates

The purpose of the field duplicate is to generate data used to evaluate the precision of the sample collection, handling and analysis procedures. As required by the SAP, a field duplicate was collected for every ten groundwater samples collected. Field duplicate samples were collected from the following monitoring well locations: IT-MW02, BED-MW19, and MK-MW17.

Variations are evaluated using the precision data which are measured by calculating the relative percent difference (RPD) between the original sample results and its duplicate results. Higher RPDs are thought to reflect difficulties often encountered during the collection of duplicate samples or sample handling.

All positive concentrations and the calculated RPD for the original sample and/or its duplicate are presented in Tables D-1 to D-3. The RPD results were calculated as follows:

$$RPD = \frac{A - B}{[(A + B)/2]} 100$$

where:

RPD = Relative percent difference
A = Original sample result
B = Duplicate sample result.

When concentrations are detected in only one of the two samples, "NC" is used to represent the RPD, which is then "not calculable" for the parameter. There is no quantifiable result available from the "nondetect" sample to be used in the RPD calculation. When "estimated" (J qualified) concentrations are reported, there is a greater potential for increased variability between the primary and duplicate results, as reflected in the RPD calculation.

The groundwater samples and the respective duplicates exhibited low levels of various organic constituents and numerous metals. All RPD results fell within acceptable limits (20 percent), demonstrating good sampling precision with the exception of a few noted outliers. A common

variation trend was noted for the various low-level volatile organics detected in the samples. The concentrations were detected at or below the laboratory reporting limit, which resulted in higher RPDs, as previously discussed. The actual differences seen are negligible at the concentrations reported. The duplicate results for the sample collected from IT-MW02 (5310 and 5311-FD) showed good precision in the metals analysis, with the exception of total aluminum (37.1 percent), dissolved lead (82.6 percent), and dissolved zinc (81.2 percent). The associated data were qualified as estimated based on these noted variations. The explosives analysis also exhibited similar outliers at the following levels: 1,3-dinitrobenzene (44.9 percent), 2,4-dinitrotoluene (42.4 percent), and 1,3,5-trinitrobenzene (87.4 percent). It should be noted that matrix interferences were encountered during this analysis, which may have affected the quantification of these compounds. The variations seen may not be indicative of poor performance in the sampling procedures employed. Precision data collected from monitoring well BED-MW19 (5220 and 5221-FD) exhibited similar low-level volatile concentrations that were reported below the reporting limit for the compounds. Total chromium exhibited an RPD of 25.3 percent and the only other outlier was noted in the explosives analysis, nitrobenzene (24.7 percent). Metals and explosives variations were also noted in the precision data for monitoring well MKMW17. The RPD for total nickel was reported at 22.7 percent, dissolved arsenic at 122 percent, dissolved iron at 68.9 percent, and dissolved zinc at 53.8 percent. 2,4-Dinitrotoluene and 4-amino-2,6-dinitrotoluene were reported with RPDs of 52.9 percent and 65.6 percent, respectively. Compounds that were reported as "NC" for the RPD were found to be reported just above or below the reporting limit established for the parameter. All remaining reported concentrations compared very well, demonstrating good precision in the sample collection process. All associated data were qualified accordingly in the data validation process.

D.2.2 Trip Blanks

Samples collected for volatile organics analysis are susceptible to contamination by diffusion of organic compounds into the sample container. Trip blanks were analyzed as part of the QA/QC program to monitor possible sample contamination during the sample shipment and laboratory storage process. The trip blanks were prepared by adding analyte-free water to volatile organic compound vials in the laboratory and shipped to the site accompanying the sample containers to be used in the sample collection process. They remained sealed during storage and shipment and were analyzed with the collected environmental samples.

The trip blank data are used in the validation process of the volatile organics analytical results. The data are associated according to the date shipped to the laboratory. The trip blanks collected

for the groundwater investigation exhibited concentrations of methylene chloride and chloroform, which were also qualified by the laboratory as being a result of possible laboratory contamination. Similar concentrations also detected in the associated laboratory method blanks. No apparent problems were encountered with shipment and/or storage contamination, as indicated by the trip blank results.

D.2.3 Equipment Rinse Blanks

Equipment rinses (ER) are used to assess the effectiveness of the equipment decontamination procedures employed and the potential of cross contamination of environmental samples between sampling locations. The rinsates are collected by passing clean, analyte-free water through and over the sampling equipment after the decontamination procedures have been executed. ERs were collected daily for the groundwater investigation. The blanks were analyzed for the same analytical parameters as the associated environmental samples collected.

The analytical results exhibited some low-level concentrations of volatiles, semivolatiles and metals. Volatile organics, such as carbon disulfide (4.2 micrograms per liter [μg/L]) and chloroform (1.1, 1.5, and 1.2 μg/L), were reported in the rinsates. The semivolatile that was reported was a phthalate ester compound, bis(2-ethylhexyl)phthalate, reported at an estimated concentration of 2.6 μg/L, which is below the laboratory's reporting limit. The metals that were reported included lead (6.5 and 3.3 μg/L) and zinc (61.9, 38.2 and 83.2 μg/L). All parameters reported are often identified as laboratory process contamination and should not be indicative of inefficiencies in the decontamination process employed.

The ER data were used in the validation process by applying the "5X/10X Rule" and associated results were qualified accordingly.

D.2.4 Field Blanks

Field blanks were prepared from clean water used in the decontamination procedures employed. Analysis of the blanks ensures that all water sources used during decontamination are free of parameters of interest. A field blank was collected from the source water (potable) used for steam-cleaning sampling equipment and the final decontamination rinse water. Only one lot number of the deionized final rinse water was used; therefore, two field blanks (potable and non-potable) were submitted for analysis and tested for all parameters analyzed in this investigation.

The potable water sample used in the steam-cleaning portion of the decontamination process exhibited low-level concentrations of volatiles and metals. The volatiles detected included chloroform (15B µg/L), bromodichloromethane (4.3 µg/L), and dibromochloromethane (1.4J µg/L). The concentrations reported are indicative of those present in potable water (trihalomethanes). Calcium (45,500 µg/L), copper (78.6 µg/L), magnesium (11,900 µg/L), sodium (16,700 µg/L), and zinc (31.1 µg/L) were detected in the potable water field blank at concentrations expected for nutritional elements.

The nonpotable, analyte-free water used in the final rinse of the sampling equipment exhibited zinc at a concentration of 27.6 µg/L. Review of the associated field sample data suggest that this concentration may be a result of laboratory process contamination and should not be considered native to the water source being evaluated.

No systematic problems or data effects with respect to usability and application are indicated in the field blank results.

D.3.0 Analytical Program

The analytical program determined, with documented precision and accuracy, if specific compounds were present in the groundwater samples collected from the area investigated. Chemical analyses for the investigation were performed in accordance with the guidelines prescribed by the U.S. Environmental Protection Agency (EPA) *Test Methods for Evaluating Solid Waste (SW-846), Physical/Chemical Methods*, Third Edition, September 1986 and subsequent revisions. The groundwater samples and associated QA/QC samples were analyzed for volatile organics, semivolatile organics, pesticides/polychlorinated biphenyls (PCB), metals and a specific list of nitroaromatics and nitroamines using the methods presented in Table D-4. Each sample collected was analyzed for the full suite of parameters.

All analytical samples collected for the generation of definitive data were reported in EPA Level IV Contract Laboratory Program (CLP)-like data packages and a Level III data validation was performed using EPA validation guidelines. The regulatory compound/analyte list reported was the target compound list (TCL) for organics and the target analyte list (TAL) for inorganics. These data packages have also been reviewed for completeness and compliance to the approved final work plan (IT, 1996). All samples were submitted to the laboratory accompanied by an Analysis Request/Chain of Custody (AR/COC) form. The RFA portion of the form provides

Table D-4

Summary of Analytical Parameters and Methodologies for Groundwater Samples
Groundwater Investigation
Plum Brook Ordnance Works, Sandusky, Ohio

Analytical Parameters	Analytical Method
TCL Volatile Organic Compounds	EPA SW-846 8260A[a]
TCL Semivolatile Organic Compounds	EPA SW-846 3541/8270B[a]
TAL Total Metals	SW-846
TAL Dissolved Metals	3050A/6010A[b] for Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn 7471A[a] for Hg
Pesticides/PCBs	EPA SW-846 3520B/8081
Nitroaromatic Compounds	EPA SW-846 8330[c]
Total Cyanide	EPA SW-846 9013/9010A

[a] Test Method for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition, Update II, September 1994.

[b] Test Method for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition, Update I, July 1992.

[c] Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition, Revision 1, December 1990.

TAL = Target analyte list.
TCL = Target compound list.

project specific analytical specifications and QC instruction to the laboratories. A formal COC traceability record was included as part of the document, ensuring documentation of custody for sample transportation, storage and eventual disposition by the laboratory. Copies of all custody documentation are included in the data packages submitted. All samples were received at the laboratory within the 4 (plus or minus 2) degrees Celsius guidelines with custody seals intact.

D.3.1 QA/QC Procedures

The project QA/QC program described in the SAP and QAPP was followed for the sample collection and laboratory analysis of samples. The elements of this program are discussed in the sections that follow. The laboratory analytical program consisted of EPA SW-846 methods with Level IV deliverables for the generation of definitive data for the investigation. Deliverables included sample preparation information; calibration records; QC data such as method blanks, spikes, duplicates, surrogate recoveries, internal standards; and copies of the RFA and COC records. Chemical analyses for this project were performed following standardized protocols, which include specific requirements for how compounds are analyzed, identified and reported.

Each of the methods employed included specific QA/QC protocols that are used to support the validity of the sampling event and the resulting data. These QA/QC protocols are a critical part of the analytical method and were followed explicitly during sample analysis. Specific measures included detailed record keeping procedures, analysis of duplicate samples, instrument calibrations, and the analyses of blanks, surrogate and internal standards.

D.3.1.1 Reporting Limits

Practical quantitation limits (PQL), the laboratories' statistically determined reporting limits, were presented in the QAPP section of the final work plan for the investigation for the Quanterra laboratory in Knoxville, Tennessee. The analytical program executed required the use of SW-846 methods that specify the procedures for calculating the PQLs presented. Each laboratory is required to demonstrate method performance through method detection limit (MDL) studies for every analysis performed, each instrument and each matrix. These studies are required to be laboratory specific so that individual laboratory variables such as equipment brands, reagent suppliers, chemist technique, etc. are all factored into the performance study. The PQL is statistically supported by the MDL established. The PQL calculation is designed to use the MDL, established using controlled matrices (i.e., distilled water), and adjusts the limit by a predetermined mathematical factor for the analysis of actual environmental sample matrices (i.e., soil, groundwater, etc.). For purposes of clarity and consistency with respect to definition and

terminology, the term "reporting limit" has been substituted for PQL when referencing the limit of detection to which the laboratory reported for each individual sample and parameter. This value has been corrected for all necessary dilution and interference factors as applicable based on the resulting analytical data for the sample.

All laboratory results were reviewed with respect to the actual reporting limits achieved as compared to the limits presented in the QAPP. Matrix interferences were frequently encountered in the organics analyses performed resulting in dilutions and elevated reporting limits.

Reporting limits were affected mostly by the dilutions that were necessary to minimize the matrix interference encountered and the high concentrations of target analytes that exceeded the calibration range of the method employed. When dilutions were required due to high concentrations of target analytes, both sets of data were reported in order to provide the lowest possible reporting limit for all analytes of concern.

D.3.1.2 Holding Times

All laboratory results submitted for the Plum Brook groundwater investigation were reviewed with respect to laboratory adherence to analysis holding times. Maximum analytical holding times, as presented in Table 5-1 of the QAPP, were met by the laboratory, with the exception of some reanalyses. All samples were analyzed initially within the designated analytical holding time. Occasionally, the sample results exhibited anomalous QC results thought to be a result of matrix interferences. Reanalyses were required in order to demonstrate the interference or correct the anomaly. Both sets of data were reported for comparison. During the data validation process, these instances were evaluated with respect to data comparability and the reanalyses were rejected in favor of the initial runs. Both sets of data were reported for comparison.

There were no holding time violations that affected final data usability determinations or data applicability with respect to DQOs and the objectives of the investigation.

D.3.1.3 Method Blanks

Method blanks were analyzed with each analytical "batch" processed. The blanks were carried through the analytical procedure, step-by-step, including the addition of all solvents and other reagents required in the analytical process. The purpose of the blank is to ensure that no contaminants are being introduced to the sample as a result of any part of the analytical process, helping to eliminate the element of doubt as to the origin of reported concentrations.

The method blank results reported with the groundwater investigation data were evaluated for high readings characteristic of background or process contamination. There were no significant concentrations detected in the designated blank samples that deem any analytical process out of control or require further corrective action. The methylene chloride, acetone, chloroform, and bis(2-ethylhexyl)phthalate concentrations reported for the method blanks should be attributed to laboratory process contamination. These compounds are common laboratory contaminants. Methylene chloride and acetone are laboratory solvents commonly used for the preparation and extraction of samples for many analyses. Chloroform, a trihalomethane, is frequently detected in drinking water thought to be a by-product of water treatment through the chlorination process. Phthalate esters are often seen in laboratory method or process blanks. They are thought to originate from the extraction portion of the semivolatiles analysis either through the safety gloves that are worn by the extraction technician or other theorized origins.

The laboratory method blank prepared on October 22, 1996 and analyzed November 5, 1996 for the explosives by Method 8330 analysis exhibited concentrations of 1,3-dinitrobenzene and 2,4-dinitrotoluene of 1.4 μg/L and 0.40 μg/L, respectively. Elevated reporting limits due to interferences were also reported for 2,4-dinitrotoluene, 4-amino-2,6-dinitrotoluene, and tetryl. The method blank and all associated environmental samples were re-extracted and reanalyzed exceeding the acceptable holding time for the analysis. The reanalyses confirmed the original data reported for these associated samples was acceptable, demonstrating that the anomalous blank had no affect on the resulting data. The data validation process rejected the reanalysis data in favor of the initial runs, eliminating the holding time issue and providing the data user the best achievable data.

All concentrations thought to be a product of laboratory process contamination based on method blanks results have been qualified (B) accordingly in the reporting process and used in the validation process through the application of the 5X/10X Rule.

All applicable method blank criteria were met for all parameters as specified by the method employed and the QAPP. The analytical data presented in the groundwater investigation report are blank corrected as a function of the data validation process.

D.3.1.4 Laboratory Control Samples

Laboratory control samples (LCS) were used in the analytical program as a measure of accuracy without the influence of matrix on the analysis. The LCS is best described as a spiked laboratory

blank measured and reported by calculating the percent recovery of the known spiked concentrations. An LCS was analyzed with every batch of samples processed and analyzed. The control limits applied were statistically derived by the laboratory as required by the method. The review of all LCS data associated with these groundwater investigation data sets revealed all data to be within the specified control limits demonstrating accuracy within all analytical processes employed.

D.3.1.5 Matrix Spike\Matrix Spike Duplicates

Matrix spikes (MS) are used to provide an indication of bias due to matrix effects and a measure of accuracy of associated results. Duplicate analyses, sometimes performed using a matrix spike duplicate (MSD) in the case of organics analyses, provide a measure of precision in the analytical process. An MS/MSD pair was analyzed for at least every 20 field samples collected for the groundwater investigation. Samples collected from monitoring wells WA-MW2 (5120), BED-MW19 (5220) and PR-MW7 (5130) were submitted for MS/MSD analysis. The observed percent recovery of the spikes was used to determine accuracy for the analyses. Control limits used to evaluate these recoveries were determined statistically by the laboratory for organics as required by the methods employed. RPD calculations are used to evaluate duplicate sample results, as they are for field duplicate samples. The acceptance criteria for the precision data were statistically determined by the laboratory.

Variations were noted in the pesticide/PCB, metals, and explosives analyses for the MS/MSD collected from WA-MW2. Metals data exhibited anomalies in accuracy data for total aluminum, total and dissolved calcium, total iron, total and dissolved sodium, dissolved magnesium, and dissolved manganese. These recovery anomalies should not be considered indicative of poor method performance due to the high concentrations native to the sample as compared to the spiking levels applied. The acceptable range for accuracy for the project was defined as 80 to 120 percent. Variations were noted in the pesticide analysis in the accuracy results for dichloro-diphenyltrichloroethane and precision and accuracy in the heptachlor recoveries. In these instances, the associated LCS results were within specified control limits and the anomalies were attributed to matrix interferences. A similar effect was noted in the explosives analysis, which exhibited an extraneous interfering peak in the HMX region of the chromatography. The LCS results for the analysis were acceptable; therefore, no further actions were taken.

The precision and accuracy data reported using Sample 5220 from BED-MW19 exhibited anomalies in the semivolatile, pesticide/PCB, metals, and explosives analyses. In the

semivolatile analysis, pentachlorophenol was detected at a recovery of 20 percent in the MSD. The control limits for pentachlorophenol are 25 to 165 percent. Because of the anomalous recovery in the MSD, the RPD for pentachlorophenol was calculated at 72 percent, as expected. The associated LCS results were within established control limits and results were reported as calculated. The pesticide/PCB precision and accuracy results could not be determined. The sample required a 1:50 dilution for analysis; therefore, all spiked concentrations were effectively diluted out of the spiked samples. Similar metals results were noted for BED-MW19 as were exhibited in WA-MW2. All anomalies are attributable to high concentrations of the element native in the sample or the variations seen were only slight, within 5 to 10 percent of the control limits employed. The explosives spike analyses exhibited very low recoveries for 1,3,5-trinitrobenzene (4.3 percent and 4.0 percent), tetryl (0 percent and 6.3 percent) and 2,4,6-trinitrotoluene (6.7 percent and 10 percent). Associated LCS results are within established control limits, indicating the anomalies to be a results of matrix interferences. Associated data were qualified accordingly in the data validation process.

MS/MSD data generated from the sample collected from PRMW7 exhibited anomalous data points in the semivolatile, pesticide/PCB, metals, and explosives analyses. There was no recovery noted in the semivolatile analysis and recoveries for 2,4-dinitrotoluene were reported at 665 percent and 540 percent. Concentrations of 2,4-dinitrotoluene were also reported native to the sample, which would account for the inflated recoveries reported in the MS/MSD. The recoveries reported for the associated LCS were good, which further supports the matrix effect. A 1:20 dilution was required for the pesticide/PCB analysis, and a dilution of 1:1000 was used in the explosives analysis of Sample 5130. All spiked concentrations were diluted out, preventing the calculation of precision and accuracy data for this sample. Associated LCS data were good, demonstrating the process to be in control for the sample analyses. Again, similar metals outliers were noted, exhibiting only slight variations from the acceptance criteria applied.

In summary, for all MS/MSD analyses, the associated LCS data demonstrated the analytical process to be in control and the anomalies were attributed to matrix effects. All associated data were qualified as appropriate in the data validation process.

D.3.1.6 Surrogate Standards

Surrogate standards were used in the analytical program to monitor the percent recovery efficiencies of the sample preparation and analytical procedure on a sample-by-sample basis for organic constituents. The surrogate standards used were those required by the analytical

methodology employed and were compliant with the requirements of the method employed. Control limits for the surrogate recovery were determined statistically by the laboratory as required by the methodology. Evaluation of the surrogate standard data exhibited acceptable results for all volatile, semivolatile, pesticide/PCB, and explosives analyses, with the exception of the following identified deficiencies.

Semivolatile organics analyses exhibited some anomalies in the surrogate standard recoveries, particularly tribromophenol, that were attributed to the matrix interferences. Sample 5221, the field duplicate sample for Sample 5220, exhibited a tribromophenol recovery of 17 percent. The control limits for the surrogate standard are 36 to 144 percent. The recovery in the original sample was 78 percent and data were reported as calculated. Sample 5190 also exhibited a low recovery for tribromophenol of 13 percent. The anomaly was attributed to matrix effects and data reported as generated.

The pesticide/PCB data exhibited a number of variations in the decachlorobiphenyl (DCB) recoveries. Recoveries for the surrogate were consistently reported in the 30 to 60 percent range. The control limits established for DCB are 60 to 150 percent. These anomalies are attributed and do show correlation to the samples exhibiting matrix interferences and the presence of interfering peaks in the resulting chromatography. All recoveries for TCMX were within specified criteria, with the exception of the instances where dilutions effectively diluted out the spiked surrogate standard. Explosives results demonstrated similar problems in surrogate recoveries. All surrogates were within limits for all samples, with the exception of those exhibiting interferences that hinder the quantification of the surrogate or require dilutions that dilute out the concentrations spiked.

No other anomalies were encountered in the surrogate standard data reported. All data were qualified accordingly during the data validation process.

D.4.0 Data Quality Objectives

DQOs are qualitative and quantitative criteria used to guide sample collection and analysis activities. The DQOs for the project were developed at the outset of the investigation to ensure that the data generated during the execution of the analytical program were of appropriate quality to support the anticipated end use of the data. DQOs describe the level of uncertainty that a decision-maker is willing to accept in results derived from the environmental data. This uncer-

tainty is used to the quality of the measurement data, usually in terms of objectives, bias, representativeness, comparability, and completeness. DQOs seek to ensure that the right type, amount, and quality of data are collected to accomplish the objectives of the project.

The DQOs for this project are to produce scientifically valid data of known accuracy and precision, which are complete with respect to identified critical samples, comparable with similar data types, and representative of the media sampled so as to be useful for the cited purposes.

To achieve these DQOs, criteria were established in the QAPP by which these goals could be achieved. The groundwater investigation required that all laboratory analyses be performed and resulting data reported as definitive data. According to EPA/540/G-93/071 "Data Quality Objectives Process for Superfund", the definitive data are generated using rigorous analytical methods, such as approved EPA reference methods. Data are analyte-specific, with confirmation of analyte identity and concentration. Methods produce tangible raw data (e.g., chromatograms, spectra, digital values, etc.) in the form of paper printouts or computer-generated electronic files. Data may be generated at the site or at an off-site location, as long as the QA/QC requirements are satisfied. For the data to be definitive, either analytical or total measurement error must be determined. A non-CLP, (SW-846) method was employed and Level IV (CLP-like) data packages were provided for evaluation for these samples. Definitive data criteria were chosen because compliance with the criteria specified within its guidelines provides quantified concentrations with acceptable reliability for the purposes of the investigation. All reported analytical data met or exceeded the requirements of Level IV QC criteria.

D.5.0 Data Useability

The data review process as presented in this report compares sample results to pre-established criteria to confirm that the data are of acceptable technical quality. Specific criteria were reviewed that verifies the achievement of all precision, accuracy, completeness, comparability, and representativeness goals established to meet the project DQOs. To verify that these objectives were met, field measurements, sampling and handling procedures, laboratory analysis and reporting, and all nonconformances and discrepancies in the data were examined to determine compliance with the appropriate and applicable procedures. The results of this review were presented in previous sections, with all outliers or nonconformances discussed where they occurred.

Precision data were obtained through the analysis and evaluation of duplicate QA samples. Accuracy was determined through the analysis and evaluation of method blanks, laboratory control samples, equipment rinsates, field blanks, and matrix spike samples. These QA samples were collected and/or analyzed at the frequency established in the QAPP, verifying the completeness element of the goals along with the evaluation of holding times and reporting limits.

Completeness is a measure of the amount of valid data that are obtained during a sampling event. There were a number of data points rejected in the evaluation and data validation process. In addition to those previously discussed, there were data points rejected due to the following anomalies:

- The relative response factors for the initial and continuing calibrations for acetone and 2-butanone were below the requirement of 0.05; therefore associated results (nondetects) were qualified as rejected data points.

- Samples 5130, 5150, and 5170 exhibited very low recoveries for the internal standard perylene-d12. Sample 5130 and 5150 data associated to the internal standard were rejected because the recoveries were reported at 0 percent and 2 percent, respectively. The data suggests that any compound associated to the internal standard (di-n-octylphthalate, and some polyaromatic hydrocarbons) may not have been recovered in the analytical process. The samples were not reanalyzed due to the difficult matrix. The initial runs made using these extracts essentially stripped the gas chromatography column and resulted in significant instrument downtime. The data were reported as calculated. Further dilutions would have only resulted in elevated reporting limits.

- The continuing calibration verifications for metals analyses in sample delivery group PB009 exhibited elevated recoveries, which resulted in rejected data for aluminum, antimony, barium, chromium, copper, iron, potassium, manganese, nickel, sodium, and zinc. The method employed does not require reanalysis for the elevated recoveries, but uses functional guidelines for data validation to require data qualification based on these results.

- The "R" qualifier was applied to data when determining the usability between initial runs and reanalyses and/or dilutions performed.

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Comparability ensures that results for the sampling event can be compared with data from other past and/or future sampling programs. Comparability for this sampling event was achieved through the use of established and recognized techniques and accepted standard EPA methods. All samples collected and analyzed were subjected to the same

sampling, handling, preparation, analysis, reporting, and validation criteria for the purpose of achieving comparability goals within the data set.

To verify sample representativeness, field data such as field activity daily logs, sample collection logs, AR/COC forms, field instrument calibrations, and variances were reviewed. The overall results of the analyses as discussed in this evaluation suggest that representative samples were collected and analyzed, with results being indicative of the media analyzed with the exception of the few anomalies noted. Organic chemicals were omitted from consideration if they were a common laboratory contaminant or could be traced to some other source within the analytical investigation process. Overall, the investigation data reflect expected groundwater conditions.

All analytical results for chemicals are reported using laboratory data qualifiers. Chemicals flagged with a "U" qualifier are considered to be not detected, or detected at a concentration below the normal, random "noise" of the analytical instrument. The "J" qualifier describes an estimated value when a compound is qualitatively identified (spectral identification criteria are met), but at values less that the project-required reporting limit.

D.6.0 Conclusions

The goal and objective for the Plum Brook groundwater investigation was to provide additional information concerning groundwater levels and contaminant concentrations in the groundwater. The data are to be used in making management decisions for the necessity of further work at the site. Evaluation of the data using the specific DQOs established for the project and the data validation process resulted in the determination that the data set is valid as a whole and of sufficient quality to meet the objectives of the investigation. There were no significant problems observed that would adversely affect the application of the data or the success of the overall investigation.

APPENDIX E

DATA VALIDATION SUMMARY

Data Validation Summary

The complete validation report will provided upon request. The summary attached describes the process used for validation and a general overall view of the resulting data qualifications. The sample delivery groups are defined as follows:

- PB001- contains groundwater data discussed in the Groundwater Investigation Report.
- PB002- contains soil data from samples collected at the Power House No.2 Ash Pit locations SO01, SO02, SO03, SO04, SO05, SO06, SO07, SO08 and SO09.
- PB003- contains soil data from samples collected at the Power House No.2 Ash Pit locations SO10, SO11 and SO12 and Reservoir No.2 Burning Ground locations SO01, SO02, SO03, SO04, SO05, SO06, SO07 and SO08 .
- PB004- contains groundwater data discussed in the Groundwater Investigation Report.
- PB005- contains soil data from samples collected at the reservoir No.2 Burning Ground locations SO03, SO04, SO05, SO06, SO07 and SO08 and Waste Water Disposal Plant No.2 locations SO01, SO02, SO04, SO05 and SO06.
- PB006- contains soil data from the Waste Water Disposal Plant No.2 locations SO07, SO08 and SO10 and the Additional Burn Ground locations SO01, SO02, SO03, SO04, SO05, SO06, SO07 and SO08.
- PB007- contains soil data from samples collected at the Additional Burn Ground locations SO09, SO10, SO11 and SO12 and Waste Water Disposal Plant No.2 locations SO03 and SO09.
- PB008- contains groundwater data discussed in the Groundwater Investigation Report.
- PB009- contains groundwater data discussed in the Groundwater Investigation Report.

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PLUM BROOK ORDNANCE WORKS
DATA VALIDATION SUMMARY

December 1996
Revised 1/27/97

One-hundred percent (100%) of the sample data from Plum Brook collected in September and October 1996 was validated according to the Level III *National Functional Guidelines for Organic and Inorganic Data Review* or equivalent. Analyses consisted of Volatiles, Semivolatiles, Pesticide/PCBs, Explosives, Metals, Cyanide, and Wet Chemistry.

Analysis of the soil samples, and to a more limited extent, the groundwater samples, revealed severe matrix problems. For the soils, the problems appeared to be related to the high organic content of the soils being analyzed. The effects were manifested by high surrogate recoveries and low internal standard (IS) area count. A subsequent test run by the analytical laboratory of the three soil types from the sampling event confirmed that the soil type with the highest organic content (a dark peat) caused the high surrogate, low IS counts. Data from this test run was provided to the validators for review. The result was a decision to lower the IS count control limits from 50% to 30% for the organic constituents. For the pesticide/PCB analysis the DCB surrogate recovery QC limits established by the laboratory were 60-150%, the validation reviewer choose to add qualifiers only if the recovery was below the 30% limit specified in the EPA guidance document.

Volatiles. Methylene chloride was found in the method blank associated with nineteen samples from PB001, PB002, PB005, and PB006. These samples required that the compound be raised to the CRQL and qualified as nondetect "U". The same is true for chloroform from five samples in PB009.

Toluene was qualified as nondetect "U" in one sample each from PB004 and PB007. Methylene chloride was found in the associated trip blanks in PB001, PB002, PB003 and was qualified as "U" in 14 samples. Acetone, 2-butanone, and 2-hexanone were rejected due to Relative Response Factors (RRFs) <0.05 in the initial and continuing calibration standards in samples in PB001, PB004, PB008, and PB009. Finally, a combination of low IS area counts (<30%) and high surrogates resulted in 29 of the original samples being rejected in favor of the dilution reanalysis in seven of the nine SDGs. Detects in the dilution samples were qualified as estimated, "J". High surrogate recoveries in the original samples resulted in estimated "J" qualifiers being added to those compounds.

Semivolatiles. In PB001 two samples were analyzed outside the instrument tune time resulting in the original samples being rejected and the reanalysis qualified as J for the detected compounds associated with the perylene-IS. One other sample had a perylene-IS at 10% and had all associated compounds qualified as estimated "UJ". Four additional samples from PB003 and PB008 also had low perylene standard counts and were qualified as estimated "UJ". The percent difference in the continuing calibration standard resulted in 3-nitroaniline, benzo(k)fluoranthene, carbazole and 2-methylnaphthalene being qualified as J in one sample from PB001, one sample from PB002, 2 samples from PB006, and 5 samples from PB007, respectively. In PB006 there were 17 samples that had di-n-butyl phthalate raised to the CRQL and qualified as nondetect "U" due to the compound occurring in the associated method blank. Throughout the semivolatile analyses there were a variety of compounds that exceeded the calibration range in the original samples. These were rejected in favor of the value resulting from dilution.

Pesticide/PCBs. In PB001, PB002, and PB003, 20 samples had endrin ketone qualified as estimated "UJ" due to the percent difference in the continuing calibration that exceeded the 25% limit. The same is true for methoxychlor in six samples from PB002, 10 samples from PB008, and 10 samples from PB009; for 4, 4'-DDD in three samples from PB008 and three samples from PB009. In PB005 one sample had all the pesticide compounds qualified as estimated "UJ" due to a TCX surrogate recovery of 19%. Also one sample from PB008 was qualified as estimated "UJ" since both the TCX and DCB surrogates were outside the QC limits.

Explosives. In PB001, sample 5080 was qualified as estimated "UJ" due to low surrogate recovery. One sample in PB008 was qualified as estimated "J" for detects and "UJ" for nondetects due to exceeding acceptable extraction times. In PB008, two samples had 2-nitrotoluene qualified estimated "J" because the presence in the sample and the method blank could not be confirmed since this analyte coelutes with the surrogate on the confirmation column. Five reanalysis samples in PB008 were rejected "R" in favor of their original analyses due to re-extraction outside acceptable holding times. In PB009 3-nitrotoluene in one sample, 2-nitrotoluene in three samples, and 1,3,5-trinitrobenzene in one sample were all qualified as estimated "J" because their presence could not be confirmed since these analytes coelute with the surrogate on the confirmation column. In PB008 1, 3-dinitobenzene was qualified in one sample as nondetect "U" due to contamination in the associated method blank.

Metals. In SDG PB009, a continuing calibration verification sample (CCV5) had extremely high recoveries for iron, manganese, antimony, barium, beryllium, chromium, potassium, nickel, sodium, and zinc. Per requirements in the *National Functional Guidelines for Inorganic Data Review*, associated samples with detects were qualified as unusable "R".

Samples in all SDGs except for SDG PB009 required qualification for at least one analyte due to matrix spike/matrix spike duplicate recoveries which were outside of acceptable control limits (75%-125%). Analytes requiring qualification included aluminum, antimony, chromium, copper, lead, magnesium, manganese, nickel, potassium, silver, sodium, thallium, vanadium, and zinc. In addition, all samples in SDG PB001 were qualified as estimated ("J" for detects, "UJ" for nondetects) for sodium due to poor results in the ICP serial dilution QC analysis.

Several samples in SDGs PB002, PB003, PB006, and PB007 required qualification as nondetect for lead and/or zinc due to contamination in associated equipment rinsate blanks. Several field duplicate pairs also reported significant differences in reported values. Several analytes were reported in one sample and not detected in the duplicate pairs, and several analytes exceeded recommended relative percent difference criteria (50% for water samples, 100% for soil samples). Affected analytes included aluminum, arsenic, copper, iron, lead, and zinc.

Wet Chemistry No qualifications were required for the wet chemistry analyses (cyanide). The data packages did not include calibration data forms, but the raw data indicated that appropriate procedures were followed, and correlation coefficient requirements were met. The SDGs containing water samples did not include raw calculations of ICV and CCV recoveries, but based on the standards used in the other SDGs, it appeared that recovery limits were acceptable, and no qualifications were required. In order to effectively assess the data, it is important that future data sets include the appropriate QC information.

APPENDIX F

CHEMICAL ANALYTICAL DATA

PLUMBROOK
Wells
Data Summary - Ground Water

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WELLS:VOLATILES-W	Fltr	Units	5010 IT-MW06 18-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5030 IT-MW08 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5050 PB-TNTA-MW10 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,1,1-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2,2-TETRACHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHENE (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROPROPANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
2-BUTANONE		UG/L	20	U	R	20	U	R	20	U	R
2-HEXANONE		UG/L	20	U	U	20	U	U	20	U	U
4-METHYL-2-PENTANONE		UG/L	20	U	U	20	U	U	20	U	U
ACETONE		UG/L	20	U	R	20	U	R	23		J
BENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMODICHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CARBON DISULFIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CARBON TETRACHLORIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
CHLOROFORM		UG/L	5.0	U	U	5.0	U	U	5.0	J B	U
CHLOROMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CIS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
DIBROMOCHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
ETHYLBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
METHYLENE CHLORIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
STYRENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TETRACHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TOLUENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U

WELLS:VOLATILES-W	Fltr	Units	5060 PB-TNTA-MW11 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5070 PB-TNTC-MW3 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5080 PB-TNTC-MW4 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,1,1-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2,2-TETRACHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHENE (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROPROPANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
2-BUTANONE		UG/L	20	U	R	20	U	R	20	U	R
2-HEXANONE		UG/L	20	U	U	20	U	R	20	U	R
4-METHYL-2-PENTANONE		UG/L	20	U	U	20	U	U	20	U	U
ACETONE		UG/L	20	U	R	20	U	R	20	U	R
BENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMODICHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CARBON DISULFIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CARBON TETRACHLORIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
CHLOROFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CIS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
DIBROMOCHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
ETHYLBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
METHYLENE CHLORIDE		UG/L	5.0	U	U	6.9		U	5.9	B	U
STYRENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TETRACHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TOLUENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U

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			5090 PB-TNTC-MW5 30-SEP-96 0 - 0			5100 PB-TNTC-MW6 02-OCT-96 0 - 0			5110 PB-WA-MW1 30-SEP-96 0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,1,1-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2,2-TETRACHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHENE (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROPROPANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
2-BUTANONE		UG/L	20	U	R	20	U	U	20	U	R
2-HEXANONE		UG/L	20	U	R	20	U	R	20	U	R
4-METHYL-2-PENTANONE		UG/L	20	U	U	20	U	U	20	U	U
ACETONE		UG/L	20	U	R	20	U	R	20	U	R
BENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMODICHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CARBON DISULFIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CARBON TETRACHLORIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
CHLOROFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CIS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
DIBROMOCHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
ETHYLBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
METHYLENE CHLORIDE		UG/L	5.7		U	5.0	U	U	5.3		U
STYRENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TETRACHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TOLUENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U

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WELLS:VOLATILES-W	Fltr	Units	5120 PB-WA-MW2 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5130 PB-PR-MW7 21-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5140 PB-PR-MW8 20-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,1,1-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2,2-TETRACHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHENE (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROPROPANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
2-BUTANONE		UG/L	20	U	R	20	U	R	20	U	R
2-HEXANONE		UG/L	20	U	R	20	U	U	20	U	U
4-METHYL-2-PENTANONE		UG/L	20	U	U	20	U	U	20	U	U
ACETONE		UG/L	20	U	R	20	U	R	20	U	R
BENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMODICHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CARBON DISULFIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CARBON TETRACHLORIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
CHLOROFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CIS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
DIBROMOCHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
ETHYLBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
METHYLENE CHLORIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
STYRENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TETRACHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TOLUENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U

WELLS:VOLATILES-W	Fltr	Units	5150 PB-PR-MW9 20-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5160 PB-BED-MW13 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5170 PB-BED-MW14 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,1,1-TRICHLOROETHANE		UG/L	5.0	U	U	10	U	U	5.0	U	U
1,1,2,2-TETRACHLOROETHANE		UG/L	5.0	U	U	10	U	U	5.0	U	U
1,1,2-TRICHLOROETHANE		UG/L	5.0	U	U	10	U	U	5.0	U	U
1,1-DICHLOROETHANE		UG/L	5.0	U	U	10	U	U	5.0	U	U
1,1-DICHLOROETHENE		UG/L	5.0	U	U	10	U	U	5.0	U	U
1,2-DICHLOROETHANE		UG/L	5.0	U	U	10	U	U	5.0	U	U
1,2-DICHLOROETHENE (TOTAL)		UG/L	5.0	U	U	10	U	U	5.0	U	U
1,2-DICHLOROPROPANE		UG/L	5.0	U	U	10	U	U	5.0	U	U
2-BUTANONE		UG/L	20	U	R	40	U	R	20	U	R
2-HEXANONE		UG/L	20	U	U	40	U	U	20	U	U
4-METHYL-2-PENTANONE		UG/L	20	U	U	40	U	U	20	U	U
ACETONE		UG/L	20	U	R	40	U	R	20	U	R
BENZENE		UG/L	5.0	U	U	190			5.0	U	U
BROMODICHLOROMETHANE		UG/L	5.0	U	U	10	U	U	5.0	U	U
BROMOFORM		UG/L	5.0	U	U	10	U	U	5.0	U	U
BROMOMETHANE		UG/L	10	U	U	20	U	U	10	U	U
CARBON DISULFIDE		UG/L	5.0	U	U	3.7	J	J	5.0	U	U
CARBON TETRACHLORIDE		UG/L	5.0	U	U	10	U	U	5.0	U	U
CHLOROBENZENE		UG/L	5.0	U	U	10	U	U	1.1	J	J
CHLOROETHANE		UG/L	10	U	U	20	U	U	10	U	U
CHLOROFORM		UG/L	5.0	U	U	10	U	U	5.0	U	U
CHLOROMETHANE		UG/L	10	U	U	20	U	U	10	U	U
CIS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	10	U	U	5.0	U	U
DIBROMOCHLOROMETHANE		UG/L	5.0	U	U	10	U	U	5.0	U	U
ETHYLBENZENE		UG/L	5.0	U	U	86			5.0	U	U
METHYLENE CHLORIDE		UG/L	5.0	U	U	10	U	U	5.0	U	U
STYRENE		UG/L	5.0	U	U	10	U	U	5.0	U	U
TETRACHLOROETHENE		UG/L	5.0	U	U	10	U	U	5.0	U	U
TOLUENE		UG/L	5.0	U	U	190			1.5	J	J

WELLS:VOLATILES-W	Fltr	Units	5180 PB-BED-MW15 21-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5190 PB-BED-MW16 25-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5200 PB-BED-MW17 24-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,1,1-TRICHLOROETHANE		UG/L	33	U	U	25	U	U	10	U	U
1,1,2,2-TETRACHLOROETHANE		UG/L	33	U	U	25	U	U	10	U	U
1,1,2-TRICHLOROETHANE		UG/L	33	U	U	25	U	U	10	U	U
1,1-DICHLOROETHANE		UG/L	33	U	U	25	U	U	10	U	U
1,1-DICHLOROETHENE		UG/L	33	U	U	25	U	U	10	U	U
1,2-DICHLOROETHANE		UG/L	33	U	U	25	U	U	10	U	U
1,2-DICHLOROETHENE (TOTAL)		UG/L	33	U	U	25	U	U	10	U	U
1,2-DICHLOROPROPANE		UG/L	33	U	U	25	U	U	10	U	U
2-BUTANONE		UG/L	130	U	R	100	U	R	40	U	R
2-HEXANONE		UG/L	130	U	U	100	U	U	40	U	U
4-METHYL-2-PENTANONE		UG/L	130	U	U	100	U	U	40	U	U
ACETONE		UG/L	130	U	R	46	J B	R	40	U	R
BENZENE		UG/L	1300			810			18		
BROMODICHLOROMETHANE		UG/L	33	U	U	25	U	U	10	U	U
BROMOFORM		UG/L	33	U	U	25	U	U	10	U	U
BROMOMETHANE		UG/L	67	U	U	50	U	U	20	U	U
CARBON DISULFIDE		UG/L	33	U	U	19	J	J	6.0	J	J
CARBON TETRACHLORIDE		UG/L	33	U	U	25	U	U	10	U	U
CHLOROBENZENE		UG/L	33	U	U	25	U	U	10	U	U
CHLOROETHANE		UG/L	67	U	U	50	U	U	20	U	U
CHLOROFORM		UG/L	8.6	J B	J	7.8	J B	J	10	U	U
CHLOROMETHANE		UG/L	67	U	U	50	U	U	20	U	U
CIS-1,3-DICHLOROPROPENE		UG/L	33	U	U	25	U	U	10	U	U
DIBROMOCHLOROMETHANE		UG/L	33	U	U	25	U	U	10	U	U
ETHYLBENZENE		UG/L	180			180			87		
METHYLENE CHLORIDE		UG/L	33	U	U	25	U	U	10	U	U
STYRENE		UG/L	33	U	U	25	U	U	10	U	U
TETRACHLOROETHENE		UG/L	33	U	U	25	U	U	10	U	U
TOLUENE		UG/L	800			540			140		

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			5210 PB-BED-MW18 22-OCT-96 0 - 0			5220 PB-BED-MW19 17-OCT-96 0 - 0			5230 PB-BED-MW20 23-OCT-96 0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,1,1-TRICHLOROETHANE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
1,1,2,2-TETRACHLOROETHANE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
1,1,2-TRICHLOROETHANE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHANE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHENE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHANE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHENE (TOTAL)		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROPROPANE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
2-BUTANONE		UG/L	25	U	R	20	U	R	20	U	R
2-HEXANONE		UG/L	25	U	U	20	U	U	20	U	U
4-METHYL-2-PENTANONE		UG/L	25	U	U	20	U	U	20	U	U
ACETONE		UG/L	25	U	R	20	U	R	20	U	R
BENZENE		UG/L	7.9			3.7	J	J	5.0	U	U
BROMODICHLOROMETHANE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
BROMOFORM		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
BROMOMETHANE		UG/L	12	U	U	10	U	U	10	U	U
CARBON DISULFIDE		UG/L	3.1	J	J	5.0	U	U	5.0	U	U
CARBON TETRACHLORIDE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
CHLOROBENZENE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
CHLOROETHANE		UG/L	12	U	U	10	U	U	10	U	U
CHLOROFORM		UG/L	6.2	U	U	5.0	U	U	5.0	J B	U
CHLOROMETHANE		UG/L	12	U	U	10	U	U	10	U	U
CIS-1,3-DICHLOROPROPENE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
DIBROMOCHLOROMETHANE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
ETHYLBENZENE		UG/L	130			2.4	J	J	5.0	U	U
METHYLENE CHLORIDE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
STYRENE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
TETRACHLOROETHENE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
TOLUENE		UG/L	73			2.0	J	J	5.0	U	U

WELLS:VOLATILES-W	Fltr	Units	5240 MK-MW10 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5250 MK-MW11 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5260 MK-MW16 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,1,1-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2,2-TETRACHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHENE (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROPROPANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
2-BUTANONE		UG/L	20	U	R	20	U	R	20	U	R
2-HEXANONE		UG/L	20	U	R	20	U	R	20	U	R
4-METHYL-2-PENTANONE		UG/L	20	U	U	20	U	U	20	U	U
ACETONE		UG/L	5.4	J	J	20	U	R	20	U	R
BENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMODICHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CARBON DISULFIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CARBON TETRACHLORIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROBENZENE		UG/L	1.1	J	J	5.0	U	U	5.0	U	U
CHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
CHLOROFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CIS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
DIBROMOCHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
ETHYLBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
METHYLENE CHLORIDE		UG/L	5.7		U	6.9		U	6.6	B	U
STYRENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TETRACHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TOLUENE		UG/L	1.1	J	J	5.0	U	U	5.0	U	U

WELLS:VOLATILES-W	Fltr	Units	5270 MK-MW17 21-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5280 MK-MW22 22-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5290 MK-MW23 23-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,1,1-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2,2-TETRACHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHENE (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROPROPANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
2-BUTANONE		UG/L	20	U	R	20	U	R	20	U	R
2-HEXANONE		UG/L	20	U	U	20	U	U	20	U	U
4-METHYL-2-PENTANONE		UG/L	20	U	U	20	U	U	20	U	U
ACETONE		UG/L	20	U	R	20	U	R	20	U	R
BENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMODICHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CARBON DISULFIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CARBON TETRACHLORIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
CHLOROFORM		UG/L	5.0	U	U	5.0	U	U	5.0	J B	U
CHLOROMETHANE		UG/L	10	U	U	10	U	U	10	U	U
CIS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
DIBROMOCHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
ETHYLBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
METHYLENE CHLORIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
STYRENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TETRACHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TOLUENE		UG/L	1.8	J	J	5.0	U	U	5.0	U	U

WELLS:VOLATILES-W	Fltr	Units	5300 MK-MW24 22-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5310 IT-MW02 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5320 IT-MW05 20-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,1,1-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2,2-TETRACHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1,2-TRICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,1-DICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROETHENE (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
1,2-DICHLOROPROPANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
2-BUTANONE		UG/L	20	U	R	20.0	U	R	20	U	R
2-HEXANONE		UG/L	20	U	U	20.0	U	R	20	U	U
4-METHYL-2-PENTANONE		UG/L	20	U	U	20.0	U	U	20	U	U
ACETONE		UG/L	20	U	R	20.0	U	R	20	U	R
BENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMODICHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
BROMOMETHANE		UG/L	10	U	U	10.0	U	U	10	U	U
CARBON DISULFIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CARBON TETRACHLORIDE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROBENZENE		UG/L	5.0	U	U	5.0	U	U	1.3	J	J
CHLOROETHANE		UG/L	10	U	U	10.0	U	U	10	U	U
CHLOROFORM		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
CHLOROMETHANE		UG/L	10	U	U	10.0	U	U	10	U	U
CIS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
DIBROMOCHLOROMETHANE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
ETHYLBENZENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
METHYLENE CHLORIDE		UG/L	5.0	U	U	6.1		U	5.0	U	U
STYRENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TETRACHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TOLUENE		UG/L	5.0	U	U	5.0	U	U	1.1	J	J

Sample No:			5010			5030			5050		
Sample Location:			IT-MW06			IT-MW08			PB-TNTA-MW10		
Sample Date:			18-OCT-96			17-OCT-96			27-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TRANS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TRICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
VINYL CHLORIDE		UG/L	10	U	U	10	U	U	10	U	U
XYLENES (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U

Sample No:			5060			5070			5080		
Sample Location:			PB-TNTA-MW11			PB-TNTC-MW3			PB-TNTC-MW4		
Sample Date:			27-SEP-96			27-SEP-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TRANS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TRICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
VINYL CHLORIDE		UG/L	10	U	U	10	U	U	10	U	U
XYLENES (TOTAL)		UG/L	5.0	U	U	1.0	J	J	5.0	U	U

Sample No:			5090			5100			5110		
Sample Location:			PB-TNTC-MW5			PB-TNTC-MW6			PB-WA-MW1		
Sample Date:			30-SEP-96			02-OCT-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TRANS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TRICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
VINYL CHLORIDE		UG/L	10	U	U	10	U	U	10	U	U
XYLENES (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U

Sample No:			5120			5130			5140		
Sample Location:			PB-WA-MW2			PB-PR-MW7			PB-PR-MW8		
Sample Date:			30-SEP-96			21-OCT-96			20-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TRANS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TRICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
VINYL CHLORIDE		UG/L	10	U	U	10	U	U	10	U	U
XYLENES (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U

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Sample No:			5150			5160			5170		
Sample Location:			PB-PR-MW9			PB-BED-MW13			PB-BED-MW14		
Sample Date:			20-OCT-96			17-OCT-96			17-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TRANS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	10	U	U	5.0	U	U
TRICHLOROETHENE		UG/L	5.0	U	U	10	U	U	5.0	U	U
VINYL CHLORIDE		UG/L	10	U	U	20	U	U	10	U	U
XYLENES (TOTAL)		UG/L	5.0	U	U	860			2.7	J	J

Sample No:			5180			5190			5200		
Sample Location:			PB-BED-MW15			PB-BED-MW16			PB-BED-MW17		
Sample Date:			21-OCT-96			25-OCT-96			24-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TRANS-1,3-DICHLOROPROPENE		UG/L	33	U	U	25	U	U	10	U	U
TRICHLOROETHENE		UG/L	33	U	U	25	U	U	10	U	U
VINYL CHLORIDE		UG/L	67	U	U	50	U	U	20	U	U
XYLENES (TOTAL)		UG/L	1100			1300			380		

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Sample No:			5210			5220			5230		
Sample Location:			PB-BED-MW18			PB-BED-MW19			PB-BED-MW20		
Sample Date:			22-OCT-96			17-OCT-96			23-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TRANS-1,3-DICHLOROPROPENE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
TRICHLOROETHENE		UG/L	6.2	U	U	5.0	U	U	5.0	U	U
VINYL CHLORIDE		UG/L	12	U	U	10	U	U	10	U	U
XYLENES (TOTAL)		UG/L	560			19			5.0	U	U

Sample No:			5240			5250			5260		
Sample Location:			MK-MW10			MK-MW11			MK-MW16		
Sample Date:			27-SEP-96			27-SEP-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TRANS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TRICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
VINYL CHLORIDE		UG/L	10	U	U	10	U	U	10	U	U
XYLENES (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U

Sample No:			5270			5280			5290		
Sample Location:			MK-MW17			MK-MW22			MK-MW23		
Sample Date:			21-OCT-96			22-OCT-96			23-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TRANS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TRICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
VINYL CHLORIDE		UG/L	10	U	U	10	U	U	10	U	U
XYLENES (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U

Sample No:			5300			5310			5320		
Sample Location:			MK-MW24			IT-MW02			IT-MW05		
Sample Date:			22-OCT-96			30-SEP-96			20-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:VOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TRANS-1,3-DICHLOROPROPENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
TRICHLOROETHENE		UG/L	5.0	U	U	5.0	U	U	5.0	U	U
VINYL CHLORIDE		UG/L	10	U	U	10.0	U	U	10	U	U
XYLENES (TOTAL)		UG/L	5.0	U	U	5.0	U	U	5.0	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5010 IT-MW06 18-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5030 IT-MW08 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5050 PB-TNTA-MW10 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,2,4-TRICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,2-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,3-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,4-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
2,2'-OXYBIS(1-CHLOROPROPANE)		UG/L	10	U	U	10	U	U	10	U	U
2,4,5-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4,6-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DIMETHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DINITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
2,4-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2,6-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLORONAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2-METHYLNAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
2-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
2-NITROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
3,3'-DICHLOROBENZIDINE		UG/L	50	U	U	50	U	U	50	U	U
3-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4,6-DINITRO-2-METHYLPHENOL		UG/L	50	U	U	50	U	U	50	U	U
4-BROMOPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-CHLORO-3-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROANILINE		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
4-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4-NITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
ACENAPHTHENE		UG/L	10	U	U	10	U	U	10	U	U

			5060 PB-TNTA-MW11 27-SEP-96 0 - 0			5070 PB-TNTC-MW3 27-SEP-96 0 - 0			5080 PB-TNTC-MW4 30-SEP-96 0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,2,4-TRICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,2-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,3-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,4-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
2,2'-OXYBIS(1-CHLOROPROPANE)		UG/L	10	U	U	10	U	U	10	U	U
2,4,5-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4,6-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DIMETHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DINITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
2,4-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2,6-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLORONAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2-METHYLNAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
2-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
2-NITROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
3,3'-DICHLOROBENZIDINE		UG/L	50	U	U	50	U	U	50	U	U
3-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4,6-DINITRO-2-METHYLPHENOL		UG/L	50	U	U	50	U	U	50	U	U
4-BROMOPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-CHLORO-3-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROANILINE		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
4-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4-NITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
ACENAPHTHENE		UG/L	10	U	U	10	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5090 PB-TNTC-MW5 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5100 PB-TNTC-MW6 02-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5110 PB-WA-MW1 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,2,4-TRICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,2-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,3-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,4-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
2,2'-OXYBIS(1-CHLOROPROPANE)		UG/L	10	U	U	10	U	U	10	U	U
2,4,5-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4,6-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DIMETHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DINITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
2,4-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2,6-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLORONAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2-METHYLNAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
2-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
2-NITROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
3,3'-DICHLOROBENZIDINE		UG/L	50	U	U	50	U	U	50	U	U
3-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4,6-DINITRO-2-METHYLPHENOL		UG/L	50	U	U	50	U	U	50	U	U
4-BROMOPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-CHLORO-3-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROANILINE		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
4-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4-NITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
ACENAPHTHENE		UG/L	10	U	U	10	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5120 PB-WA-MW2 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5130 PB-PR-MW7 21-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5140 PB-PR-MW8 20-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,2,4-TRICHLOROBENZENE		UG/L	10	U	U	50	U	U	100	U	U
1,2-DICHLOROBENZENE		UG/L	10	U	U	50	U	U	100	U	U
1,3-DICHLOROBENZENE		UG/L	10	U	U	50	U	U	100	U	U
1,4-DICHLOROBENZENE		UG/L	10	U	U	50	U	U	100	U	U
2,2'-OXYBIS(1-CHLOROPROPANE)		UG/L	10	U	U	50	U	U	100	U	U
2,4,5-TRICHLOROPHENOL		UG/L	10	U	U	50	U	U	100	U	U
2,4,6-TRICHLOROPHENOL		UG/L	10	U	U	50	U	U	100	U	U
2,4-DICHLOROPHENOL		UG/L	10	U	U	50	U	U	100	U	U
2,4-DIMETHYLPHENOL		UG/L	10	U	U	50	U	U	100	U	U
2,4-DINITROPHENOL		UG/L	50	U	U	250	U	U	690	J D	J
2,4-DINITROTOLUENE		UG/L	30			50	U	U	530		
2,6-DINITROTOLUENE		UG/L	2.8	J	J	70			52	J	J
2-CHLORONAPHTHALENE		UG/L	10	U	U	50	U	U	100	U	U
2-CHLOROPHENOL		UG/L	10	U	U	50	U	U	100	U	U
2-METHYLNAPHTHALENE		UG/L	10	U	U	50	U	U	100	U	U
2-METHYLPHENOL		UG/L	10	U	U	50	U	U	100	U	U
2-NITROANILINE		UG/L	50	U	U	250	U	U	500	U	U
2-NITROPHENOL		UG/L	10	U	U	5.2	J	J	100	U	U
3,3'-DICHLOROBENZIDINE		UG/L	50	U	U	250	U	U	500	U	U
3-NITROANILINE		UG/L	110	J	J	250	U	U	500	U	U
4,6-DINITRO-2-METHYLPHENOL		UG/L	50	U	U	250	U	U	870	J D	J
4-BROMOPHENYL PHENYL ETHER		UG/L	10	U	U	50	U	U	100	U	U
4-CHLORO-3-METHYLPHENOL		UG/L	10	U	U	50	U	U	100	U	U
4-CHLOROANILINE		UG/L	10	U	U	50	U	U	100	U	U
4-CHLOROPHENYL PHENYL ETHER		UG/L	10	U	U	50	U	U	100	U	U
4-METHYLPHENOL		UG/L	10	U	U	50	U	U	100	U	U
4-NITROANILINE		UG/L	50	U	U	250	U	U	500	U	U
4-NITROPHENOL		UG/L	50	U	U	250	U	U	500	U	U
ACENAPHTHENE		UG/L	10	U	U	50	U	U	100	U	U

			5150 PB-PR-MW9 20-OCT-96 0 - 0			5160 PB-BED-MW13 17-OCT-96 0 - 0			5170 PB-BED-MW14 17-OCT-96 0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,2,4-TRICHLOROBENZENE		UG/L	10	U	U	30	U	U	10	U	U
1,2-DICHLOROBENZENE		UG/L	10	U	U	30	U	U	10	U	U
1,3-DICHLOROBENZENE		UG/L	10	U	U	30	U	U	10	U	U
1,4-DICHLOROBENZENE		UG/L	10	U	U	30	U	U	10	U	U
2,2'-OXYBIS(1-CHLOROPROPANE)		UG/L	10	U	U	30	U	U	10	U	U
2,4,5-TRICHLOROPHENOL		UG/L	10	U	U	30	U	U	10	U	U
2,4,6-TRICHLOROPHENOL		UG/L	10	U	U	30	U	U	10	U	U
2,4-DICHLOROPHENOL		UG/L	10	U	U	30	U	U	10	U	U
2,4-DIMETHYLPHENOL		UG/L	10	U	U	13	J	J	10	U	U
2,4-DINITROPHENOL		UG/L	50	U	U	150	U	U	50	U	U
2,4-DINITROTOLUENE		UG/L	30			30	U	U	1.7	J	J
2,6-DINITROTOLUENE		UG/L	6.8	J	J	30	U	U	10	U	U
2-CHLORONAPHTHALENE		UG/L	10	U	U	30	U	U	10	U	U
2-CHLOROPHENOL		UG/L	10	U	U	30	U	U	10	U	U
2-METHYLNAPHTHALENE		UG/L	10	U	U	34			10	U	U
2-METHYLPHENOL		UG/L	10	U	U	30	U	U	10	U	U
2-NITROANILINE		UG/L	2.0	J	J	150	U	U	50	U	U
2-NITROPHENOL		UG/L	10	U	U	30	U	U	10	U	U
3,3'-DICHLOROBENZIDINE		UG/L	50	U	U	150	U	U	50	U	U
3-NITROANILINE		UG/L	50	U	U	150	U	U	50	U	U
4,6-DINITRO-2-METHYLPHENOL		UG/L	50	U	U	150	U	U	50	U	U
4-BROMOPHENYL PHENYL ETHER		UG/L	10	U	U	30	U	U	10	U	U
4-CHLORO-3-METHYLPHENOL		UG/L	10	U	U	30	U	U	10	U	U
4-CHLOROANILINE		UG/L	10	U	U	30	U	U	10	U	U
4-CHLOROPHENYL PHENYL ETHER		UG/L	10	U	U	30	U	U	10	U	U
4-METHYLPHENOL		UG/L	10	U	U	30	U	U	10	U	U
4-NITROANILINE		UG/L	50	U	U	150	U	U	50	U	U
4-NITROPHENOL		UG/L	50	U	U	150	U	U	50	U	U
ACENAPHTHENE		UG/L	10	U	U	30	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5180 PB-BED-MW15 21-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5190 PB-BED-MW16 25-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5200 PB-BED-MW17 24-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,2,4-TRICHLOROBENZENE		UG/L	100	U	U	200	U	U	20	U	U
1,2-DICHLOROBENZENE		UG/L	100	U	U	200	U	U	20	U	U
1,3-DICHLOROBENZENE		UG/L	100	U	U	200	U	U	20	U	U
1,4-DICHLOROBENZENE		UG/L	100	U	U	200	U	U	20	U	U
2,2'-OXYBIS(1-CHLOROPROPANE)		UG/L	100	U	U	200	U	U	20	U	U
2,4,5-TRICHLOROPHENOL		UG/L	100	U	U	200	U	U	20	U	U
2,4,6-TRICHLOROPHENOL		UG/L	100	U	U	200	U	U	20	U	U
2,4-DICHLOROPHENOL		UG/L	100	U	U	200	U	U	20	U	U
2,4-DIMETHYLPHENOL		UG/L	16	J	J	200	U	U	20	U	U
2,4-DINITROPHENOL		UG/L	500	U	U	1000	U	U	100	U	U
2,4-DINITROTOLUENE		UG/L	100	U	U	200	U	U	20	U	U
2,6-DINITROTOLUENE		UG/L	100	U	U	200	U	U	20	U	U
2-CHLORONAPHTHALENE		UG/L	100	U	U	200	U	U	20	U	U
2-CHLOROPHENOL		UG/L	100	U	U	200	U	U	20	U	U
2-METHYLNAPHTHALENE		UG/L	72	J	J	69	J	J	17	J	J
2-METHYLPHENOL		UG/L	100	U	U	200	U	U	20	U	U
2-NITROANILINE		UG/L	500	U	U	1000	U	U	100	U	U
2-NITROPHENOL		UG/L	100	U	U	200	U	U	20	U	U
3,3'-DICHLOROBENZIDINE		UG/L	500	U	U	1000	U	U	100	U	U
3-NITROANILINE		UG/L	500	U	U	1000	U	U	100	U	U
4,6-DINITRO-2-METHYLPHENOL		UG/L	500	U	U	1000	U	U	100	U	U
4-BROMOPHENYL PHENYL ETHER		UG/L	100	U	U	200	U	U	20	U	U
4-CHLORO-3-METHYLPHENOL		UG/L	100	U	U	200	U	U	20	U	U
4-CHLOROANILINE		UG/L	100	U	U	200	U	U	20	U	U
4-CHLOROPHENYL PHENYL ETHER		UG/L	100	U	U	200	U	U	20	U	U
4-METHYLPHENOL		UG/L	100	U	U	200	U	U	20	U	U
4-NITROANILINE		UG/L	500	U	U	1000	U	U	100	U	U
4-NITROPHENOL		UG/L	500	U	U	1000	U	U	100	U	U
ACENAPHTHENE		UG/L	100	U	U	200	U	U	20	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5210 PB-BED-MW18 22-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5220 PB-BED-MW19 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5230 PB-BED-MW20 23-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,2,4-TRICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,2-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,3-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,4-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
2,2'-OXYBIS(1-CHLOROPROPANE)		UG/L	10	U	U	10	U	U	10	U	U
2,4,5-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4,6-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DIMETHYLPHENOL		UG/L	16			10	U	U	10	U	U
2,4-DINITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
2,4-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2,6-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLORONAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2-METHYLNAPHTHALENE		UG/L	11			3.5	J	J	10	U	U
2-METHYLPHENOL		UG/L	5.7	J	J	10	U	U	10	U	U
2-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
2-NITROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
3,3'-DICHLOROBENZIDINE		UG/L	50	U	U	50	U	U	50	U	U
3-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4,6-DINITRO-2-METHYLPHENOL		UG/L	50	U	U	50	U	U	50	U	U
4-BROMOPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-CHLORO-3-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROANILINE		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-METHYLPHENOL		UG/L	7.3	J	J	10	U	U	10	U	U
4-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4-NITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
ACENAPHTHENE		UG/L	10	U	U	10	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5240 MK-MW10 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5250 MK-MW11 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5260 MK-MW16 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,2,4-TRICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,2-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,3-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,4-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
2,2'-OXYBIS(1-CHLOROPROPANE)		UG/L	10	U	U	10	U	U	10	U	U
2,4,5-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4,6-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DIMETHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DINITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
2,4-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2,6-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLORONAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2-METHYLNAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
2-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
2-NITROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
3,3'-DICHLOROBENZIDINE		UG/L	50	U	U	50	U	U	50	U	U
3-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4,6-DINITRO-2-METHYLPHENOL		UG/L	50	U	U	50	U	U	50	U	U
4-BROMOPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-CHLORO-3-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROANILINE		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
4-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4-NITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
ACENAPHTHENE		UG/L	10	U	U	10	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5270 MK-MW17 21-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5280 MK-MW22 22-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5290 MK-MW23 23-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,2,4-TRICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,2-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,3-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
1,4-DICHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
2,2'-OXYBIS(1-CHLOROPROPANE)		UG/L	10	U	U	10	U	U	10	U	U
2,4,5-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4,6-TRICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DICHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DIMETHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2,4-DINITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
2,4-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2,6-DINITROTOLUENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLORONAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
2-CHLOROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2-METHYLNAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
2-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
2-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
2-NITROPHENOL		UG/L	10	U	U	10	U	U	10	U	U
3,3'-DICHLOROBENZIDINE		UG/L	50	U	U	50	U	U	50	U	U
3-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4,6-DINITRO-2-METHYLPHENOL		UG/L	50	U	U	50	U	U	50	U	U
4-BROMOPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-CHLORO-3-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROANILINE		UG/L	10	U	U	10	U	U	10	U	U
4-CHLOROPHENYL PHENYL ETHER		UG/L	10	U	U	10	U	U	10	U	U
4-METHYLPHENOL		UG/L	10	U	U	10	U	U	10	U	U
4-NITROANILINE		UG/L	50	U	U	50	U	U	50	U	U
4-NITROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
ACENAPHTHENE		UG/L	10	U	U	10	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5300 MK-MW24 22-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5310 IT-MW02 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5320 IT-MW05 20-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
1,2,4-TRICHLOROBENZENE		UG/L	10	U	U	20	U	U	10	U	U
1,2-DICHLOROBENZENE		UG/L	10	U	U	20	U	U	10	U	U
1,3-DICHLOROBENZENE		UG/L	10	U	U	20	U	U	10	U	U
1,4-DICHLOROBENZENE		UG/L	10	U	U	20	U	U	10	U	U
2,2'-OXYBIS(1-CHLOROPROPANE)		UG/L	10	U	U	20	U	U	10	U	U
2,4,5-TRICHLOROPHENOL		UG/L	10	U	U	20	U	U	10	U	U
2,4,6-TRICHLOROPHENOL		UG/L	10	U	U	20	U	U	10	U	U
2,4-DICHLOROPHENOL		UG/L	10	U	U	20	U	U	10	U	U
2,4-DIMETHYLPHENOL		UG/L	10	U	U	20	U	U	10	U	U
2,4-DINITROPHENOL		UG/L	50	U	U	100	U	U	50	U	U
2,4-DINITROTOLUENE		UG/L	10	U	U	110	ISB	J	10	U	U
2,6-DINITROTOLUENE		UG/L	10	U	U	16	J ISB	J	10	U	U
2-CHLORONAPHTHALENE		UG/L	10	U	U	20	U	U	10	U	U
2-CHLOROPHENOL		UG/L	10	U	U	20	U	U	10	U	U
2-METHYLNAPHTHALENE		UG/L	10	U	U	20	U	U	10	U	U
2-METHYLPHENOL		UG/L	10	U	U	20	U	U	10	U	U
2-NITROANILINE		UG/L	50	U	U	100	U	U	50	U	U
2-NITROPHENOL		UG/L	10	U	U	20	U	U	10	U	U
3,3'-DICHLOROBENZIDINE		UG/L	50	U	U	100	U	U	50	U	U
3-NITROANILINE		UG/L	50	U	U	4.1	J ISB	J	50	U	U
4,6-DINITRO-2-METHYLPHENOL		UG/L	50	U	U	60	J ISB	J	50	U	U
4-BROMOPHENYL PHENYL ETHER		UG/L	10	U	U	20	U	U	10	U	U
4-CHLORO-3-METHYLPHENOL		UG/L	10	U	U	20	U	U	10	U	U
4-CHLOROANILINE		UG/L	10	U	U	20	U	U	10	U	U
4-CHLOROPHENYL PHENYL ETHER		UG/L	10	U	U	20	U	U	10	U	U
4-METHYLPHENOL		UG/L	10	U	U	20	U	U	10	U	U
4-NITROANILINE		UG/L	50	U	U	100	U	U	50	U	U
4-NITROPHENOL		UG/L	50	U	U	100	U	U	50	U	U
ACENAPHTHENE		UG/L	10	U	U	20	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5010 IT-MW06 18-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5030 IT-MW08 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5050 PB-TNTA-MW10 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ACENAPHTHYLENE		UG/L	10	U	U	10	U	U	10	U	U
ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(B)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(GHI)PERYLENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(K)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHOXY)METHANE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHYL) ETHER		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
BUTYL BENZYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
CARBAZOLE		UG/L	10	U	U	10	U	U	10	U	U
CHRYSENE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-BUTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-OCTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZ(A,H)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZOFURAN		UG/L	10	U	U	10	U	U	10	U	U
DIETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIMETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
FLUORENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBUTADIENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROCYCLOPENTADIENE		UG/L	50	U	U	50	U	U	50	U	U
HEXACHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
INDENO(1,2,3-CD)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
ISOPHORONE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODI-N-PROPYLAMINE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODIPHENYLAMINE		UG/L	10	U	U	10	U	U	10	U	U

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WELLS:SEMIVOLATILES-W	Fltr	Units	5060 PB-TNTA-MW11 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5070 PB-TNTC-MW3 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5080 PB-TNTC-MW4 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ACENAPHTHYLENE		UG/L	10	U	U	10	U	U	10	U	U
ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(B)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(GHI)PERYLENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(K)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHOXY)METHANE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHYL) ETHER		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	10	U	U	1.2	J	J	10	U	U
BUTYL BENZYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
CARBAZOLE		UG/L	10	U	U	10	U	U	10	U	U
CHRYSENE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-BUTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-OCTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZ(A,H)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZOFURAN		UG/L	10	U	U	10	U	U	10	U	U
DIETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIMETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
FLUORENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBUTADIENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROCYCLOPENTADIENE		UG/L	50	U	U	50	U	U	50	U	U
HEXACHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
INDENO(1,2,3-CD)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
ISOPHORONE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODI-N-PROPYLAMINE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODIPHENYLAMINE		UG/L	10	U	U	10	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5090 PB-TNTC-MW5 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5100 PB-TNTC-MW6 02-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5110 PB-WA-MW1 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ACENAPHTHYLENE		UG/L	10	U	U	10	U	U	10	U	U
ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(B)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(GHI)PERYLENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(K)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHOXY)METHANE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHYL) ETHER		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
BUTYL BENZYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
CARBAZOLE		UG/L	10	U	U	10	U	U	10	U	U
CHRYSENE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-BUTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-OCTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZ(A,H)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZOFURAN		UG/L	10	U	U	10	U	U	10	U	U
DIETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIMETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
FLUORENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBUTADIENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROCYCLOPENTADIENE		UG/L	50	U	U	50	U	U	50	U	U
HEXACHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
INDENO(1,2,3-CD)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
ISOPHORONE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODI-N-PROPYLAMINE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODIPHENYLAMINE		UG/L	10	U	U	10	U	U	10	U	U

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WELLS:SEMIVOLATILES-W	Fltr	Units	5120 PB-WA-MW2 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5130 PB-PR-MW7 21-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5140 PB-PR-MW8 20-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ACENAPHTHYLENE		UG/L	10	U	U	50	U	U	100	U	U
ANTHRACENE		UG/L	10	U	U	50	U	U	100	U	U
BENZO(A)ANTHRACENE		UG/L	10	U	U	50	U	U	100	U	U
BENZO(A)PYRENE		UG/L	10	U	UJ	50	U	R	100	U	U
BENZO(B)FLUORANTHENE		UG/L	10	U	UJ	50	U	R	100	U	U
BENZO(GHI)PERYLENE		UG/L	10	U	UJ	50	U	R	100	U	U
BENZO(K)FLUORANTHENE		UG/L	10	U	UJ	50	U	R	100	U	U
BIS(2-CHLOROETHOXY)METHANE		UG/L	10	U	U	50	U	U	100	U	U
BIS(2-CHLOROETHYL) ETHER		UG/L	10	U	U	50	U	U	100	U	U
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	10	U	U	50	U	U	100	U	U
BUTYL BENZYL PHTHALATE		UG/L	10	U	U	50	U	U	100	U	U
CARBAZOLE		UG/L	10	U	U	50	U	U	100	U	U
CHRYSENE		UG/L	10	U	U	50	U	U	100	U	U
DI-N-BUTYL PHTHALATE		UG/L	10	U	U	50	U	U	100	U	U
DI-N-OCTYL PHTHALATE		UG/L	10	U	UJ	50	U	R	100	U	U
DIBENZ(A,H)ANTHRACENE		UG/L	10	U	UJ	50	U	R	100	U	U
DIBENZOFURAN		UG/L	10	U	U	50	U	U	100	U	U
DIETHYL PHTHALATE		UG/L	10	U	U	50	U	U	100	U	U
DIMETHYL PHTHALATE		UG/L	10	U	U	50	U	U	100	U	U
FLUORANTHENE		UG/L	10	U	U	50	U	U	100	U	U
FLUORENE		UG/L	10	U	U	50	U	U	100	U	U
HEXACHLOROBENZENE		UG/L	10	U	U	50	U	U	100	U	U
HEXACHLOROBUTADIENE		UG/L	10	U	U	50	U	U	100	U	U
HEXACHLOROCYCLOPENTADIENE		UG/L	50	U	U	250	U	U	500	U	U
HEXACHLOROETHANE		UG/L	10	U	U	50	U	U	100	U	U
INDENO(1,2,3-CD)PYRENE		UG/L	10	U	UJ	50	U	R	100	U	U
ISOPHORONE		UG/L	10	U	U	50	U	U	100	U	U
N-NITROSODI-N-PROPYLAMINE		UG/L	10	U	U	50	U	U	100	U	U
N-NITROSODIPHENYLAMINE		UG/L	10	U	U	50	U	U	100	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5150 PB-PR-MW9 20-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5160 PB-BED-MW13 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5170 PB-BED-MW14 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ACENAPHTHYLENE		UG/L	10	U	U	30	U	U	10	U	U
ANTHRACENE		UG/L	10	U	U	30	U	U	10	U	U
BENZO(A)ANTHRACENE		UG/L	10	U	U	30	U	U	10	U	U
BENZO(A)PYRENE		UG/L	10	U	R	30	U	U	10	U	UJ
BENZO(B)FLUORANTHENE		UG/L	10	U	R	30	U	U	10	U	UJ
BENZO(GHI)PERYLENE		UG/L	10	U	R	30	U	U	10	U	UJ
BENZO(K)FLUORANTHENE		UG/L	10	U	R	30	U	U	10	U	UJ
BIS(2-CHLOROETHOXY)METHANE		UG/L	10	U	U	30	U	U	10	U	U
BIS(2-CHLOROETHYL) ETHER		UG/L	10	U	U	30	U	U	10	U	U
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	10	U	U	4.7	J	J	1.0	J	J
BUTYL BENZYL PHTHALATE		UG/L	10	U	U	30	U	U	10	U	U
CARBAZOLE		UG/L	10	U	U	30	U	U	10	U	U
CHRYSENE		UG/L	10	U	U	30	U	U	10	U	U
DI-N-BUTYL PHTHALATE		UG/L	10	U	U	30	U	U	10	U	U
DI-N-OCTYL PHTHALATE		UG/L	10	U	R	30	U	U	10	U	UJ
DIBENZ(A,H)ANTHRACENE		UG/L	10	U	R	30	U	U	10	U	UJ
DIBENZOFURAN		UG/L	10	U	U	30	U	U	10	U	U
DIETHYL PHTHALATE		UG/L	10	U	U	30	U	U	10	U	U
DIMETHYL PHTHALATE		UG/L	10	U	U	30	U	U	10	U	U
FLUORANTHENE		UG/L	10	U	U	30	U	U	10	U	U
FLUORENE		UG/L	10	U	U	30	U	U	10	U	U
HEXACHLOROBENZENE		UG/L	10	U	U	30	U	U	10	U	U
HEXACHLOROBUTADIENE		UG/L	10	U	U	30	U	U	10	U	U
HEXACHLOROCYCLOPENTADIENE		UG/L	50	U	U	150	U	U	50	U	U
HEXACHLOROETHANE		UG/L	10	U	U	30	U	U	10	U	U
INDENO(1,2,3-CD)PYRENE		UG/L	10	U	R	30	U	U	10	U	UJ
ISOPHORONE		UG/L	10	U	U	30	U	U	10	U	U
N-NITROSODI-N-PROPYLAMINE		UG/L	10	U	U	30	U	U	10	U	U
N-NITROSODIPHENYLAMINE		UG/L	10	U	U	30	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5180 PB-BED-MW15 21-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5190 PB-BED-MW16 25-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5200 PB-BED-MW17 24-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ACENAPHTHYLENE		UG/L	100	U	U	200	U	U	20	U	U
ANTHRACENE		UG/L	100	U	U	200	U	U	20	U	U
BENZO(A)ANTHRACENE		UG/L	100	U	U	200	U	U	20	U	U
BENZO(A)PYRENE		UG/L	100	U	U	200	U	U	20	U	U
BENZO(B)FLUORANTHENE		UG/L	100	U	U	200	U	U	20	U	U
BENZO(GHI)PERYLENE		UG/L	100	U	U	200	U	U	20	U	U
BENZO(K)FLUORANTHENE		UG/L	100	U	U	200	U	U	20	U	U
BIS(2-CHLOROETHOXY)METHANE		UG/L	100	U	U	200	U	U	20	U	U
BIS(2-CHLOROETHYL) ETHER		UG/L	100	U	U	200	U	U	20	U	U
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	14	J	J	200	U	U	20	U	U
BUTYL BENZYL PHTHALATE		UG/L	100	U	U	200	U	U	20	U	U
CARBAZOLE		UG/L	100	U	U	200	U	U	20	U	U
CHRYSENE		UG/L	100	U	U	200	U	U	20	U	U
DI-N-BUTYL PHTHALATE		UG/L	100	U	U	200	U	U	20	U	U
DI-N-OCTYL PHTHALATE		UG/L	100	U	U	200	U	U	20	U	U
DIBENZ(A,H)ANTHRACENE		UG/L	100	U	U	200	U	U	20	U	U
DIBENZOFURAN		UG/L	100	U	U	200	U	U	20	U	U
DIETHYL PHTHALATE		UG/L	100	U	U	200	U	U	20	U	U
DIMETHYL PHTHALATE		UG/L	100	U	U	200	U	U	20	U	U
FLUORANTHENE		UG/L	100	U	U	200	U	U	20	U	U
FLUORENE		UG/L	100	U	U	200	U	U	20	U	U
HEXACHLOROBENZENE		UG/L	100	U	U	200	U	U	20	U	U
HEXACHLOROBUTADIENE		UG/L	100	U	U	200	U	U	20	U	U
HEXACHLOROCYCLOPENTADIENE		UG/L	500	U	U	1000	U	U	100	U	U
HEXACHLOROETHANE		UG/L	100	U	U	200	U	U	20	U	U
INDENO(1,2,3-CD)PYRENE		UG/L	100	U	U	200	U	U	20	U	U
ISOPHORONE		UG/L	100	U	U	200	U	U	20	U	U
N-NITROSODI-N-PROPYLAMINE		UG/L	100	U	U	200	U	U	20	U	U
N-NITROSODIPHENYLAMINE		UG/L	100	U	U	200	U	U	20	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5210 PB-BED-MW18 22-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5220 PB-BED-MW19 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5230 PB-BED-MW20 23-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ACENAPHTHYLENE		UG/L	10	U	U	10	U	U	10	U	U
ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(B)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(GHI)PERYLENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(K)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHOXY)METHANE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHYL) ETHER		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
BUTYL BENZYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
CARBAZOLE		UG/L	10	U	U	10	U	U	10	U	U
CHRYSENE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-BUTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-OCTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZ(A,H)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZOFURAN		UG/L	10	U	U	10	U	U	10	U	U
DIETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIMETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
FLUORENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBUTADIENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROCYCLOPENTADIENE		UG/L	50	U	U	50	U	U	50	U	U
HEXACHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
INDENO(1,2,3-CD)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
ISOPHORONE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODI-N-PROPYLAMINE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODIPHENYLAMINE		UG/L	10	U	U	10	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5240 MK-MW10 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5250 MK-MW11 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5260 MK-MW16 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ACENAPHTHYLENE		UG/L	10	U	U	10	U	U	10	U	U
ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(B)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(GHI)PERYLENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(K)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHOXY)METHANE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHYL) ETHER		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
BUTYL BENZYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
CARBAZOLE		UG/L	10	U	U	10	U	U	10	U	U
CHRYSENE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-BUTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-OCTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZ(A,H)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZOFURAN		UG/L	10	U	U	10	U	U	10	U	U
DIETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIMETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
FLUORENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBUTADIENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROCYCLOPENTADIENE		UG/L	50	U	U	50	U	U	50	U	U
HEXACHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
INDENO(1,2,3-CD)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
ISOPHORONE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODI-N-PROPYLAMINE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODIPHENYLAMINE		UG/L	10	U	U	10	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5270 MK-MW17 21-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5280 MK-MW22 22-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5290 MK-MW23 23-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ACENAPHTHYLENE		UG/L	10	U	U	10	U	U	10	U	U
ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(A)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(B)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(GHI)PERYLENE		UG/L	10	U	U	10	U	U	10	U	U
BENZO(K)FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHOXY)METHANE		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-CHLOROETHYL) ETHER		UG/L	10	U	U	10	U	U	10	U	U
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
BUTYL BENZYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
CARBAZOLE		UG/L	10	U	U	10	U	U	10	U	U
CHRYSENE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-BUTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DI-N-OCTYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZ(A,H)ANTHRACENE		UG/L	10	U	U	10	U	U	10	U	U
DIBENZOFURAN		UG/L	10	U	U	10	U	U	10	U	U
DIETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
DIMETHYL PHTHALATE		UG/L	10	U	U	10	U	U	10	U	U
FLUORANTHENE		UG/L	10	U	U	10	U	U	10	U	U
FLUORENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROBUTADIENE		UG/L	10	U	U	10	U	U	10	U	U
HEXACHLOROCYCLOPENTADIENE		UG/L	50	U	U	50	U	U	50	U	U
HEXACHLOROETHANE		UG/L	10	U	U	10	U	U	10	U	U
INDENO(1,2,3-CD)PYRENE		UG/L	10	U	U	10	U	U	10	U	U
ISOPHORONE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODI-N-PROPYLAMINE		UG/L	10	U	U	10	U	U	10	U	U
N-NITROSODIPHENYLAMINE		UG/L	10	U	U	10	U	U	10	U	U

WELLS:SEMIVOLATILES-W	Fltr	Units	5300 MK-MW24 22-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5310 IT-MW02 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5320 IT-MW05 20-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ACENAPHTHYLENE		UG/L	10	U	U	20	U	U	10	U	U
ANTHRACENE		UG/L	10	U	U	20	U	U	10	U	U
BENZO(A)ANTHRACENE		UG/L	10	U	U	20	U	U	10	U	U
BENZO(A)PYRENE		UG/L	10	U	U	20	U	UJ	10	U	U
BENZO(B)FLUORANTHENE		UG/L	10	U	U	20	U	UJ	10	U	U
BENZO(GHI)PERYLENE		UG/L	10	U	U	20	U	UJ	10	U	U
BENZO(K)FLUORANTHENE		UG/L	10	U	U	20	U	UJ	10	U	U
BIS(2-CHLOROETHOXY)METHANE		UG/L	10	U	U	20	U	U	10	U	U
BIS(2-CHLOROETHYL) ETHER		UG/L	10	U	U	20	U	U	10	U	U
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	10	U	U	20	U	U	10	U	U
BUTYL BENZYL PHTHALATE		UG/L	10	U	U	20	U	U	10	U	U
CARBAZOLE		UG/L	10	U	U	20	U	U	10	U	U
CHRYSENE		UG/L	10	U	U	20	U	U	10	U	U
DI-N-BUTYL PHTHALATE		UG/L	10	U	U	20	U	U	10	U	U
DI-N-OCTYL PHTHALATE		UG/L	10	U	U	20	U	UJ	10	U	U
DIBENZ(A,H)ANTHRACENE		UG/L	10	U	U	20	U	UJ	10	U	U
DIBENZOFURAN		UG/L	10	U	U	20	U	U	10	U	U
DIETHYL PHTHALATE		UG/L	10	U	U	20	U	U	10	U	U
DIMETHYL PHTHALATE		UG/L	10	U	U	20	U	U	10	U	U
FLUORANTHENE		UG/L	10	U	U	20	U	U	10	U	U
FLUORENE		UG/L	10	U	U	20	U	U	10	U	U
HEXACHLOROBENZENE		UG/L	10	U	U	20	U	U	10	U	U
HEXACHLOROBUTADIENE		UG/L	10	U	U	20	U	U	10	U	U
HEXACHLOROCYCLOPENTADIENE		UG/L	50	U	U	100	U	U	50	U	U
HEXACHLOROETHANE		UG/L	10	U	U	20	U	U	10	U	U
INDENO(1,2,3-CD)PYRENE		UG/L	10	U	U	20	U	UJ	10	U	U
ISOPHORONE		UG/L	10	U	U	20	U	U	10	U	U
N-NITROSODI-N-PROPYLAMINE		UG/L	10	U	U	20	U	U	10	U	U
N-NITROSODIPHENYLAMINE		UG/L	10	U	U	20	U	U	10	U	U

Sample No:			5010			5030			5050		
Sample Location:			IT-MW06			IT-MW08			PB-TNTA-MW10		
Sample Date:			18-OCT-96			17-OCT-96			27-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
NAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
NITROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
PENTACHLOROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
PHENANTHRENE		UG/L	10	U	U	10	U	U	10	U	U
PHENOL		UG/L	10	U	U	10	U	U	10	U	U
PYRENE		UG/L	10	U	U	10	U	U	10	U	U

Sample No:			5060			5070			5080		
Sample Location:			PB-TNTA-MW11			PB-TNTC-MW3			PB-TNTC-MW4		
Sample Date:			27-SEP-96			27-SEP-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
NAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
NITROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
PENTACHLOROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
PHENANTHRENE		UG/L	10	U	U	10	U	U	10	U	U
PHENOL		UG/L	10	U	U	10	U	U	10	U	U
PYRENE		UG/L	10	U	U	10	U	U	10	U	U

Sample No:			5090			5100			5110		
Sample Location:			PB-TNTC-MW5			PB-TNTC-MW6			PB-WA-MW1		
Sample Date:			30-SEP-96			02-OCT-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
NAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
NITROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
PENTACHLOROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
PHENANTHRENE		UG/L	10	U	U	10	U	U	10	U	U
PHENOL		UG/L	10	U	U	10	U	U	10	U	U
PYRENE		UG/L	10	U	U	10	U	U	10	U	U

PLUMBROOK
Wells
Data Summary - Ground Water

Report Date: 04/07/97

Sample No:			5120			5130			5140		
Sample Location:			PB-WA-MW2			PB-PR-MW7			PB-PR-MW8		
Sample Date:			30-SEP-96			21-OCT-96			20-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
NAPHTHALENE		UG/L	10	U	U	50	U	U	100	U	U
NITROBENZENE		UG/L	10	U	U	6.9	J	J	100	U	U
PENTACHLOROPHENOL		UG/L	50	U	U	250	U	U	500	U	U
PHENANTHRENE		UG/L	10	U	U	50	U	U	100	U	U
PHENOL		UG/L	10	U	U	50	U	U	100	U	U
PYRENE		UG/L	10	U	U	50	U	U	100	U	U

Sample No:			5150			5160			5170		
Sample Location:			PB-PR-MW9			PB-BED-MW13			PB-BED-MW14		
Sample Date:			20-OCT-96			17-OCT-96			17-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
NAPHTHALENE		UG/L	10	U	U	36			10	U	U
NITROBENZENE		UG/L	10	U	U	30	U	U	10	U	U
PENTACHLOROPHENOL		UG/L	50	U	U	150	U	U	50	U	U
PHENANTHRENE		UG/L	10	U	U	30	U	U	10	U	U
PHENOL		UG/L	10	U	U	30	U	U	10	U	U
PYRENE		UG/L	10	U	U	30	U	U	10	U	U

Sample No:			5180			5190			5200		
Sample Location:			PB-BED-MW15			PB-BED-MW16			PB-BED-MW17		
Sample Date:			21-OCT-96			25-OCT-96			24-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
NAPHTHALENE		UG/L	52	J	J	51	J	J	17	J	J
NITROBENZENE		UG/L	100	U	U	200	U	U	20	U	U
PENTACHLOROPHENOL		UG/L	500	U	U	1000	U	U	100	U	U
PHENANTHRENE		UG/L	100	U	U	200	U	U	20	U	U
PHENOL		UG/L	40	J	J	200	U	U	20	U	U
PYRENE		UG/L	100	U	U	200	U	U	20	U	U

Sample No:			5210			5220			5230		
Sample Location:			PB-BED-MW18			PB-BED-MW19			PB-BED-MW20		
Sample Date:			22-OCT-96			17-OCT-96			23-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
NAPHTHALENE		UG/L	18			2.2	J	J	10	U	U
NITROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
PENTACHLOROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
PHENANTHRENE		UG/L	10	U	U	10	U	U	10	U	U
PHENOL		UG/L	10	U	U	10	U	U	10	U	U
PYRENE		UG/L	10	U	U	10	U	U	10	U	U

Sample No:			5240			5250			5260		
Sample Location:			MK-MW10			MK-MW11			MK-MW16		
Sample Date:			27-SEP-96			27-SEP-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
NAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
NITROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
PENTACHLOROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
PHENANTHRENE		UG/L	10	U	U	10	U	U	10	U	U
PHENOL		UG/L	10	U	U	10	U	U	10	U	U
PYRENE		UG/L	10	U	U	10	U	U	10	U	U

Sample No:			5270			5280			5290		
Sample Location:			MK-MW17			MK-MW22			MK-MW23		
Sample Date:			21-OCT-96			22-OCT-96			23-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
NAPHTHALENE		UG/L	10	U	U	10	U	U	10	U	U
NITROBENZENE		UG/L	10	U	U	10	U	U	10	U	U
PENTACHLOROPHENOL		UG/L	50	U	U	50	U	U	50	U	U
PHENANTHRENE		UG/L	10	U	U	10	U	U	10	U	U
PHENOL		UG/L	10	U	U	10	U	U	10	U	U
PYRENE		UG/L	10	U	U	10	U	U	10	U	U

Sample No:			5300			5310			5320		
Sample Location:			MK-MW24			IT-MW02			IT-MW05		
Sample Date:			22-OCT-96			30-SEP-96			20-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:SEMIVOLATILES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
NAPHTHALENE		UG/L	10	U	U	20	U	U	10	U	U
NITROBENZENE		UG/L	10	U	U	20	U	U	10	U	U
PENTACHLOROPHENOL		UG/L	50	U	U	100	U	U	50	U	U
PHENANTHRENE		UG/L	10	U	U	20	U	U	10	U	U
PHENOL		UG/L	10	U	U	20	U	U	10	U	U
PYRENE		UG/L	10	U	U	20	U	U	10	U	U

Sample No:			5010			5030			5050		
Sample Location:			IT-MW06			IT-MW08			PB-TNTA-MW10		
Sample Date:			18-OCT-96			17-OCT-96			27-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:PEST/PCB-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
4,4'-DDD		UG/L	0.050	U	UJ	0.050	U	U	0.050	U	U
4,4'-DDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
4,4'-DDT		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALPHA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALPHA-CHLORDANE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
AROCLOR 1016		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1221		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1232		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1242		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1248		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1254		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1260		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
BETA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
DELTA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
DIELDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN I		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN II		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN SULFATE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN ALDEHYDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN KETONE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
GAMMA-BHC (LINDANE)		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
GAMMA-CHLORDANE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
HEPTACHLOR		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
HEPTACHLOR EPOXIDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
METHOXYCHLOR		UG/L	0.10	U	UJ	0.10	U	UJ	0.10	U	UJ
TOXAPHENE		UG/L	2.0	U	U	2.0	U	U	2.0	U	U

Sample No:			5060			5070			5080		
Sample Location:			PB-TNTA-MW11			PB-TNTC-MW3			PB-TNTC-MW4		
Sample Date:			27-SEP-96			27-SEP-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:PEST/PCB-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
4,4'-DDD		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
4,4'-DDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
4,4'-DDT		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALPHA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALPHA-CHLORDANE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
AROCLOR 1016		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1221		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1232		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1242		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1248		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1254		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1260		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
BETA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
DELTA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
DIELDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN I		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN II		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN SULFATE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN ALDEHYDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN KETONE		UG/L	0.050	U	U	0.050	U	U	0.050	U	UJ
GAMMA-BHC (LINDANE)		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
GAMMA-CHLORDANE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
HEPTACHLOR		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
HEPTACHLOR EPOXIDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
METHOXYCHLOR		UG/L	0.10	U	UJ	0.10	U	U	0.10	U	U
TOXAPHENE		UG/L	2.0	U	U	2.0	U	U	2.0	U	U

Sample No:			5090			5100			5110		
Sample Location:			PB-TNTC-MW5			PB-TNTC-MW6			PB-WA-MW1		
Sample Date:			30-SEP-96			02-OCT-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:PEST/PCB-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
4,4'-DDD		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
4,4'-DDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
4,4'-DDT		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALPHA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALPHA-CHLORDANE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
AROCLOR 1016		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1221		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1232		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1242		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1248		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1254		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1260		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
BETA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
DELTA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
DIELDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN I		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN II		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN SULFATE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN ALDEHYDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN KETONE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
GAMMA-BHC (LINDANE)		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
GAMMA-CHLORDANE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
HEPTACHLOR		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
HEPTACHLOR EPOXIDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
METHOXYCHLOR		UG/L	0.10	U	U	0.10	U	U	0.10	U	U
TOXAPHENE		UG/L	2.0	U	U	2.0	U	U	2.0	U	U

Sample No:			5120			5130			5140		
Sample Location:			PB-WA-MW2			PB-PR-MW7			PB-PR-MW8		
Sample Date:			30-SEP-96			21-OCT-96			20-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:PEST/PCB-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
4,4'-DDD		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
4,4'-DDE		UG/L	0.050	U	U	7.9	GU	U	2.2	GU	U
4,4'-DDT		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
ALDRIN		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
ALPHA-BHC		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
ALPHA-CHLORDANE		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
AROCLOR 1016		UG/L	1.0	U	U	20	U	U	10	U	U
AROCLOR 1221		UG/L	1.0	U	U	20	U	U	10	U	U
AROCLOR 1232		UG/L	1.0	U	U	20	U	U	10	U	U
AROCLOR 1242		UG/L	1.0	U	U	20	U	U	10	U	U
AROCLOR 1248		UG/L	1.0	U	U	20	U	U	10	U	U
AROCLOR 1254		UG/L	1.0	U	U	20	U	U	10	U	U
AROCLOR 1260		UG/L	1.0	U	U	20	U	U	10	U	U
BETA-BHC		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
DELTA-BHC		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
DIELDRIN		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
ENDOSULFAN I		UG/L	0.050	U	U	1.0	U	U	2.6	GU	U
ENDOSULFAN II		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
ENDOSULFAN SULFATE		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
ENDRIN		UG/L	0.050	U	U	1.0	GU	U	0.50	U	U
ENDRIN ALDEHYDE		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
ENDRIN KETONE		UG/L	0.050	U	UJ	1.0	U	U	0.50	U	U
GAMMA-BHC (LINDANE)		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
GAMMA-CHLORDANE		UG/L	0.12	GU	U	1.0	U	U	0.50	U	U
HEPTACHLOR		UG/L	0.050	U	U	1.2	GU	U	0.50	U	U
HEPTACHLOR EPOXIDE		UG/L	0.050	U	U	1.0	U	U	0.50	U	U
METHOXYCHLOR		UG/L	0.10	U	U	2.0	U	UJ	1.0	U	UJ
TOXAPHENE		UG/L	2.0	U	U	40	U	U	20	U	U

Sample No:			5150			5160			5170		
Sample Location:			PB-PR-MW9			PB-BED-MW13			PB-BED-MW14		
Sample Date:			20-OCT-96			17-OCT-96			17-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:PEST/PCB-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
4,4'-DDD		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
4,4'-DDE		UG/L	0.16	GU	UJ	2.5	GU	U	0.067	GU	U
4,4'-DDT		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
ALDRIN		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
ALPHA-BHC		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
ALPHA-CHLORDANE		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
AROCLOR 1016		UG/L	1.0	U	UJ	50	GU	U	1.0	U	U
AROCLOR 1221		UG/L	1.0	U	UJ	50	GU	U	1.0	U	U
AROCLOR 1232		UG/L	1.0	U	UJ	50	GU	U	1.0	U	U
AROCLOR 1242		UG/L	1.0	U	UJ	50	GU	U	1.0	U	U
AROCLOR 1248		UG/L	1.0	U	UJ	50	GU	U	1.0	U	U
AROCLOR 1254		UG/L	1.0	U	UJ	50	GU	U	1.0	U	U
AROCLOR 1260		UG/L	1.0	U	UJ	50	GU	U	1.0	U	U
BETA-BHC		UG/L	0.050	U	UJ	2.5	GU	U	0.062	GU	U
DELTA-BHC		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
DIELDRIN		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
ENDOSULFAN I		UG/L	0.53	GU	UJ	2.5	GU	U	0.050	U	U
ENDOSULFAN II		UG/L	0.10	GU	UJ	2.5	GU	U	0.050	U	U
ENDOSULFAN SULFATE		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
ENDRIN		UG/L	0.28	GU	UJ	2.5	GU	U	0.050	U	U
ENDRIN ALDEHYDE		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
ENDRIN KETONE		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
GAMMA-BHC (LINDANE)		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
GAMMA-CHLORDANE		UG/L	0.050	U	UJ	2.5	GU	U	0.18	GU	U
HEPTACHLOR		UG/L	0.11	GU	UJ	2.5	GU	U	0.050	U	U
HEPTACHLOR EPOXIDE		UG/L	0.050	U	UJ	2.5	GU	U	0.050	U	U
METHOXYCHLOR		UG/L	0.10	U	UJ	5.0	GU	UJ	0.10	U	UJ
TOXAPHENE		UG/L	2.0	U	UJ	100	GU	U	2.0	U	U

Sample No:			5180			5200			5210		
Sample Location:			PB-BED-MW15			PB-BED-MW17			PB-BED-MW18		
Sample Date:			21-OCT-96			24-OCT-96			22-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:PEST/PCB-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
4,4'-DDD		UG/L	1.0	U	U	0.13	GU	UJ	0.20	GU	UJ
4,4'-DDE		UG/L	1.0	U	U	0.17	GU	U	0.050	U	U
4,4'-DDT		UG/L	1.0	U	U	0.12	GU	U	0.050	U	U
ALDRIN		UG/L	1.0	U	U	0.050	U	U	0.050	U	U
ALPHA-BHC		UG/L	1.0	U	U	0.062	GU	U	0.050	U	U
ALPHA-CHLORDANE		UG/L	1.0	U	U	0.070	GU	U	0.050	U	U
AROCLOR 1016		UG/L	20	U	U	1.0	U	U	1.0	U	U
AROCLOR 1221		UG/L	20	U	U	1.0	U	U	1.0	U	U
AROCLOR 1232		UG/L	20	U	U	1.0	U	U	1.0	U	U
AROCLOR 1242		UG/L	20	U	U	1.0	U	U	1.0	U	U
AROCLOR 1248		UG/L	20	U	U	1.0	U	U	1.0	U	U
AROCLOR 1254		UG/L	20	U	U	1.0	U	U	1.0	U	U
AROCLOR 1260		UG/L	20	U	U	1.0	U	U	1.0	U	U
BETA-BHC		UG/L	1.4	GU	U	0.050	U	U	0.050	U	U
DELTA-BHC		UG/L	1.0	U	U	0.18	GU	U	0.060	GU	U
DIELDRIN		UG/L	1.0	U	U	0.37	GU	U	0.10	GU	U
ENDOSULFAN I		UG/L	1.5	GU	U	0.49	GU	U	0.21	GU	U
ENDOSULFAN II		UG/L	1.0	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN SULFATE		UG/L	1.0	U	U	0.24	GU	U	0.47	GU	U
ENDRIN		UG/L	1.0	U	U	0.050	U	U	0.056	GU	U
ENDRIN ALDEHYDE		UG/L	1.0	U	U	0.050	U	U	0.050	U	U
ENDRIN KETONE		UG/L	1.0	U	U	0.050	U	U	0.050	U	U
GAMMA-BHC (LINDANE)		UG/L	1.0	U	U	0.54	GU	U	0.050	U	U
GAMMA-CHLORDANE		UG/L	2.7	GU	U	0.050	U	U	0.050	U	U
HEPTACHLOR		UG/L	1.0	U	U	0.050	U	U	0.050	U	U
HEPTACHLOR EPOXIDE		UG/L	1.0	U	U	0.050	U	U	0.050	U	U
METHOXYCHLOR		UG/L	2.0	U	UJ	0.10	U	UJ	0.10	U	UJ
TOXAPHENE		UG/L	40	U	U	2.0	U	U	2.0	U	U

Sample No:			5220			5230			5240		
Sample Location:			PB-BED-MW19			PB-BED-MW20			MK-MW10		
Sample Date:			17-OCT-96			23-OCT-96			27-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:PEST/PCB-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
4,4'-DDD		UG/L	2.5	GU	U	0.050	U	UJ	0.050	U	U
4,4'-DDE		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
4,4'-DDT		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
ALDRIN		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
ALPHA-BHC		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
ALPHA-CHLORDANE		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
AROCLOR 1016		UG/L	50	GU	U	1.0	U	U	1.0	U	U
AROCLOR 1221		UG/L	50	GU	U	1.0	U	U	1.0	U	U
AROCLOR 1232		UG/L	50	GU	U	1.0	U	U	1.0	U	U
AROCLOR 1242		UG/L	50	GU	U	1.0	U	U	1.0	U	U
AROCLOR 1248		UG/L	50	GU	U	1.0	U	U	1.0	U	U
AROCLOR 1254		UG/L	50	GU	U	1.0	U	U	1.0	U	U
AROCLOR 1260		UG/L	50	GU	U	1.0	U	U	1.0	U	U
BETA-BHC		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
DELTA-BHC		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
DIELDRIN		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
ENDOSULFAN I		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
ENDOSULFAN II		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
ENDOSULFAN SULFATE		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
ENDRIN		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
ENDRIN ALDEHYDE		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
ENDRIN KETONE		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
GAMMA-BHC (LINDANE)		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
GAMMA-CHLORDANE		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
HEPTACHLOR		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
HEPTACHLOR EPOXIDE		UG/L	2.5	GU	U	0.050	U	U	0.050	U	U
METHOXYCHLOR		UG/L	5.0	GU	U	0.10	U	UJ	0.10	U	U
TOXAPHENE		UG/L	100	GU	U	2.0	U	U	2.0	U	U

Sample No:			5250			5260			5270		
Sample Location:			MK-MW11			MK-MW16			MK-MW17		
Sample Date:			27-SEP-96			30-SEP-96			21-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:PEST/PCB-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
4,4'-DDD		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
4,4'-DDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
4,4'-DDT		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALPHA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALPHA-CHLORDANE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
AROCLOR 1016		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1221		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1232		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1242		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1248		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1254		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1260		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
BETA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
DELTA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
DIELDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN I		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN II		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN SULFATE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN ALDEHYDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN KETONE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
GAMMA-BHC (LINDANE)		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
GAMMA-CHLORDANE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
HEPTACHLOR		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
HEPTACHLOR EPOXIDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
METHOXYCHLOR		UG/L	0.10	U	U	0.10	U	U	0.10	U	UJ
TOXAPHENE		UG/L	2.0	U	U	2.0	U	U	2.0	U	U

Sample No:			5280			5300			5310		
Sample Location:			MK-MW22			MK-MW24			IT-MW02		
Sample Date:			22-OCT-96			22-OCT-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:PEST/PCB-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
4,4'-DDD		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
4,4'-DDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
4,4'-DDT		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALPHA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ALPHA-CHLORDANE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
AROCLOR 1016		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1221		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1232		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1242		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1248		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1254		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
AROCLOR 1260		UG/L	1.0	U	U	1.0	U	U	1.0	U	U
BETA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
DELTA-BHC		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
DIELDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDOSULFAN I		UG/L	0.056	GU	U	0.050	U	U	0.050	U	U
ENDOSULFAN II		UG/L	0.050	U	U	0.050	U	U	0.056	GU	U
ENDOSULFAN SULFATE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN ALDEHYDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
ENDRIN KETONE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
GAMMA-BHC (LINDANE)		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
GAMMA-CHLORDANE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
HEPTACHLOR		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
HEPTACHLOR EPOXIDE		UG/L	0.050	U	U	0.050	U	U	0.050	U	U
METHOXYCHLOR		UG/L	0.10	U	UJ	0.10	U	UJ	0.10	U	U
TOXAPHENE		UG/L	2.0	U	U	2.0	U	U	2.0	U	U

Sample No:			5320		
Sample Location:			IT-MW05		
Sample Date:			20-OCT-96		
Depth			0 - 0		
WELLS:PEST/PCB-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr
4,4'-DDD		UG/L	0.050	U	UJ
4,4'-DDE		UG/L	0.050	U	U
4,4'-DDT		UG/L	0.050	U	U
ALDRIN		UG/L	0.050	U	U
ALPHA-BHC		UG/L	0.050	U	U
ALPHA-CHLORDANE		UG/L	0.050	U	U
AROCLOR 1016		UG/L	1.0	U	U
AROCLOR 1221		UG/L	1.0	U	U
AROCLOR 1232		UG/L	1.0	U	U
AROCLOR 1242		UG/L	1.0	U	U
AROCLOR 1248		UG/L	1.0	U	U
AROCLOR 1254		UG/L	1.0	U	U
AROCLOR 1260		UG/L	1.0	U	U
BETA-BHC		UG/L	0.050	U	U
DELTA-BHC		UG/L	0.050	U	U
DIELDRIN		UG/L	0.050	U	U
ENDOSULFAN I		UG/L	0.050	U	U
ENDOSULFAN II		UG/L	0.050	U	U
ENDOSULFAN SULFATE		UG/L	0.050	U	U
ENDRIN		UG/L	0.050	U	U
ENDRIN ALDEHYDE		UG/L	0.050	U	U
ENDRIN KETONE		UG/L	0.050	U	U
GAMMA-BHC (LINDANE)		UG/L	0.050	U	U
GAMMA-CHLORDANE		UG/L	0.050	U	U
HEPTACHLOR		UG/L	0.050	U	U
HEPTACHLOR EPOXIDE		UG/L	0.050	U	U
METHOXYCHLOR		UG/L	0.10	U	UJ
TOXAPHENE		UG/L	2.0	U	U

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WELLS:METALS-W	Fltr	Units	5010 IT-MW06 18-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5030 IT-MW08 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5050 PB-TNTA-MW10 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ALUMINUM		MG/L	4.35		J	.468			.2	U	U
ALUMINUM	Y	MG/L	.2	U	U	.2	U	U	.2	U	U
ANTIMONY		MG/L	.06	U	U	.06	U	U	.06	U	U
ANTIMONY	Y	MG/L	.06	U	U	.06	U	U	.06	U	U
ARSENIC		MG/L	.0142			.01	U	U	.0122		
ARSENIC	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
BARIUM		MG/L	.264			.2	U	U	.229		
BARIUM	Y	MG/L	.2	U	U	.2	U	U	.212		
BERYLLIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
BERYLLIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CALCIUM		MG/L	124			373			250		
CALCIUM	Y	MG/L	130			362			238		
CHROMIUM		MG/L	.0221			.0153			.01	U	U
CHROMIUM	Y	MG/L	.01	U	U	.0171			.01		
COBALT		MG/L	.05	U	U	.05	U	U	.05	U	U
COBALT	Y	MG/L	.05	U	U	.05	U	U	.05	U	U
COPPER		MG/L	.025	U	U	.025	U	U	.0331		
COPPER	Y	MG/L	.025	U	U	.025	U	U	.025	U	U
IRON		MG/L	16.7			.997			26.2		
IRON	Y	MG/L	.1	U	U	.144			19.5		
LEAD		MG/L	.0216			.003	U	U	.003	U	U
LEAD	Y	MG/L	.0036			.003	U	U	.003	U	U
MAGNESIUM		MG/L	54		J	142		J	66.4		
MAGNESIUM	Y	MG/L	55.8			137			64.9		
MANGANESE		MG/L	2.96			.263			2.74		
MANGANESE	Y	MG/L	1.63			.211			2.58		
MERCURY		MG/L	.0002	U	U	.0002	U	U	.0002	U	U

WELLS:METALS-W	Fltr	Units	5060 PB-TNTA-MW11 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5070 PB-TNTC-MW3 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5080 PB-TNTC-MW4 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ALUMINUM		MG/L	1.92			9.54			6.59		
ALUMINUM	Y	MG/L	.2	U	U	.2	U	U	.2	U	U
ANTIMONY		MG/L	.06	U	U	.06	U	U	.06	U	U
ANTIMONY	Y	MG/L	.06	U	U	.06	U	U	.06	U	U
ARSENIC		MG/L	.0125			.0516			.0478		
ARSENIC	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
BARIUM		MG/L	.2	U	U	.286			.2	U	U
BARIUM	Y	MG/L	.2	U	U	.2	U	U	.2	U	U
BERYLLIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
BERYLLIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CALCIUM		MG/L	157			527			290		
CALCIUM	Y	MG/L	203			547			313		
CHROMIUM		MG/L	.0175			.0575			.0469		
CHROMIUM	Y	MG/L	.01	U	U	.015			.01	U	U
COBALT		MG/L	.05	U	U	.131			.05	U	U
COBALT	Y	MG/L	.05	U	U	.112			.05	U	U
COPPER		MG/L	.025	U	U	.0486			.0318		
COPPER	Y	MG/L	.025	U	U	.025	U	U	.025	U	U
IRON		MG/L	11.5			41.1			36.8		
IRON	Y	MG/L	.1	U	U	.1	U	U	.188		
LEAD		MG/L	.0129			.0477			.0364		
LEAD	Y	MG/L	.003	U	U	.0361			.0209		
MAGNESIUM		MG/L	64.1			211			150		
MAGNESIUM	Y	MG/L	87.3			216		J	168		J
MANGANESE		MG/L	.457			5.1			1.13		
MANGANESE	Y	MG/L	.526			5.3		J	.998		J
MERCURY		MG/L	.0002	U	U	.0002	U	U	.0002	U	U

WELLS:METALS-W	Fltr	Units	5090 PB-TNTC-MW5 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5100 PB-TNTC-MW6 02-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5110 PB-WA-MW1 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ALUMINUM		MG/L	1.96			2.66		J	1.6		
ALUMINUM	Y	MG/L	.2	U	U	.2	U	U	.2	U	U
ANTIMONY		MG/L	.06	U	U	.06	U	U	.06	U	U
ANTIMONY	Y	MG/L	.06	U	U	.06	U	U	.06	U	U
ARSENIC		MG/L	.01	U	U	.01	U	U	.01	U	U
ARSENIC	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
BARIUM		MG/L	.2	U	U	.2	U	U	.2	U	U
BARIUM	Y	MG/L	.2	U	U	.2	U	U	.2	U	U
BERYLLIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
BERYLLIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CALCIUM		MG/L	135			255			156		
CALCIUM	Y	MG/L	126			253			158		
CHROMIUM		MG/L	.0174			.0507			.0114		
CHROMIUM	Y	MG/L	.01	U	U	.0149			.01	U	U
COBALT		MG/L	.05	U	U	.05	U	U	.05	U	U
COBALT	Y	MG/L	.05	U	U	.05	U	U	.05	U	U
COPPER		MG/L	.025	U	U	.025	U	U	.025	U	U
COPPER	Y	MG/L	.025	U	U	.025	U	U	.025	U	U
IRON		MG/L	6.54			9.94			4.3		
IRON	Y	MG/L	.1	U	U	.146			.1	U	U
LEAD		MG/L	.0236			.018		U	.0052		
LEAD	Y	MG/L	.003	U	U	.0036			.003	U	U
MAGNESIUM		MG/L	53.1			17.8			65.2		
MAGNESIUM	Y	MG/L	51.7		J	16.8			62.1		J
MANGANESE		MG/L	.717			2.58			.342		
MANGANESE	Y	MG/L	.503		J	2.54			.364		J
MERCURY		MG/L	.0002	U	U	.0002	U	U	.0002	U	U

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WELLS:METALS-W	Fltr	Units	5120 PB-WA-MW2 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5130 PB-PR-MW7 21-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5140 PB-PR-MW8 20-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ALUMINUM		MG/L	13.4			2.55		J	.965		J
ALUMINUM	Y	MG/L	.2	U	U	.2	U	U	.859		
ANTIMONY		MG/L	.06	U	U	.06	U	U	.076		
ANTIMONY	Y	MG/L	.06	U	U	.06	U	U	.06	U	U
ARSENIC		MG/L	.011			.1	U	U	.5	U	U
ARSENIC	Y	MG/L	.01	U	U	.1	U	U	.5	U	U
BARIUM		MG/L	.2	U	U	.2	U	U	.2	U	U
BARIUM	Y	MG/L	.2	U	U	.2	U	U	.2	U	U
BERYLLIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
BERYLLIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM	Y	MG/L	.005	U	U	.005	U	U	.0072		
CALCIUM		MG/L	394			540			994		
CALCIUM	Y	MG/L	244			562			967		
CHROMIUM		MG/L	.0307			.0355			.149		
CHROMIUM	Y	MG/L	.0119			.0331			.15		
COBALT		MG/L	.114			2.25			6.34		
COBALT	Y	MG/L	.0662			2.24			6.48		
COPPER		MG/L	.0633			.964			4.68		
COPPER	Y	MG/L	.0312			.931		J	4.71		J
IRON		MG/L	26.8			6.01			13.3		
IRON	Y	MG/L	.138			1.15			13.2		
LEAD		MG/L	.0132			.03	U	U	.15	U	U
LEAD	Y	MG/L	.0046			.03	U	U	.15	U	U
MAGNESIUM		MG/L	143			180		J	424		J
MAGNESIUM	Y	MG/L	89.3		J	165			422		
MANGANESE		MG/L	1.54			13.6			30.7		
MANGANESE	Y	MG/L	.913		J	15.2			30.9		
MERCURY		MG/L	.0002	U	U	.0002	U	U	.0002	U	U

WELLS:METALS-W	Fltr	Units	5150 PB-PR-MW9 20-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5160 PB-BED-MW13 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5170 PB-BED-MW14 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ALUMINUM		MG/L	.2	U	U	.2	U	U	.2	U	U
ALUMINUM	Y	MG/L	.2	U	U	.2	U	U	.246		
ANTIMONY		MG/L	.0783			.06	U	U	.06	U	U
ANTIMONY	Y	MG/L	.06	U	U	.06	U	U	.06	U	U
ARSENIC		MG/L	.1	U	U	.05	U	U	.01	U	U
ARSENIC	Y	MG/L	.1	U	U	.05	U	U	.01	U	U
BARIUM		MG/L	.2	U	U	3.7			.2	U	U
BARIUM	Y	MG/L	.2	U	U	3.3			.2	U	U
BERYLLIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
BERYLLIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CALCIUM		MG/L	428			418			210		
CALCIUM	Y	MG/L	410			381			132		
CHROMIUM		MG/L	.0279			.0108			.0123		
CHROMIUM	Y	MG/L	.0266			.0134			.0116		
COBALT		MG/L	.762			.05	U	U	.0691		
COBALT	Y	MG/L	.692			.05	U	U	.0538		
COPPER		MG/L	.445			.025	U	U	.025	U	U
COPPER	Y	MG/L	.414		J	.025	U	U	.025	U	U
IRON		MG/L	1.75			.187			.45		
IRON	Y	MG/L	1.19			.1	U	U	.1	U	U
LEAD		MG/L	.03	U	U	.015	U	U	.003	U	U
LEAD	Y	MG/L	.03	U	U	.015	U	U	.003	U	U
MAGNESIUM		MG/L	178		J	308		J	125		J
MAGNESIUM	Y	MG/L	171			277			97.7		
MANGANESE		MG/L	2.28			.021			.0475		
MANGANESE	Y	MG/L	2.14			.016			.025		
MERCURY		MG/L	.0002	U	U	.0002	U	U	.0002	U	U

			5180 PB-BED-MW15 21-OCT-96 0 - 0			5190 PB-BED-MW16 25-OCT-96 0 - 0			5200 PB-BED-MW17 24-OCT-96 0 - 0		
WELLS:METALS-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
ALUMINUM		MG/L	.2	U	U	.387			.2	U	U
ALUMINUM	Y	MG/L	.2	U	U	9.44		R	.2	U	U
ANTIMONY		MG/L	.0776			.0931			.0614		
ANTIMONY	Y	MG/L	.0696			.06	U	U	.06	U	U
ARSENIC		MG/L	.05	U	U	.4	U	U	.01	U	U
ARSENIC	Y	MG/L	.05	U	U	.1	U	U	.0111		
BARIUM		MG/L	1.85			1.21			1.23		
BARIUM	Y	MG/L	2.39			.631		R	1.14		R
BERYLLIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
BERYLLIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CALCIUM		MG/L	459			17700			268		
CALCIUM	Y	MG/L	556			2530			238		
CHROMIUM		MG/L	.01	U	U	.0334			.01	U	U
CHROMIUM	Y	MG/L	.01	U	U	.0862		R	.01	U	U
COBALT		MG/L	.05	U	U	.05	U	U	.05	U	U
COBALT	Y	MG/L	.05	U	U	.05	U	U	.05	U	U
COPPER		MG/L	.025	U	U	.025	U	U	.025	U	U
COPPER	Y	MG/L	.025	U	U	.0593		R	.025	U	U
IRON		MG/L	.1	U	U	.1	U	U	.428		
IRON	Y	MG/L	.1	U	U	43.7		R	.1	U	U
LEAD		MG/L	.015	U	U	.12	U	U	.003	U	U
LEAD	Y	MG/L	.015	U	U	.0444			.003	U	U
MAGNESIUM		MG/L	358			361			234		
MAGNESIUM	Y	MG/L	443			81.6			219		
MANGANESE		MG/L	.0169			10.3			.0263		
MANGANESE	Y	MG/L	.0272			2.28		R	.015	U	U
MERCURY		MG/L	.0002	U	U	.0002	U	U	.0002	U	U

WELLS:METALS-W	Fltr	Units	5210 PB-BED-MW18 22-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5220 PB-BED-MW19 17-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5230 PB-BED-MW20 23-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ALUMINUM		MG/L	.317			.2	U	U	.548		
ALUMINUM	Y	MG/L	.2	U	U	.378			.2	U	U
ANTIMONY		MG/L	.109			.06	U	U	.0963		
ANTIMONY	Y	MG/L	.0668		R	.06	U	U	.0892		R
ARSENIC		MG/L	.2	U	U	.01	U	U	.4	U	U
ARSENIC	Y	MG/L	.2	U	U	.01	U	U	.4	U	U
BARIUM		MG/L	1.29			2.13			26.4		
BARIUM	Y	MG/L	1.16		R	1.94			24.9		R
BERYLLIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
BERYLLIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CALCIUM		MG/L	1610			228			2400		
CALCIUM	Y	MG/L	1480			210			2270		
CHROMIUM		MG/L	.01	U	U	.0138			.0149		
CHROMIUM	Y	MG/L	.01	U	U	.01	U	U	.01		R
COBALT		MG/L	.05	U	U	.05	U	U	.05	U	U
COBALT	Y	MG/L	.05	U	U	.05	U	U	.05	U	U
COPPER		MG/L	.025	U	U	.025	U	U	.025	U	U
COPPER	Y	MG/L	.025	U	U	.025	U	U	.025	U	U
IRON		MG/L	.358			.129			5.76		
IRON	Y	MG/L	.1	U	U	.1	U	U	4.16		R
LEAD		MG/L	.06	U	U	.003	U	U	.12	U	U
LEAD	Y	MG/L	.06	U	U	.003	U	U	.12	U	U
MAGNESIUM		MG/L	1050			117		J	1070		
MAGNESIUM	Y	MG/L	969			107			1020		
MANGANESE		MG/L	.131			.0205			.173		
MANGANESE	Y	MG/L	.0986		R	.0165			.161		R
MERCURY		MG/L	.00024			.0002	U	U	.0002	U	U

WELLS:METALS-W	Fltr	Units	5240 MK-MW10 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5250 MK-MW11 27-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5260 MK-MW16 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ALUMINUM		MG/L	11.1			1.97			3.76		
ALUMINUM	Y	MG/L	.2	U	U	.2	U	U	1.11		
ANTIMONY		MG/L	.06	U	U	.06	U	U	.06	U	U
ANTIMONY	Y	MG/L	.06	U	U	.06	U	U	.06	U	U
ARSENIC		MG/L	.01			.01	U	U	.01	U	U
ARSENIC	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
BARIUM		MG/L	.2	U	U	.2	U	U	.2	U	U
BARIUM	Y	MG/L	.2	U	U	.2	U	U	.2	U	U
BERYLLIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
BERYLLIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CALCIUM		MG/L	108			185			183		
CALCIUM	Y	MG/L	82.3			159			197		
CHROMIUM		MG/L	.0247			.0121			.0106		
CHROMIUM	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
COBALT		MG/L	.05	U	U	.05	U	U	.05	U	U
COBALT	Y	MG/L	.05	U	U	.05	U	U	.0959		
COPPER		MG/L	.0318			.025	U	U	.0262		
COPPER	Y	MG/L	.025	U	U	.025	U	U	.0489		
IRON		MG/L	26.5			8.02			12.1		
IRON	Y	MG/L	.1	U	U	.1	U	U	.391		
LEAD		MG/L	.0439			.0376			.0348		
LEAD	Y	MG/L	.003	U	U	.0097			.003	U	U
MAGNESIUM		MG/L	34.1			47.1			68.4		
MAGNESIUM	Y	MG/L	22.3		J	41.4		J	71.1		J
MANGANESE		MG/L	.412			.978			12		
MANGANESE	Y	MG/L	.0235		J	.015	U	U	11.6		J
MERCURY		MG/L	.0002	U	U	.0002	U	U	.0002	U	U

WELLS:METALS-W	Fltr	Units	5270 MK-MW17 21-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5280 MK-MW22 22-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5290 MK-MW23 23-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ALUMINUM		MG/L	.658			2.04					
ALUMINUM	Y	MG/L	.2	U	U	.2	U	U	.2	U	U
ANTIMONY		MG/L	.06	U	U	.06	U	U			
ANTIMONY	Y	MG/L	.06	U	U	.06	U	U	.0616		R
ARSENIC		MG/L	.0102			.01	U	U			
ARSENIC	Y	MG/L	.0114			.01	U	U	.0104		
BARIUM		MG/L	.2	U	U	.2	U	U			
BARIUM	Y	MG/L	.2	U	U	.2	U	U	.2	U	U
BERYLLIUM		MG/L	.005	U	U	.005	U	U			
BERYLLIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM		MG/L	.005	U	U	.005	U	U			
CADMIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CALCIUM		MG/L	124			185					
CALCIUM	Y	MG/L	145			129			135		
CHROMIUM		MG/L	.01	U	U	.01	U	U			
CHROMIUM	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
COBALT		MG/L	.0785			.05	U	U			
COBALT	Y	MG/L	.0795			.05	U	U	.05	U	U
COPPER		MG/L	.025	U	U	.025	U	U			
COPPER	Y	MG/L	.025	U	U	.025	U	U	.025	U	U
IRON		MG/L	34.8			4.52					
IRON	Y	MG/L	38.3			.1	U	U	.1	U	U
LEAD		MG/L	.0034			.0076					
LEAD	Y	MG/L	.003	U	U	.003	U	U	.003	U	U
MAGNESIUM		MG/L	29.9			28.9					
MAGNESIUM	Y	MG/L	35.1			21.8			50.4		
MANGANESE		MG/L	1.43			.643					
MANGANESE	Y	MG/L	1.68			.269			.327		R
MERCURY		MG/L	.0002	U	U	.0002	U	U			

WELLS:METALS-W	Fltr	Units	5300 MK-MW24 22-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5310 IT-MW02 30-SEP-96 0 - 0 Result	Lab Qlfr	Val Qlfr	5320 IT-MW05 20-OCT-96 0 - 0 Result	Lab Qlfr	Val Qlfr
ALUMINUM		MG/L	1.21			.431			1.52		J
ALUMINUM	Y	MG/L	.2	U	U	.2	U	U	.248		
ANTIMONY		MG/L	.06	U	U	.06	U	U	.06	U	U
ANTIMONY	Y	MG/L	.06	U	U	.06	U	U	.06	U	U
ARSENIC		MG/L	.01	U	U	.01	U	U	.0136		
ARSENIC	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
BARIUM		MG/L	.2	U	U	.2	U	U	.277		
BARIUM	Y	MG/L	.2	U	U	.2	U	U	.236		
BERYLLIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
BERYLLIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
CADMIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
CALCIUM		MG/L	629			151			156		
CALCIUM	Y	MG/L	681			157			132		
CHROMIUM		MG/L	.0162			.01	U	U	.0116		
CHROMIUM	Y	MG/L	.0133		R	.01	U	U	.01	U	U
COBALT		MG/L	.05	U	U	.0688			.05	U	U
COBALT	Y	MG/L	.05	U	U	.0726			.05	U	U
COPPER		MG/L	.025	U	U	.0451			.025	U	U
COPPER	Y	MG/L	.025	U	U	.0502			.025	U	UJ
IRON		MG/L	4.72			1.12			7.84		
IRON	Y	MG/L	1.4		R	.1	U	U	.1	U	U
LEAD		MG/L	.004			.0277			.0057		U
LEAD	Y	MG/L	.003	U	U	.0284			.0052		
MAGNESIUM		MG/L	31.3			65.4			48.5		J
MAGNESIUM	Y	MG/L	35			67.5		J	45.6		
MANGANESE		MG/L	.348			1.23			.459		
MANGANESE	Y	MG/L	.377		R	1.19		J	.195		
MERCURY		MG/L	.0002	U	U	.0002	U	U	.0002	U	U

Sample No:			5010			5030			5050		
Sample Location:			IT-MW06			IT-MW08			PB-TNTA-MW10		
Sample Date:			18-OCT-96			17-OCT-96			27-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:METALS-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
MERCURY	Y	MG/L	.0002	U	U	.0002	U	U	.0002	U	U
NICKEL		MG/L	.04	U	U	.04	U	U	.04	U	U
NICKEL	Y	MG/L	.04	U	U	.04	U	U	.04	U	U
POTASSIUM		MG/L	12.7			15.7			6.29		
POTASSIUM	Y	MG/L	14.8			15.3			6.52		
SELENIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
SELENIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
SILVER		MG/L	.01	U	U	.01	U	U	.01	U	U
SILVER	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
SODIUM		MG/L	24.7			19.8		J	41.6		
SODIUM	Y	MG/L	32.8		J	19		J	41.9		
THALLIUM		MG/L	.01	U	U	.01	U	U	.01	U	U
THALLIUM	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
VANADIUM		MG/L	.05	U	U	.0574			.05	U	U
VANADIUM	Y	MG/L	.05	U	U	.0625			.05	U	U
ZINC		MG/L	.126			.0624		UJ	.036		
ZINC	Y	MG/L	.0479			.0334			.0263		

PLUMBROOK
Wells
Data Summary - Ground Water

Report Date: 04/07/97

Sample No:			5060			5070			5080		
Sample Location:			PB-TNTA-MW11			PB-TNTC-MW3			PB-TNTC-MW4		
Sample Date:			27-SEP-96			27-SEP-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:METALS-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
MERCURY	Y	MG/L	.0002	U	U	.0002	U	U	.0002	U	U
NICKEL		MG/L	.04	U	U	.198			.0466		
NICKEL	Y	MG/L	.04	U	U	.17			.04	U	U
POTASSIUM		MG/L	19.4			25.3			28.1		
POTASSIUM	Y	MG/L	27			23.7			30.6		
SELENIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
SELENIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
SILVER		MG/L	.01	U	U	.01	U	U	.01	U	U
SILVER	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
SODIUM		MG/L	101			77		J	79.2		J
SODIUM	Y	MG/L	142			78.9			92.3		
THALLIUM		MG/L	.01	U	U	.01	U	U	.01	U	U
THALLIUM	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
VANADIUM		MG/L	.05	U	U	.0877			.0701		
VANADIUM	Y	MG/L	.05	U	U	.0686			.0525		
ZINC		MG/L	.0791			.133			.112		
ZINC	Y	MG/L	.02	U	U	.0419			.032		

Sample No:			5090			5100			5110		
Sample Location:			PB-TNTC-MW5			PB-TNTC-MW6			PB-WA-MW1		
Sample Date:			30-SEP-96			02-OCT-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:METALS-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
MERCURY	Y	MG/L	.0002	U	U	.0002	U	U	.0002	U	U
NICKEL		MG/L	.04	U	U	.04	U	U	.04	U	U
NICKEL	Y	MG/L	.04	U	U	.04	U	U	.04	U	U
POTASSIUM		MG/L	16.4			14.1			5	U	U
POTASSIUM	Y	MG/L	15.9			14.5			5	U	U
SELENIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
SELENIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
SILVER		MG/L	.01	U	U	.01	U	UJ	.01	U	U
SILVER	Y	MG/L	.01	U	U	.01	U	UJ	.01	U	U
SODIUM		MG/L	178		J	17.2			15.2		J
SODIUM	Y	MG/L	178			17.3			14.3		
THALLIUM		MG/L	.01	U	U	.01	U	U	.01	U	U
THALLIUM	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
VANADIUM		MG/L	.05	U	U	.05	U	U	.05	U	U
VANADIUM	Y	MG/L	.05	U	U	.05	U	U	.05	U	U
ZINC		MG/L	.0489			.0831		U	.0663		
ZINC	Y	MG/L	.045			.0329		U	.0446		

Sample No:			5120			5130			5140		
Sample Location:			PB-WA-MW2			PB-PR-MW7			PB-PR-MW8		
Sample Date:			30-SEP-96			21-OCT-96			20-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:METALS-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
MERCURY	Y	MG/L	.0002	U	U	.0002	U	U	.0002	U	U
NICKEL		MG/L	.207			1.69			6.08		
NICKEL	Y	MG/L	.123			1.63		J	6.23		J
POTASSIUM		MG/L	23.7			11.8			35.4		
POTASSIUM	Y	MG/L	13.8			8.31			35.1		
SELENIUM		MG/L	.0079			.05	U	U	.25	U	U
SELENIUM	Y	MG/L	.006			.05	U	U	.25	U	U
SILVER		MG/L	.01	U	U	.01	U	U	.01	U	U
SILVER	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
SODIUM		MG/L	731		J	3200			11200		
SODIUM	Y	MG/L	528			3380			11500		
THALLIUM		MG/L	.01	U	U	.1	U	U	.5	U	U
THALLIUM	Y	MG/L	.01	U	U	.1	U	U	.5	U	U
VANADIUM		MG/L	.0705			.0628			.0652		
VANADIUM	Y	MG/L	.05	U	U	.0683			.0673		
ZINC		MG/L	.107			.119			.155		U
ZINC	Y	MG/L	.0245			.0859			.183		

Sample No:			5150			5160			5170		
Sample Location:			PB-PR-MW9			PB-BED-MW13			PB-BED-MW14		
Sample Date:			20-OCT-96			17-OCT-96			17-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:METALS-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
MERCURY	Y	MG/L	.0002	U	U	.0002	U	U	.00025		
NICKEL		MG/L	1.06			.04	U	U	.0681		
NICKEL	Y	MG/L	.963		J	.04	U	U	.0535		
POTASSIUM		MG/L	17.1			79			38.3		
POTASSIUM	Y	MG/L	16.7			71.1			64.5		
SELENIUM		MG/L	.05	U	U	.025	U	U	.005	U	U
SELENIUM	Y	MG/L	.05	U	U	.025	U	U	.005	U	U
SILVER		MG/L	.01	U	U	.01	U	U	.01	U	U
SILVER	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
SODIUM		MG/L	1960			1080		J	471		J
SODIUM	Y	MG/L	1710			1010		J	346		J
THALLIUM		MG/L	.1	U	U	.05	U	U	.01	U	U
THALLIUM	Y	MG/L	.1	U	U	.05	U	U	.01	U	U
VANADIUM		MG/L	.0589			.0524			.05	U	U
VANADIUM	Y	MG/L	.0566			.0553			.05	U	U
ZINC		MG/L	.201		U	.0349		UJ	.036		UJ
ZINC	Y	MG/L	.674			.0402			.026		

Sample No:			5180			5190			5200		
Sample Location:			PB-BED-MW15			PB-BED-MW16			PB-BED-MW17		
Sample Date:			21-OCT-96			25-OCT-96			24-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:METALS-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
MERCURY	Y	MG/L	.0002	U	U	.0002	U	U	.0002	U	U
NICKEL		MG/L	.04	U	U	.04	U	U	.04	U	U
NICKEL	Y	MG/L	.04	U	U	.049		R	.04	U	U
POTASSIUM		MG/L	78			82			51.3		
POTASSIUM	Y	MG/L	104			97.7		R	48.1		R
SELENIUM		MG/L	.025	U	U	.2	U	U	.005	U	U
SELENIUM	Y	MG/L	.025	U	U	.05	U	U	.005	U	U
SILVER		MG/L	.01	U	U	.01	U	U	.01	U	U
SILVER	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
SODIUM		MG/L	945		R	264			405		
SODIUM	Y	MG/L	1320		R	249		R	376		R
THALLIUM		MG/L	.05	U	U	.4	U	U	.01	U	U
THALLIUM	Y	MG/L	.05	U	U	.1	U	U	.01	U	U
VANADIUM		MG/L	.05	U	U	.362			.05	U	U
VANADIUM	Y	MG/L	.05	U	U	.14			.05	U	U
ZINC		MG/L	.0228			.0735			.02	U	U
ZINC	Y	MG/L	.0228			.258		R	.02	U	U

PLUMBROOK
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Sample No:			5210			5220			5230		
Sample Location:			PB-BED-MW18			PB-BED-MW19			PB-BED-MW20		
Sample Date:			22-OCT-96			17-OCT-96			23-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:METALS-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
MERCURY	Y	MG/L	.0002	U	U	.0002	U	U	.0002	U	U
NICKEL		MG/L	.04	U	U	.04	U	U	.04	U	U
NICKEL	Y	MG/L	.04	U	U	.04	U	U	.04	U	U
POTASSIUM		MG/L	211			37.4			101		
POTASSIUM	Y	MG/L	189		R	32.3			95.6		R
SELENIUM		MG/L	.1	U	U	.005	U	U	.2	U	U
SELENIUM	Y	MG/L	.1	U	U	.005	U	U	.2	U	U
SILVER		MG/L	.01	U	U	.01	U	U	.01	U	U
SILVER	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
SODIUM		MG/L	4490		R	162		J	9070		R
SODIUM	Y	MG/L	4140		R	147		J	8680		R
THALLIUM		MG/L	.2	U	U	.01	U	U	.4	U	U
THALLIUM	Y	MG/L	.2	U	U	.01	U	U	.4	U	U
VANADIUM		MG/L	.05	U	U	.05	U	U	.0594		
VANADIUM	Y	MG/L	.05	U	U	.05	U	U	.0618		
ZINC		MG/L	.0367			.03		J	.0243		
ZINC	Y	MG/L	.02	U	U	.02	U	U	.0214		R

Sample No:			5240			5250			5260		
Sample Location:			MK-MW10			MK-MW11			MK-MW16		
Sample Date:			27-SEP-96			27-SEP-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:METALS-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
MERCURY	Y	MG/L	.0002	U	U	.0002	U	U	.0002	U	U
NICKEL		MG/L	.04	U	U	.04	U	U	.114		
NICKEL	Y	MG/L	.04	U	U	.04	U	U	.148		
POTASSIUM		MG/L	5	U	U	5	U	U	5	U	U
POTASSIUM	Y	MG/L	5	U	U	5	U	U	5	U	U
SELENIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
SELENIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
SILVER		MG/L	.01	U	U	.01	U	U	.01	U	U
SILVER	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
SODIUM		MG/L	5	U	UJ	10.6		J	9.01		J
SODIUM	Y	MG/L	5	U	U	11.3			10.6		
THALLIUM		MG/L	.01	U	U	.01	U	U	.01	U	U
THALLIUM	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
VANADIUM		MG/L	.05	U	U	.05	U	U	.05	U	U
VANADIUM	Y	MG/L	.05	U	U	.05	U	U	.05	U	U
ZINC		MG/L	.0974			.0454			.0954		
ZINC	Y	MG/L	.032			.0441			.121		

PLUMBROOK
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Sample No:			5270			5280			5290		
Sample Location:			MK-MW17			MK-MW22			MK-MW23		
Sample Date:			21-OCT-96			22-OCT-96			23-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:METALS-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
MERCURY	Y	MG/L	.0002	U	U	.0002	U	U	.0002	U	U
NICKEL		MG/L	.156			.04	U	U			
NICKEL	Y	MG/L	.182			.04	U	U	.0663		R
POTASSIUM		MG/L	5	U	U	5	U	U			
POTASSIUM	Y	MG/L	5	U	U	5	U	U	8.68		R
SELENIUM		MG/L	.005	U	U	.005	U	U			
SELENIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
SILVER		MG/L	.01	U	U	.01	U	U			
SILVER	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
SODIUM		MG/L	5.98			10.9					
SODIUM	Y	MG/L	7.14			13.1			71.7		R
THALLIUM		MG/L	.01	U	U	.01	U	U			
THALLIUM	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
VANADIUM		MG/L	.05	U	U	.05	U	U			
VANADIUM	Y	MG/L	.05	U	U	.05	U	U	.05	U	U
ZINC		MG/L	.119			.089					
ZINC	Y	MG/L	.114			.0248			.0206		R

Sample No:			5300			5310			5320		
Sample Location:			MK-MW24			IT-MW02			IT-MW05		
Sample Date:			22-OCT-96			30-SEP-96			20-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:METALS-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
MERCURY	Y	MG/L	.0002	U	U	.0002	U	U	.0002	U	U
NICKEL		MG/L	.04	U	U	.0498			.04	U	U
NICKEL	Y	MG/L	.04	U	U	.0503			.04	U	UJ
POTASSIUM		MG/L	5	U	U	5	U	U	5	U	U
POTASSIUM	Y	MG/L	5	U	U	5	U	U	5	U	U
SELENIUM		MG/L	.005	U	U	.005	U	U	.005	U	U
SELENIUM	Y	MG/L	.005	U	U	.005	U	U	.005	U	U
SILVER		MG/L	.01	U	U	.01	U	U	.01	U	U
SILVER	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
SODIUM		MG/L	5.93			286		J	23.6		
SODIUM	Y	MG/L	6.52		R	291			23.6		
THALLIUM		MG/L	.01	U	U	.01	U	U	.01	U	U
THALLIUM	Y	MG/L	.01	U	U	.01	U	U	.01	U	U
VANADIUM		MG/L	.0682			.05	U	U	.05	U	U
VANADIUM	Y	MG/L	.0676			.05	U	U	.05	U	U
ZINC		MG/L	.126			.0322			.0362		U
ZINC	Y	MG/L	.02	U	U	.071			.02	U	U

Sample No:			5010			5030			5050		
Sample Location:			IT-MW06			IT-MW08			PB-TNTA-MW10		
Sample Date:			18-OCT-96			17-OCT-96			27-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:EXPLOSIVES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
1,3,5-TRINITROBENZENE	Y	UG/L							0.20	U	U
1,3-DINITROBENZENE		UG/L	0.21	B	U	0.20	U	U	0.20	U	U
1,3-DINITROBENZENE	Y	UG/L							0.20	U	U
2,4,6-TRINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2,4,6-TRINITROTOLUENE	Y	UG/L							0.20	U	U
2,4-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2,4-DINITROTOLUENE	Y	UG/L							0.20	U	U
2,6-DINITROTOLUENE		UG/L	0.22			0.20	U	U	0.20	U	U
2,6-DINITROTOLUENE	Y	UG/L							0.20	U	U
2-NITROTOLUENE		UG/L	0.59	X1 B	UJ	0.20	U	U	0.20	U	U
2-NITROTOLUENE	Y	UG/L							0.20	U	U
3-NITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	1.2	X1	J
3-NITROTOLUENE	Y	UG/L							0.20	U	U
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L							0.20	U	U
HMX		UG/L	0.50	U	U	0.50	U	U	0.50	U	U
HMX	Y	UG/L							0.50	U	U
NITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
NITROBENZENE	Y	UG/L							0.20	U	U
RDX		UG/L	0.50	U	U	0.50	U	U	0.50	U	U
RDX	Y	UG/L							0.50	U	U
TETRYL		UG/L	0.41			0.20	U	U	0.20	U	U
TETRYL	Y	UG/L							0.20	U	U

Sample No:			5060			5070			5080		
Sample Location:			PB-TNTA-MW11			PB-TNTC-MW3			PB-TNTC-MW4		
Sample Date:			27-SEP-96			27-SEP-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:EXPLOSIVES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.40	U	UJ
1,3,5-TRINITROBENZENE	Y	UG/L	0.20	U	U						
1,3-DINITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.40	U	UJ
1,3-DINITROBENZENE	Y	UG/L	0.20	U	U						
2,4,6-TRINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.40	U	UJ
2,4,6-TRINITROTOLUENE	Y	UG/L	0.20	U	U						
2,4-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.40	U	UJ
2,4-DINITROTOLUENE	Y	UG/L	0.20	U	U						
2,6-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.40	U	UJ
2,6-DINITROTOLUENE	Y	UG/L	0.20	U	U						
2-NITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.40	U	UJ
2-NITROTOLUENE	Y	UG/L	0.20	U	U						
3-NITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.40	U	UJ
3-NITROTOLUENE	Y	UG/L	0.20	U	U						
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.40	U	UJ
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.20	U	U						
HMX		UG/L	0.50	U	U	1.2	GU	U	2.0	GU	UJ
HMX	Y	UG/L	0.50	U	U						
NITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.40	U	UJ
NITROBENZENE	Y	UG/L	0.20	U	U						
RDX		UG/L	0.50	U	U	0.50	U	U	1.0	U	UJ
RDX	Y	UG/L	0.50	U	U						
TETRYL		UG/L	0.20	U	U	0.20	U	U	0.40	U	UJ
TETRYL	Y	UG/L	0.20	U	U						

Sample No:			5090			5100			5110		
Sample Location:			PB-TNTC-MW5			PB-TNTC-MW6			PB-WA-MW1		
Sample Date:			30-SEP-96			02-OCT-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:EXPLOSIVES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
1,3,5-TRINITROBENZENE	Y	UG/L									
1,3-DINITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
1,3-DINITROBENZENE	Y	UG/L									
2,4,6-TRINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2,4,6-TRINITROTOLUENE	Y	UG/L									
2,4-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2,4-DINITROTOLUENE	Y	UG/L									
2,6-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2,6-DINITROTOLUENE	Y	UG/L									
2-NITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2-NITROTOLUENE	Y	UG/L									
3-NITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
3-NITROTOLUENE	Y	UG/L									
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L									
HMX		UG/L	0.50	U	U	0.50	U	U	1.1	GU	U
HMX	Y	UG/L									
NITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
NITROBENZENE	Y	UG/L									
RDX		UG/L	0.50	U	U	0.50	U	U	0.50	U	U
RDX	Y	UG/L									
TETRYL		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
TETRYL	Y	UG/L									

Sample No:			5120			5130			5140		
Sample Location:			PB-WA-MW2			PB-PR-MW7			PB-PR-MW8		
Sample Date:			30-SEP-96			21-OCT-96			20-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:EXPLOSIVES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	11			2000			1700		
1,3,5-TRINITROBENZENE	Y	UG/L				2400			2100		J
1,3-DINITROBENZENE		UG/L	18			1400			1400		
1,3-DINITROBENZENE	Y	UG/L				1600			1700		J
2,4,6-TRINITROTOLUENE		UG/L	2.4			200	U	U	200	U	U
2,4,6-TRINITROTOLUENE	Y	UG/L				100	U	U	160		J
2,4-DINITROTOLUENE		UG/L	12			1100			1400		
2,4-DINITROTOLUENE	Y	UG/L				1400			1400		J
2,6-DINITROTOLUENE		UG/L	1.0	U	U	310			200	U	U
2,6-DINITROTOLUENE	Y	UG/L				300			100	U	UJ
2-NITROTOLUENE		UG/L	1.0	U	U	200	U	U	200	U	U
2-NITROTOLUENE	Y	UG/L				100	U	U	100	U	UJ
3-NITROTOLUENE		UG/L	1.0	U	U	200	U	U	200	U	U
3-NITROTOLUENE	Y	UG/L				100	U	U	100	U	UJ
4-AMINO-2,6-DINITROTOLUENE		UG/L	1.1			200	U	U	200	U	U
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L				100	U	U	260	GU	UJ
HMX		UG/L	2.5	U	U	500	U	U	500	U	U
HMX	Y	UG/L				290	GU	U	250	U	UJ
NITROBENZENE		UG/L	1.0	U	U	200	U	U	200	U	U
NITROBENZENE	Y	UG/L				140	GU	U	180	GU	UJ
RDX		UG/L	2.5	U	U	500	U	U	500	U	U
RDX	Y	UG/L				310			630		J
TETRYL		UG/L	13	GU	U	200	U	U	200	U	U
TETRYL	Y	UG/L				100	U	U	100	U	UJ

Sample No:			5150			5160			5170		
Sample Location:			PB-PR-MW9			PB-BED-MW13			PB-BED-MW14		
Sample Date:			20-OCT-96			17-OCT-96			17-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:EXPLOSIVES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	27			0.20	U	U	1.0	U	U
1,3,5-TRINITROBENZENE	Y	UG/L				0.20	U	U	4.0	U	U
1,3-DINITROBENZENE		UG/L	57			0.22			1.0	U	U
1,3-DINITROBENZENE	Y	UG/L				0.20			4.0	U	U
2,4,6-TRINITROTOLUENE		UG/L	4.0	U	U	0.20	U	U	1.0	U	U
2,4,6-TRINITROTOLUENE	Y	UG/L				0.20	U	U	4.0	U	U
2,4-DINITROTOLUENE		UG/L	36			0.20	U	U	1.0	U	U
2,4-DINITROTOLUENE	Y	UG/L				0.20	U	U	4.0	U	U
2,6-DINITROTOLUENE		UG/L	4.0	U	U	0.66			1.0	U	U
2,6-DINITROTOLUENE	Y	UG/L				0.49	GU	U	4.0	U	U
2-NITROTOLUENE		UG/L	4.0	U	U	0.34	X1 B	UJ	1.0	U	U
2-NITROTOLUENE	Y	UG/L				0.20	U	U	4.0	U	U
3-NITROTOLUENE		UG/L	4.0	U	U	0.20	U	U	1.0	U	U
3-NITROTOLUENE	Y	UG/L				0.20	U	U	4.0	U	U
4-AMINO-2,6-DINITROTOLUENE		UG/L	24	GU	U	4.4			1.0	U	U
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L				3.9			4.0	U	U
HMX		UG/L	53	GU	U	0.50	U	U	2.5	U	U
HMX	Y	UG/L				0.50	U	U	10	U	U
NITROBENZENE		UG/L	13	GU	U	0.50			1.0	U	U
NITROBENZENE	Y	UG/L				0.20	U	U	4.0	U	U
RDX		UG/L	10	U	U	0.50	U	U	2.5	U	U
RDX	Y	UG/L				0.50	U	U	10	U	U
TETRYL		UG/L	4.0	U	U	1.8	B		1.0	U	U
TETRYL	Y	UG/L				0.96	GU	U	4.0	U	U

Sample No:			5180			5190			5200		
Sample Location:			PB-BED-MW15			PB-BED-MW16			PB-BED-MW17		
Sample Date:			21-OCT-96			25-OCT-96			24-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:EXPLOSIVES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.52			1.0	U	U	0.40	U	U
1,3,5-TRINITROBENZENE	Y	UG/L	0.80			1.0	U	U	0.20	U	U
1,3-DINITROBENZENE		UG/L	0.44			1.0	U	U	0.40	U	U
1,3-DINITROBENZENE	Y	UG/L	0.66			1.0	U	U	0.20	U	U
2,4,6-TRINITROTOLUENE		UG/L	0.40	U	U	1.0	U	U	0.40	U	U
2,4,6-TRINITROTOLUENE	Y	UG/L	0.40	U	U	1.0	U	U	0.20	U	U
2,4-DINITROTOLUENE		UG/L	0.40	U	U	1.0	U	U	0.40	U	U
2,4-DINITROTOLUENE	Y	UG/L	0.40	U	U	1.0	U	U	0.20	U	U
2,6-DINITROTOLUENE		UG/L	0.53	GU	U	1.4			0.40	U	U
2,6-DINITROTOLUENE	Y	UG/L	2.5	GU	U	1.9			2.7	GU	U
2-NITROTOLUENE		UG/L	0.40	U	U	1.0	U	U	0.72	X1	J
2-NITROTOLUENE	Y	UG/L	0.40	U	U	1.0	U	U	0.47	X1	J
3-NITROTOLUENE		UG/L	0.40	U	U	1.0	U	U	0.40	U	U
3-NITROTOLUENE	Y	UG/L	0.40	U	U	1.0	U	U	0.20	U	U
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.40	U	U	10	GU	U	5.8	GU	U
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.40	U	U	9.1	GU	U	2.3	GU	U
HMX		UG/L	1.0	U	U	2.5	U	U	1.0	U	U
HMX	Y	UG/L	1.0	U	U	2.5	U	U	0.50	U	U
NITROBENZENE		UG/L	0.40	U	U	1.0	U	U	0.50		
NITROBENZENE	Y	UG/L	0.40	U	U	1.0	U	U	0.51		
RDX		UG/L	3.7			2.5	U	U	1.0	U	U
RDX	Y	UG/L	6.3			2.5	U	U	0.50	U	U
TETRYL		UG/L	1.7			1.0	U	U	0.74		
TETRYL	Y	UG/L	2.3			1.6			0.20	U	U

Sample No:			5210			5220			5230		
Sample Location:			PB-BED-MW18			PB-BED-MW19			PB-BED-MW20		
Sample Date:			22-OCT-96			17-OCT-96			23-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:EXPLOSIVES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
1,3,5-TRINITROBENZENE	Y	UG/L	2.0	U	U	0.20	U	U	0.20	U	U
1,3-DINITROBENZENE		UG/L	0.31			0.20	U	U	0.20	U	U
1,3-DINITROBENZENE	Y	UG/L	2.0	U	U	0.20	U	U	0.20	U	U
2,4,6-TRINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2,4,6-TRINITROTOLUENE	Y	UG/L	2.0	U	U	0.20	U	U	0.20	U	U
2,4-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2,4-DINITROTOLUENE	Y	UG/L	2.0	U	U	0.20	U	U	0.20	U	U
2,6-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2,6-DINITROTOLUENE	Y	UG/L	2.0	U	U	0.20	U	U	0.20	U	U
2-NITROTOLUENE		UG/L	0.33	X1	J	0.20	U	U	0.20	U	U
2-NITROTOLUENE	Y	UG/L	2.0	U	U	0.20	U	U	0.20	U	U
3-NITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
3-NITROTOLUENE	Y	UG/L	2.0	U	U	0.20	U	U	0.20	U	U
4-AMINO-2,6-DINITROTOLUENE		UG/L	4.0			0.32	GU	U	0.20	U	U
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	21			0.25	GU	U	0.20	U	U
HMX		UG/L	0.50	U	U	0.50	U	U	0.50	U	U
HMX	Y	UG/L	5.0	U	U	0.50	U	U	0.50	U	U
NITROBENZENE		UG/L	0.20	U	U	0.50			0.20	U	U
NITROBENZENE	Y	UG/L	2.0	U	U	0.40			0.20	U	U
RDX		UG/L	0.50	U	U	0.50	U	U	0.50	U	U
RDX	Y	UG/L	5.0	U	U	0.50	U	U	0.50	U	U
TETRYL		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
TETRYL	Y	UG/L	2.0	U	U	0.20	U	U	0.20	U	U

Sample No:			5240			5250			5260		
Sample Location:			MK-MW10			MK-MW11			MK-MW16		
Sample Date:			27-SEP-96			27-SEP-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:EXPLOSIVES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
1,3,5-TRINITROBENZENE	Y	UG/L									
1,3-DINITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
1,3-DINITROBENZENE	Y	UG/L									
2,4,6-TRINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2,4,6-TRINITROTOLUENE	Y	UG/L									
2,4-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2,4-DINITROTOLUENE	Y	UG/L									
2,6-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2,6-DINITROTOLUENE	Y	UG/L									
2-NITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
2-NITROTOLUENE	Y	UG/L									
3-NITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
3-NITROTOLUENE	Y	UG/L									
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L									
HMX		UG/L	0.50	U	U	1.1	GU	U	0.50	U	U
HMX	Y	UG/L									
NITROBENZENE		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
NITROBENZENE	Y	UG/L									
RDX		UG/L	0.50	U	U	0.50	U	U	0.50	U	U
RDX	Y	UG/L									
TETRYL		UG/L	0.20	U	U	0.20	U	U	0.20	U	U
TETRYL	Y	UG/L									

Sample No:			5270			5280			5290		
Sample Location:			MK-MW17			MK-MW22			MK-MW23		
Sample Date:			21-OCT-96			22-OCT-96			23-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:EXPLOSIVES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	2.0	U	U	0.34	X1	J	0.20	U	U
1,3,5-TRINITROBENZENE	Y	UG/L	2.3			0.20	U	U			
1,3-DINITROBENZENE		UG/L	2.2			0.26			0.20	U	U
1,3-DINITROBENZENE	Y	UG/L	2.0	U	U	0.20	U	U			
2,4,6-TRINITROTOLUENE		UG/L	2.0	U	U	0.99			0.20	U	U
2,4,6-TRINITROTOLUENE	Y	UG/L	3.4		J	0.62					
2,4-DINITROTOLUENE		UG/L	2.0	U	U	0.24			0.20	U	U
2,4-DINITROTOLUENE	Y	UG/L	2.2			0.22					
2,6-DINITROTOLUENE		UG/L	11		J	0.87			0.44		
2,6-DINITROTOLUENE	Y	UG/L	11		J	0.69					
2-NITROTOLUENE		UG/L	2.0	U	U	0.20	U	U	0.20	U	U
2-NITROTOLUENE	Y	UG/L	2.0	U	U	0.20	U	U			
3-NITROTOLUENE		UG/L	2.0	U	U	0.20	U	U	0.20	U	U
3-NITROTOLUENE	Y	UG/L	2.0	U	U	0.20	U	U			
4-AMINO-2,6-DINITROTOLUENE		UG/L	8.7		J	1.1			0.20	U	U
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	5.8			0.63					
HMX		UG/L	5.0	U	U	0.50	U	U	0.50	U	U
HMX	Y	UG/L	32	GU	U	0.50	U	U			
NITROBENZENE		UG/L	2.0	U	U	0.91			0.20	U	U
NITROBENZENE	Y	UG/L	2.0	U	U	0.68					
RDX		UG/L	20	GU	U	0.50	U	U	0.50	U	U
RDX	Y	UG/L	5.0	U	U	0.50	U	U			
TETRYL		UG/L	9.0	GU	U	0.20	U	U	0.20	U	U
TETRYL	Y	UG/L	2.0	U	U	0.20	U	U			

Sample No:			5300			5310			5320		
Sample Location:			MK-MW24			IT-MW02			IT-MW05		
Sample Date:			22-OCT-96			30-SEP-96			20-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:EXPLOSIVES-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.20	U	U	9.7			0.20	U	U
1,3,5-TRINITROBENZENE	Y	UG/L	0.20	U	U				0.20	U	U
1,3-DINITROBENZENE		UG/L	0.20	U	U	12			0.20	U	U
1,3-DINITROBENZENE	Y	UG/L	0.20	U	U				0.20	U	U
2,4,6-TRINITROTOLUENE		UG/L	0.20	U	U	2.0	U	U	0.55	GU	U
2,4,6-TRINITROTOLUENE	Y	UG/L	0.20	U	U				0.20	U	U
2,4-DINITROTOLUENE		UG/L	0.20	U	U	20			0.20	U	U
2,4-DINITROTOLUENE	Y	UG/L	0.20	U	U				0.20	U	U
2,6-DINITROTOLUENE		UG/L	0.20	U	U	2.3			0.20	U	U
2,6-DINITROTOLUENE	Y	UG/L	0.20	U	U				0.20	U	U
2-NITROTOLUENE		UG/L	0.20	U	U	2.0	U	U	0.20	U	U
2-NITROTOLUENE	Y	UG/L	0.20	U	U				0.20	U	U
3-NITROTOLUENE		UG/L	0.20	U	U	2.0	U	U	0.20	U	U
3-NITROTOLUENE	Y	UG/L	0.20	U	U				0.20	U	U
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.20	U	U	2.0	U	U	0.20	U	U
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.20	U	U				0.20	U	U
HMX		UG/L	0.50	U	U	14	GU	U	0.50	U	U
HMX	Y	UG/L	0.50	U	U				0.50	U	U
NITROBENZENE		UG/L	0.20	U	U	2.0	U	U	0.20	U	U
NITROBENZENE	Y	UG/L	0.20	U	U				0.20	U	U
RDX		UG/L	0.50	U	U	11			0.50	U	U
RDX	Y	UG/L	0.50	U	U				0.99	GU	U
TETRYL		UG/L	0.20	U	U	18	GU	U	0.20	U	U
TETRYL	Y	UG/L	0.20	U	U				0.20	U	U

Sample No:			5010			5030			5050		
Sample Location:			IT-MW06			IT-MW08			PB-TNTA-MW10		
Sample Date:			18-OCT-96			17-OCT-96			27-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:CYANIDE-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TOTAL CYANIDE		MG/L	0.010	U	U	0.010	U	U	0.010	U	U

Sample No:			5060			5070			5080		
Sample Location:			PB-TNTA-MW11			PB-TNTC-MW3			PB-TNTC-MW4		
Sample Date:			27-SEP-96			27-SEP-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:CYANIDE-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TOTAL CYANIDE		MG/L	0.010	U	U	0.010	U	U	0.010	U	U

Sample No:			5090			5100			5110		
Sample Location:			PB-TNTC-MW5			PB-TNTC-MW6			PB-WA-MW1		
Sample Date:			30-SEP-96			02-OCT-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:CYANIDE-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TOTAL CYANIDE		MG/L	0.010	U	U	0.010	U	U	0.010	U	U

Report Date: 04/07/97

Sample No:			5120			5130			5140		
Sample Location:			PB-WA-MW2			PB-PR-MW7			PB-PR-MW8		
Sample Date:			30-SEP-96			21-OCT-96			20-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:CYANIDE-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TOTAL CYANIDE		MG/L	0.057			0.19			0.43		

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Data Summary - Ground Water

Report Date: 04/07/97

Sample No:			5150			5160			5170		
Sample Location:			PB-PR-MW9			PB-BED-MW13			PB-BED-MW14		
Sample Date:			20-OCT-96			17-OCT-96			17-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:CYANIDE-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TOTAL CYANIDE		MG/L	0.062			0.010	U	U	0.020		

Report Date: 04/07/97

Sample No:			5180			5190			5200		
Sample Location:			PB-BED-MW15			PB-BED-MW16			PB-BED-MW17		
Sample Date:			21-OCT-96			25-OCT-96			24-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:CYANIDE-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TOTAL CYANIDE		MG/L	0.010	U	U	0.10	U	U	0.010	U	U

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Data Summary - Ground Water

Report Date: 04/07/97

Sample No:			5210			5220			5230		
Sample Location:			PB-BED-MW18			PB-BED-MW19			PB-BED-MW20		
Sample Date:			22-OCT-96			17-OCT-96			23-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:CYANIDE-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TOTAL CYANIDE		MG/L	0.010	U	U	0.010	U	U	0.010	U	U

Report Date: 04/07/97

Sample No:			5240			5250			5260		
Sample Location:			MK-MW10			MK-MW11			MK-MW16		
Sample Date:			27-SEP-96			27-SEP-96			30-SEP-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:CYANIDE-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TOTAL CYANIDE		MG/L	0.010	U	U	0.010	U	U	0.010	U	U

Sample No:			5270			5280			5300		
Sample Location:			MK-MW17			MK-MW22			MK-MW24		
Sample Date:			21-OCT-96			22-OCT-96			22-OCT-96		
Depth			0 - 0			0 - 0			0 - 0		
WELLS:CYANIDE-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TOTAL CYANIDE		MG/L	0.010	U	U	0.010	U	U	0.010	U	U

Sample No:			5310			5320		
Sample Location:			IT-MW02			IT-MW05		
Sample Date:			30-SEP-96			20-OCT-96		
Depth			0 - 0			0 - 0		
WELLS:CYANIDE-W	Fltr	Units	Result	Lab Qlfr	Val Qlfr	Result	Lab Qlfr	Val Qlfr
TOTAL CYANIDE		MG/L	0.026			0.010	U	U

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Report Date: 04/11/97

Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5010		5030		5050	
Sample Location:				IT-MW06		IT-MW08		PB-TNTA-MW10	
Sample Date:				18-OCT-96		17-OCT-96		22-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:VOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZENE		UG/L	0.36						
CHLOROFORM		UG/L	0.15						
ETHYLBENZENE		UG/L	130						
TOLUENE		UG/L	75						
XYLENES (TOTAL)		UG/L	1200						

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Report Date: 04/11/97

Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5060		5070		5080	
Sample Location:				PB-TNTA-MW11		PB-TNTC-MW3		PB-TNTC-MW4	
Sample Date:				22-OCT-96		27-SEP-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:VOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZENE		UG/L	0.36						
CHLOROFORM		UG/L	0.15						
ETHYLBENZENE		UG/L	130						
TOLUENE		UG/L	75						
XYLENES (TOTAL)		UG/L	1200						

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Report Date: 04/11/97

Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5090		5100		5110	
Sample Location:				PB-TNTC-MW5		PB-TNTC-MW6		PB-WA-MW1	
Sample Date:				30-SEP-96		02-OCT-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:VOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZENE		UG/L	0.36						
CHLOROFORM		UG/L	0.15						
ETHYLBENZENE		UG/L	130						
TOLUENE		UG/L	75						
XYLENES (TOTAL)		UG/L	1200						

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Report Date: 04/11/97

Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5120		5130		5140	
Sample Location:				PB-WA-MW2		PB-PR-MW7		PB-PR-MW8	
Sample Date:				30-SEP-96		21-OCT-96		20-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:VOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZENE		UG/L	0.36						
CHLOROFORM		UG/L	0.15						
ETHYLBENZENE		UG/L	130						
TOLUENE		UG/L	75						
XYLENES (TOTAL)		UG/L	1200						

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Report Date: 04/11/97

Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5150		5160		5170	
Sample Location:				PB-PR-MW9		PB-BED-MW13		PB-BED-MW14	
Sample Date:				20-OCT-96		17-OCT-96		17-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:VOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZENE		UG/L	0.36			190			
CHLOROFORM		UG/L	0.15						
ETHYLBENZENE		UG/L	130						
TOLUENE		UG/L	75			190			
XYLENES (TOTAL)		UG/L	1200						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5180		5190		5200	
Sample Location:				PB-BED-MW15		PB-BED-MW16		PB-BED-MW17	
Sample Date:				21-OCT-96		25-OCT-96		24-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:VOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZENE		UG/L	0.36	1300		810		18	
CHLOROFORM		UG/L	0.15	8.6	J	7.8	J		
ETHYLBENZENE		UG/L	130	180		180			
TOLUENE		UG/L	75	800		540		140	
XYLENES (TOTAL)		UG/L	1200			1300			

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5210		5220		5230	
Sample Location:				PB-BED-MW18		PB-BED-MW19		PB-BED-MW20	
Sample Date:				22-OCT-96		17-OCT-96		23-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:VOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZENE		UG/L	0.36	7.9		3.7	J		
CHLOROFORM		UG/L	0.15						
ETHYLBENZENE		UG/L	130						
TOLUENE		UG/L	75						
XYLENES (TOTAL)		UG/L	1200						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5240		5250		5260	
Sample Location:				MK-MW10		MK-MW11		MK-MW16	
Sample Date:				27-SEP-96		27-SEP-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:VOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZENE		UG/L	0.36						
CHLOROFORM		UG/L	0.15						
ETHYLBENZENE		UG/L	130						
TOLUENE		UG/L	75						
XYLENES (TOTAL)		UG/L	1200						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5270		5280		5290	
Sample Location:				MK-MW17		MK-MW22		MK-MW23	
Sample Date:				21-OCT-96		22-OCT-96		23-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:VOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZENE		UG/L	0.36						
CHLOROFORM		UG/L	0.15						
ETHYLBENZENE		UG/L	130						
TOLUENE		UG/L	75						
XYLENES (TOTAL)		UG/L	1200						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5300		5310		5320	
Sample Location:				MK-MW24		IT-MW02		IT-MW05	
Sample Date:				22-OCT-96		30-SEP-96		20-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:VOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZENE		UG/L	0.36						
CHLOROFORM		UG/L	0.15						
ETHYLBENZENE		UG/L	130						
TOLUENE		UG/L	75						
XYLENES (TOTAL)		UG/L	1200						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				TCLP001		TCLP002		TCLP003	
Sample Location:				IT-MW08		IT-MW06		IT-MW09	
Sample Date:				25-SEP-96		26-SEP-96		25-SEP-96	
Depth				0-15		0-20		0-15	
WELLS:VOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZENE		UG/L	0.36						
CHLOROFORM		UG/L	0.15						
ETHYLBENZENE		UG/L	130						
TOLUENE		UG/L	75						
XYLENES (TOTAL)		UG/L	1200						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5010		5030		5050	
Sample Location:				IT-MW06		IT-MW08		PB-TNTA-MW10	
Sample Date:				18-OCT-96		17-OCT-96		22-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:SEMIVOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
2,4-DIMETHYLPHENOL		UG/L							
2,4-DINITROPHENOL		UG/L							
2,4-DINITROTOLUENE		UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2-METHYLNAPHTHALENE		UG/L	30						
2-NITROANILINE		UG/L							
3-NITROANILINE		UG/L	11						
4,6-DINITRO-2-METHYLPHENOL		UG/L	0.18						
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	4.8						
NITROBENZENE		UG/L	0.34						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5060		5070		5080	
Sample Location:				PB-TNTA-MW11		PB-TNTC-MW3		PB-TNTC-MW4	
Sample Date:				22-OCT-96		27-SEP-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:SEMIVOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
2,4-DIMETHYLPHENOL		UG/L							
2,4-DINITROPHENOL		UG/L							
2,4-DINITROTOLUENE		UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2-METHYLNAPHTHALENE		UG/L	30						
2-NITROANILINE		UG/L							
3-NITROANILINE		UG/L	11						
4,6-DINITRO-2-METHYLPHENOL		UG/L	0.18						
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	4.8						
NITROBENZENE		UG/L	0.34						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5090		5100		5110	
Sample Location:				PB-TNTC-MW5		PB-TNTC-MW6		PB-WA-MW1	
Sample Date:				30-SEP-96		02-OCT-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:SEMIVOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
2,4-DIMETHYLPHENOL		UG/L							
2,4-DINITROPHENOL		UG/L							
2,4-DINITROTOLUENE		UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2-METHYLNAPHTHALENE		UG/L	30						
2-NITROANILINE		UG/L							
3-NITROANILINE		UG/L	11						
4,6-DINITRO-2-METHYLPHENOL		UG/L	0.18						
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	4.8						
NITROBENZENE		UG/L	0.34						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5120		5130		5140	
Sample Location:				PB-WA-MW2		PB-PR-MW7		PB-PR-MW8	
Sample Date:				30-SEP-96		21-OCT-96		20-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:SEMIVOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
2,4-DIMETHYLPHENOL		UG/L							
2,4-DINITROPHENOL		UG/L						690	J
2,4-DINITROTOLUENE		UG/L	7.3	30				530	
2,6-DINITROTOLUENE		UG/L	3.7			70		52	J
2-METHYLNAPHTHALENE		UG/L	30						
2-NITROANILINE		UG/L							
3-NITROANILINE		UG/L	11	110	J				
4,6-DINITRO-2-METHYLPHENOL		UG/L	0.18					870	J
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	4.8						
NITROBENZENE		UG/L	0.34			6.9	J		

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5150		5160		5170	
Sample Location:				PB-PR-MW9		PB-BED-MW13		PB-BED-MW14	
Sample Date:				20-OCT-96		17-OCT-96		17-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:SEMIVOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
2,4-DIMETHYLPHENOL		UG/L				13	J		
2,4-DINITROPHENOL		UG/L							
2,4-DINITROTOLUENE		UG/L	7.3	30					
2,6-DINITROTOLUENE		UG/L	3.7	6.8	J				
2-METHYLNAPHTHALENE		UG/L	30			34			
2-NITROANILINE		UG/L		2.0	J				
3-NITROANILINE		UG/L	11						
4,6-DINITRO-2-METHYLPHENOL		UG/L	0.18						
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	4.8						
NITROBENZENE		UG/L	0.34						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5180		5190		5200	
Sample Location:				PB-BED-MW15		PB-BED-MW16		PB-BED-MW17	
Sample Date:				21-OCT-96		25-OCT-96		24-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:SEMIVOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
2,4-DIMETHYLPHENOL		UG/L		16	J				
2,4-DINITROPHENOL		UG/L							
2,4-DINITROTOLUENE		UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2-METHYLNAPHTHALENE		UG/L	30	72	J	69	J		
2-NITROANILINE		UG/L							
3-NITROANILINE		UG/L	11						
4,6-DINITRO-2-METHYLPHENOL		UG/L	0.18						
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	4.8	14	J				
NITROBENZENE		UG/L	0.34						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5210		5220		5230	
Sample Location:				PB-BED-MW18		PB-BED-MW19		PB-BED-MW20	
Sample Date:				22-OCT-96		17-OCT-96		23-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:SEMIVOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
2,4-DIMETHYLPHENOL		UG/L		16					
2,4-DINITROPHENOL		UG/L							
2,4-DINITROTOLUENE		UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2-METHYLNAPHTHALENE		UG/L	30						
2-NITROANILINE		UG/L							
3-NITROANILINE		UG/L	11						
4,6-DINITRO-2-METHYLPHENOL		UG/L	0.18						
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	4.8						
NITROBENZENE		UG/L	0.34						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5240		5250		5260	
Sample Location:				MK-MW10		MK-MW11		MK-MW16	
Sample Date:				27-SEP-96		27-SEP-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:SEMIVOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
2,4-DIMETHYLPHENOL		UG/L							
2,4-DINITROPHENOL		UG/L							
2,4-DINITROTOLUENE		UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2-METHYLNAPHTHALENE		UG/L	30						
2-NITROANILINE		UG/L							
3-NITROANILINE		UG/L	11						
4,6-DINITRO-2-METHYLPHENOL		UG/L	0.18						
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	4.8						
NITROBENZENE		UG/L	0.34						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5270		5280		5290	
Sample Location:				MK-MW17		MK-MW22		MK-MW23	
Sample Date:				21-OCT-96		22-OCT-96		23-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:SEMIVOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
2,4-DIMETHYLPHENOL		UG/L							
2,4-DINITROPHENOL		UG/L							
2,4-DINITROTOLUENE		UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2-METHYLNAPHTHALENE		UG/L	30						
2-NITROANILINE		UG/L							
3-NITROANILINE		UG/L	11						
4,6-DINITRO-2-METHYLPHENOL		UG/L	0.18						
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	4.8						
NITROBENZENE		UG/L	0.34						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5300		5310		5320	
Sample Location:				MK-MW24		IT-MW02		IT-MW05	
Sample Date:				22-OCT-96		30-SEP-96		20-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:SEMIVOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
2,4-DIMETHYLPHENOL		UG/L							
2,4-DINITROPHENOL		UG/L							
2,4-DINITROTOLUENE		UG/L	7.3			110	J		
2,6-DINITROTOLUENE		UG/L	3.7			16	J		
2-METHYLNAPHTHALENE		UG/L	30						
2-NITROANILINE		UG/L							
3-NITROANILINE		UG/L	11						
4,6-DINITRO-2-METHYLPHENOL		UG/L	0.18			60	J		
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	4.8						
NITROBENZENE		UG/L	0.34						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				TCLP001		TCLP002		TCLP003	
Sample Location:				IT-MW08		IT-MW06		IT-MW09	
Sample Date:				25-SEP-96		26-SEP-96		25-SEP-96	
Depth				0-15		0-20		0-15	
WELLS:SEMIVOLATILES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
2,4-DIMETHYLPHENOL		UG/L							
2,4-DINITROPHENOL		UG/L							
2,4-DINITROTOLUENE		UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2-METHYLNAPHTHALENE		UG/L	30						
2-NITROANILINE		UG/L							
3-NITROANILINE		UG/L	11						
4,6-DINITRO-2-METHYLPHENOL		UG/L	0.18						
BIS(2-ETHYLHEXYL) PHTHALATE		UG/L	4.8						
NITROBENZENE		UG/L	0.34						

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WELLS:METALS-W	Fltr	Units	Screening Levels	5010 IT-MW06 18-OCT-96 0-0 Result	Val Qlfr	5030 IT-MW08 17-OCT-96 0-0 Result	Val Qlfr	5050 PB-TNTA-MW10 22-OCT-96 0-0 Result	Val Qlfr
ALUMINUM		UG/L	3700	4350	J				
ALUMINUM	Y	UG/L	3700						
ANTIMONY		UG/L	1.5						
ANTIMONY	Y	UG/L	1.5						
ARSENIC		UG/L	.045	14.2				12.2	
ARSENIC	Y	UG/L	.045						
BARIUM		UG/L	260	264					
BARIUM	Y	UG/L	260						
CADMIUM	Y	UG/L	1.8						
CALCIUM		UG/L		124000		373000		250000	
CALCIUM	Y	UG/L		130000		362000		238000	
CHROMIUM		UG/L	18	22.1					
CHROMIUM	Y	UG/L	18						
COBALT		UG/L	220						
COBALT	Y	UG/L	220						
COPPER		UG/L	150						
COPPER	Y	UG/L	150						
IRON		UG/L	1100	16700				26200	
IRON	Y	UG/L	1100					19500	
LEAD		UG/L	15	21.6					
LEAD	Y	UG/L	15						
MAGNESIUM		UG/L		54000	J	142000	J	66400	
MAGNESIUM	Y	UG/L		55800		137000		64900	
MANGANESE		UG/L	73	2960		263		2740	
MANGANESE	Y	UG/L	73	1630		211		2580	
NICKEL		UG/L	73						
NICKEL	Y	UG/L	73						
POTASSIUM		UG/L		12700		15700		6290	
POTASSIUM	Y	UG/L		14800		15300		6520	

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Blank Corrected, Risk-Based Comparison (Ground Water)

				5060 PB-TNTA-MW11 22-OCT-96 0-0		5070 PB-TNTC-MW3 27-SEP-96 0-0		5080 PB-TNTC-MW4 30-SEP-96 0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		UG/L	3700			9540		6590	
ALUMINUM	Y	UG/L	3700						
ANTIMONY		UG/L	1.5						
ANTIMONY	Y	UG/L	1.5						
ARSENIC		UG/L	.045	12.5		51.6		47.8	
ARSENIC	Y	UG/L	.045						
BARIUM		UG/L	260			286			
BARIUM	Y	UG/L	260						
CADMIUM	Y	UG/L	1.8						
CALCIUM		UG/L		157000		527000		290000	
CALCIUM	Y	UG/L		203000		547000		313000	
CHROMIUM		UG/L	18			57.5		46.9	
CHROMIUM	Y	UG/L	18						
COBALT		UG/L	220						
COBALT	Y	UG/L	220						
COPPER		UG/L	150						
COPPER	Y	UG/L	150						
IRON		UG/L	1100	11500		41100		36800	
IRON	Y	UG/L	1100						
LEAD		UG/L	15			47.7		36.4	
LEAD	Y	UG/L	15			36.1		20.9	
MAGNESIUM		UG/L		64100		211000		150000	
MAGNESIUM	Y	UG/L		87300		216000	J	168000	J
MANGANESE		UG/L	73	457		5100		1130	
MANGANESE	Y	UG/L	73	526		5300	J	998	J
NICKEL		UG/L	73			198			
NICKEL	Y	UG/L	73			170			
POTASSIUM		UG/L		19400		25300		28100	
POTASSIUM	Y	UG/L		27000		23700		30600	

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WELLS:METALS-W	Fltr	Units	Screening Levels	5090 PB-TNTC-MW5 30-SEP-96 0-0 Result	Val Qlfr	5100 PB-TNTC-MW6 02-OCT-96 0-0 Result	Val Qlfr	5110 PB-WA-MW1 30-SEP-96 0-0 Result	Val Qlfr
ALUMINUM		UG/L	3700						
ALUMINUM	Y	UG/L	3700						
ANTIMONY		UG/L	1.5						
ANTIMONY	Y	UG/L	1.5						
ARSENIC		UG/L	.045						
ARSENIC	Y	UG/L	.045						
BARIUM		UG/L	260						
BARIUM	Y	UG/L	260						
CADMIUM	Y	UG/L	1.8						
CALCIUM		UG/L		135000		255000		156000	
CALCIUM	Y	UG/L		126000		253000		158000	
CHROMIUM		UG/L	18			50.7			
CHROMIUM	Y	UG/L	18						
COBALT		UG/L	220						
COBALT	Y	UG/L	220						
COPPER		UG/L	150						
COPPER	Y	UG/L	150						
IRON		UG/L	1100	6540		9940		4300	
IRON	Y	UG/L	1100						
LEAD		UG/L	15	23.6					
LEAD	Y	UG/L	15						
MAGNESIUM		UG/L		53100		17800		65200	
MAGNESIUM	Y	UG/L		51700	J	16800		62100	J
MANGANESE		UG/L	73	717		2580		342	
MANGANESE	Y	UG/L	73	503	J	2540		364	J
NICKEL		UG/L	73						
NICKEL	Y	UG/L	73						
POTASSIUM		UG/L		16400		14100			
POTASSIUM	Y	UG/L		15900		14500			

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Blank Corrected, Risk-Based Comparison (Ground Water)

				5120 PB-WA-MW2 30-SEP-96 0-0		5130 PB-PR-MW7 21-OCT-96 0-0		5140 PB-PR-MW8 20-OCT-96 0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		UG/L	3700	13400					
ALUMINUM	Y	UG/L	3700						
ANTIMONY		UG/L	1.5					76.0	
ANTIMONY	Y	UG/L	1.5						
ARSENIC		UG/L	.045	11.0					
ARSENIC	Y	UG/L	.045						
BARIUM		UG/L	260						
BARIUM	Y	UG/L	260						
CADMIUM	Y	UG/L	1.8					7.2	
CALCIUM		UG/L		394000		540000		994000	
CALCIUM	Y	UG/L		244000		562000		967000	
CHROMIUM		UG/L	18	30.7		35.5		149	
CHROMIUM	Y	UG/L	18			33.1		150	
COBALT		UG/L	220			2250		6340	
COBALT	Y	UG/L	220			2240		6480	
COPPER		UG/L	150			964		4680	
COPPER	Y	UG/L	150			931	J	4710	J
IRON		UG/L	1100	26800		6010		13300	
IRON	Y	UG/L	1100			1150		13200	
LEAD		UG/L	15						
LEAD	Y	UG/L	15						
MAGNESIUM		UG/L		143000		180000	J	424000	J
MAGNESIUM	Y	UG/L		89300	J	165000		422000	
MANGANESE		UG/L	73	1540		13600		30700	
MANGANESE	Y	UG/L	73	913	J	15200		30900	
NICKEL		UG/L	73	207		1690		6080	
NICKEL	Y	UG/L	73	123		1630	J	6230	J
POTASSIUM		UG/L		23700		11800		35400	
POTASSIUM	Y	UG/L		13800		8310		35100	

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				5150 PB-PR-MW9 20-OCT-96 0-0		5160 PB-BED-MW13 17-OCT-96 0-0		5170 PB-BED-MW14 17-OCT-96 0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		UG/L	3700						
ALUMINUM	Y	UG/L	3700						
ANTIMONY		UG/L	1.5	78.3					
ANTIMONY	Y	UG/L	1.5						
ARSENIC		UG/L	.045						
ARSENIC	Y	UG/L	.045						
BARIUM		UG/L	260			3700			
BARIUM	Y	UG/L	260			3300			
CADMIUM	Y	UG/L	1.8						
CALCIUM		UG/L		428000		418000		210000	
CALCIUM	Y	UG/L		410000		381000		132000	
CHROMIUM		UG/L	18	27.9					
CHROMIUM	Y	UG/L	18	26.6					
COBALT		UG/L	220	762					
COBALT	Y	UG/L	220	692					
COPPER		UG/L	150	445					
COPPER	Y	UG/L	150	414	J				
IRON		UG/L	1100	1750					
IRON	Y	UG/L	1100	1190					
LEAD		UG/L	15						
LEAD	Y	UG/L	15						
MAGNESIUM		UG/L		178000	J	308000	J	125000	J
MAGNESIUM	Y	UG/L		171000		277000		97700	
MANGANESE		UG/L	73	2280					
MANGANESE	Y	UG/L	73	2140					
NICKEL		UG/L	73	1060					
NICKEL	Y	UG/L	73	963	J				
POTASSIUM		UG/L		17100		79000		38300	
POTASSIUM	Y	UG/L		16700		71100		64500	

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				5180 PB-BED-MW15 21-OCT-96 0-0		5190 PB-BED-MW16 25-OCT-96 0-0		5200 PB-BED-MW17 24-OCT-96 0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		UG/L	3700						
ALUMINUM	Y	UG/L	3700			9440	R		
ANTIMONY		UG/L	1.5	77.6		93.1		61.4	
ANTIMONY	Y	UG/L	1.5	69.6					
ARSENIC		UG/L	.045						
ARSENIC	Y	UG/L	.045					11.1	
BARIUM		UG/L	260	1850		1210		1230	
BARIUM	Y	UG/L	260	2390		631	R	1140	R
CADMIUM	Y	UG/L	1.8						
CALCIUM		UG/L		459000		17700000		268000	
CALCIUM	Y	UG/L		556000		2530000		238000	
CHROMIUM		UG/L	18			33.4			
CHROMIUM	Y	UG/L	18			86.2	R		
COBALT		UG/L	220						
COBALT	Y	UG/L	220						
COPPER		UG/L	150						
COPPER	Y	UG/L	150						
IRON		UG/L	1100						
IRON	Y	UG/L	1100			43700	R		
LEAD		UG/L	15						
LEAD	Y	UG/L	15			44.4			
MAGNESIUM		UG/L		358000		361000		234000	
MAGNESIUM	Y	UG/L		443000		81600		219000	
MANGANESE		UG/L	73			10300			
MANGANESE	Y	UG/L	73			2280	R		
NICKEL		UG/L	73						
NICKEL	Y	UG/L	73						
POTASSIUM		UG/L		78000		82000		51300	
POTASSIUM	Y	UG/L		104000		97700	R	48100	R

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				5210 PB-BED-MW18 22-OCT-96 0-0		5220 PB-BED-MW19 17-OCT-96 0-0		5230 PB-BED-MW20 23-OCT-96 0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		UG/L	3700						
ALUMINUM	Y	UG/L	3700						
ANTIMONY		UG/L	1.5	109				96.3	
ANTIMONY	Y	UG/L	1.5	66.8	R			89.2	R
ARSENIC		UG/L	.045						
ARSENIC	Y	UG/L	.045						
BARIUM		UG/L	260	1290		2130		26400	
BARIUM	Y	UG/L	260	1160	R	1940		24900	R
CADMIUM	Y	UG/L	1.8						
CALCIUM		UG/L		1610000		228000		2400000	
CALCIUM	Y	UG/L		1480000		210000		2270000	
CHROMIUM		UG/L	18						
CHROMIUM	Y	UG/L	18						
COBALT		UG/L	220						
COBALT	Y	UG/L	220						
COPPER		UG/L	150						
COPPER	Y	UG/L	150						
IRON		UG/L	1100					5760	
IRON	Y	UG/L	1100					4160	R
LEAD		UG/L	15						
LEAD	Y	UG/L	15						
MAGNESIUM		UG/L		1050000		117000	J	1070000	
MAGNESIUM	Y	UG/L		969000		107000		1020000	
MANGANESE		UG/L	73	131				173	
MANGANESE	Y	UG/L	73	98.6	R			161	R
NICKEL		UG/L	73						
NICKEL	Y	UG/L	73						
POTASSIUM		UG/L		211000		37400		101000	
POTASSIUM	Y	UG/L		189000	R	32300		95600	R

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Blank Corrected, Risk-Based Comparison (Ground Water)

WELLS:METALS-W	Fltr	Units	Screening Levels	5240 MK-MW10 27-SEP-96 0-0 Result	Val Qlfr	5250 MK-MW11 27-SEP-96 0-0 Result	Val Qlfr	5260 MK-MW16 30-SEP-96 0-0 Result	Val Qlfr
ALUMINUM		UG/L	3700	11100				3760	
ALUMINUM	Y	UG/L	3700						
ANTIMONY		UG/L	1.5						
ANTIMONY	Y	UG/L	1.5						
ARSENIC		UG/L	.045	10.0					
ARSENIC	Y	UG/L	.045						
BARIUM		UG/L	260						
BARIUM	Y	UG/L	260						
CADMIUM	Y	UG/L	1.8						
CALCIUM		UG/L		108000		185000		183000	
CALCIUM	Y	UG/L		82300		159000		197000	
CHROMIUM		UG/L	18	24.7					
CHROMIUM	Y	UG/L	18						
COBALT		UG/L	220						
COBALT	Y	UG/L	220						
COPPER		UG/L	150						
COPPER	Y	UG/L	150						
IRON		UG/L	1100	26500		8020		12100	
IRON	Y	UG/L	1100						
LEAD		UG/L	15	43.9		37.6		34.8	
LEAD	Y	UG/L	15						
MAGNESIUM		UG/L		34100		47100		68400	
MAGNESIUM	Y	UG/L		22300	J	41400	J	71100	J
MANGANESE		UG/L	73	412		978		12000	
MANGANESE	Y	UG/L	73					11600	J
NICKEL		UG/L	73					114	
NICKEL	Y	UG/L	73					148	
POTASSIUM		UG/L							
POTASSIUM	Y	UG/L							

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Blank Corrected, Risk-Based Comparison (Ground Water)

WELLS:METALS-W	Fltr	Units	Screening Levels	5270 MK-MW17 21-OCT-96 0-0 Result	Val Qlfr	5280 MK-MW22 22-OCT-96 0-0 Result	Val Qlfr	5290 MK-MW23 23-OCT-96 0-0 Result	Val Qlfr
ALUMINUM		UG/L	3700						
ALUMINUM	Y	UG/L	3700						
ANTIMONY		UG/L	1.5						
ANTIMONY	Y	UG/L	1.5					61.6	R
ARSENIC		UG/L	.045	10.2					
ARSENIC	Y	UG/L	.045	11.4				10.4	
BARIUM		UG/L	260						
BARIUM	Y	UG/L	260						
CADMIUM	Y	UG/L	1.8						
CALCIUM		UG/L		124000		185000			
CALCIUM	Y	UG/L		145000		129000		135000	
CHROMIUM		UG/L	18						
CHROMIUM	Y	UG/L	18						
COBALT		UG/L	220						
COBALT	Y	UG/L	220						
COPPER		UG/L	150						
COPPER	Y	UG/L	150						
IRON		UG/L	1100	34800		4520			
IRON	Y	UG/L	1100	38300					
LEAD		UG/L	15						
LEAD	Y	UG/L	15						
MAGNESIUM		UG/L		29900		28900			
MAGNESIUM	Y	UG/L		35100		21800		50400	
MANGANESE		UG/L	73	1430		643			
MANGANESE	Y	UG/L	73	1680		269		327	R
NICKEL		UG/L	73	156					
NICKEL	Y	UG/L	73	182					
POTASSIUM		UG/L							
POTASSIUM	Y	UG/L						8680	R

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WELLS:METALS-W	Fltr	Units	Screening Levels	5300 MK-MW24 22-OCT-96 0-0 Result	Val Qlfr	5310 IT-MW02 30-SEP-96 0-0 Result	Val Qlfr	5320 IT-MW05 20-OCT-96 0-0 Result	Val Qlfr
ALUMINUM		UG/L	3700						
ALUMINUM	Y	UG/L	3700						
ANTIMONY		UG/L	1.5						
ANTIMONY	Y	UG/L	1.5						
ARSENIC		UG/L	.045					13.6	
ARSENIC	Y	UG/L	.045						
BARIUM		UG/L	260					277	
BARIUM	Y	UG/L	260						
CADMIUM	Y	UG/L	1.8						
CALCIUM		UG/L		629000		151000		156000	
CALCIUM	Y	UG/L		681000		157000		132000	
CHROMIUM		UG/L	18						
CHROMIUM	Y	UG/L	18						
COBALT		UG/L	220						
COBALT	Y	UG/L	220						
COPPER		UG/L	150						
COPPER	Y	UG/L	150						
IRON		UG/L	1100	4720		1120		7840	
IRON	Y	UG/L	1100	1400	R				
LEAD		UG/L	15			27.7			
LEAD	Y	UG/L	15			28.4			
MAGNESIUM		UG/L		31300		65400		48500	J
MAGNESIUM	Y	UG/L		35000		67500	J	45600	
MANGANESE		UG/L	73	348		1230		459	
MANGANESE	Y	UG/L	73	377	R	1190	J	195	
NICKEL		UG/L	73						
NICKEL	Y	UG/L	73						
POTASSIUM		UG/L							
POTASSIUM	Y	UG/L							

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WELLS:METALS-W	Fltr	Units	Screening Levels	TCLP001 IT-MW08 25-SEP-96 0-15 Result	Val Qlfr	TCLP002 IT-MW06 26-SEP-96 0-20 Result	Val Qlfr	TCLP003 IT-MW09 25-SEP-96 0-15 Result	Val Qlfr
ALUMINUM		UG/L	3700						
ALUMINUM	Y	UG/L	3700						
ANTIMONY		UG/L	1.5						
ANTIMONY	Y	UG/L	1.5						
ARSENIC		UG/L	.045						
ARSENIC	Y	UG/L	.045						
BARIUM		UG/L	260						
BARIUM	Y	UG/L	260						
CADMIUM	Y	UG/L	1.8						
CALCIUM		UG/L							
CALCIUM	Y	UG/L							
CHROMIUM		UG/L	18						
CHROMIUM	Y	UG/L	18						
COBALT		UG/L	220						
COBALT	Y	UG/L	220						
COPPER		UG/L	150						
COPPER	Y	UG/L	150						
IRON		UG/L	1100						
IRON	Y	UG/L	1100						
LEAD		UG/L	15						
LEAD	Y	UG/L	15						
MAGNESIUM		UG/L							
MAGNESIUM	Y	UG/L							
MANGANESE		UG/L	73						
MANGANESE	Y	UG/L	73						
NICKEL		UG/L	73						
NICKEL	Y	UG/L	73						
POTASSIUM		UG/L							
POTASSIUM	Y	UG/L							

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Sample No:				5010		5030		5050	
Sample Location:				IT-MW06		IT-MW08		PB-TNTA-MW10	
Sample Date:				18-OCT-96		17-OCT-96		22-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SODIUM		UG/L		24700		19800	J	41600	
SODIUM	Y	UG/L		32800	J	19000	J	41900	
VANADIUM		UG/L	26			57.4			
VANADIUM	Y	UG/L	26			62.5			

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Sample No:				5060		5070		5080	
Sample Location:				PB-TNTA-MW11		PB-TNTC-MW3		PB-TNTC-MW4	
Sample Date:				22-OCT-96		27-SEP-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SODIUM		UG/L		101000		77000	J	79200	J
SODIUM	Y	UG/L		142000		78900		92300	
VANADIUM		UG/L	26			87.7		70.1	
VANADIUM	Y	UG/L	26			68.6		52.5	

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Sample No:				5090		5100		5110	
Sample Location:				PB-TNTC-MW5		PB-TNTC-MW6		PB-WA-MW1	
Sample Date:				30-SEP-96		02-OCT-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SODIUM		UG/L		178000	J	17200		15200	J
SODIUM	Y	UG/L		178000		17300		14300	
VANADIUM		UG/L	26						
VANADIUM	Y	UG/L	26						

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Sample No:				5120		5130		5140	
Sample Location:				PB-WA-MW2		PB-PR-MW7		PB-PR-MW8	
Sample Date:				30-SEP-96		21-OCT-96		20-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SODIUM		UG/L		731000	J	3200000		11200000	
SODIUM	Y	UG/L		528000		3380000		11500000	
VANADIUM		UG/L	26	70.5		62.8		65.2	
VANADIUM	Y	UG/L	26			68.3		67.3	

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Sample No:				5150		5160		5170	
Sample Location:				PB-PR-MW9		PB-BED-MW13		PB-BED-MW14	
Sample Date:				20-OCT-96		17-OCT-96		17-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SODIUM		UG/L		1960000		1080000	J	471000	J
SODIUM	Y	UG/L		1710000		1010000	J	346000	J
VANADIUM		UG/L	26	58.9		52.4			
VANADIUM	Y	UG/L	26	56.6		55.3			

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Sample No:				5180		5190		5200	
Sample Location:				PB-BED-MW15		PB-BED-MW16		PB-BED-MW17	
Sample Date:				21-OCT-96		25-OCT-96		24-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SODIUM		UG/L		945000	R	264000		405000	
SODIUM	Y	UG/L		1320000	R	249000	R	376000	R
VANADIUM		UG/L	26			362			
VANADIUM	Y	UG/L	26			140			

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Sample No:				5210		5220		5230	
Sample Location:				PB-BED-MW18		PB-BED-MW19		PB-BED-MW20	
Sample Date:				22-OCT-96		17-OCT-96		23-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SODIUM		UG/L		4490000	R	162000	J	9070000	R
SODIUM	Y	UG/L		4140000	R	147000	J	8680000	R
VANADIUM		UG/L	26					59.4	
VANADIUM	Y	UG/L	26					61.8	

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Sample No:				5240		5250		5260	
Sample Location:				MK-MW10		MK-MW11		MK-MW16	
Sample Date:				27-SEP-96		27-SEP-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SODIUM		UG/L				10600	J	9010	J
SODIUM	Y	UG/L				11300		10600	
VANADIUM		UG/L	26						
VANADIUM	Y	UG/L	26						

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Sample No:				5270		5280		5290	
Sample Location:				MK-MW17		MK-MW22		MK-MW23	
Sample Date:				21-OCT-96		22-OCT-96		23-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SODIUM		UG/L		5980		10900			
SODIUM	Y	UG/L		7140		13100		71700	R
VANADIUM		UG/L	26						
VANADIUM	Y	UG/L	26						

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Sample No:				5300		5310		5320	
Sample Location:				MK-MW24		IT-MW02		IT-MW05	
Sample Date:				22-OCT-96		30-SEP-96		20-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SODIUM		UG/L		5930		286000	J	23600	
SODIUM	Y	UG/L		6520	R	291000		23600	
VANADIUM		UG/L	26	68.2					
VANADIUM	Y	UG/L	26	67.6					

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				TCLP001		TCLP002		TCLP003	
Sample Location:				IT-MW08		IT-MW06		IT-MW09	
Sample Date:				25-SEP-96		26-SEP-96		25-SEP-96	
Depth				0-15		0-20		0-15	
WELLS:METALS-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SODIUM		UG/L							
SODIUM	Y	UG/L							
VANADIUM		UG/L	26						
VANADIUM	Y	UG/L	26						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5010		5030		5050	
Sample Location:				IT-MW06		IT-MW08		PB-TNTA-MW10	
Sample Date:				18-OCT-96		17-OCT-96		22-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:EXPLOSIVES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.18						
1,3,5-TRINITROBENZENE	Y	UG/L	0.18						
1,3-DINITROBENZENE		UG/L	.37						
1,3-DINITROBENZENE	Y	UG/L	.37						
2,4,6-TRINITROTOLUENE		UG/L	2.2						
2,4,6-TRINITROTOLUENE	Y	UG/L	2.2						
2,4-DINITROTOLUENE		UG/L	7.3						
2,4-DINITROTOLUENE	Y	UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2,6-DINITROTOLUENE	Y	UG/L	3.7						
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.22						
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.22						
NITROBENZENE		UG/L	0.34						
NITROBENZENE	Y	UG/L	0.34						
RDX		UG/L	0.61						
RDX	Y	UG/L	0.61						

PLU BROOK

Wells

Report Date: 04/08/97

Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5060		5070		5080	
Sample Location:				PB-TNTA-MW11		PB-TNTC-MW3		PB-TNTC-MW4	
Sample Date:				22-OCT-96		27-SEP-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:EXPLOSIVES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.18						
1,3,5-TRINITROBENZENE	Y	UG/L	0.18						
1,3-DINITROBENZENE		UG/L	.37						
1,3-DINITROBENZENE	Y	UG/L	.37						
2,4,6-TRINITROTOLUENE		UG/L	2.2						
2,4,6-TRINITROTOLUENE	Y	UG/L	2.2						
2,4-DINITROTOLUENE		UG/L	7.3						
2,4-DINITROTOLUENE	Y	UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2,6-DINITROTOLUENE	Y	UG/L	3.7						
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.22						
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.22						
NITROBENZENE		UG/L	0.34						
NITROBENZENE	Y	UG/L	0.34						
RDX		UG/L	0.61						
RDX	Y	UG/L	0.61						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5090		5100		5110	
Sample Location:				PB-TNTC-MW5		PB-TNTC-MW6		PB-WA-MW1	
Sample Date:				30-SEP-96		02-OCT-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:EXPLOSIVES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.18						
1,3,5-TRINITROBENZENE	Y	UG/L	0.18						
1,3-DINITROBENZENE		UG/L	.37						
1,3-DINITROBENZENE	Y	UG/L	.37						
2,4,6-TRINITROTOLUENE		UG/L	2.2						
2,4,6-TRINITROTOLUENE	Y	UG/L	2.2						
2,4-DINITROTOLUENE		UG/L	7.3						
2,4-DINITROTOLUENE	Y	UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2,6-DINITROTOLUENE	Y	UG/L	3.7						
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.22						
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.22						
NITROBENZENE		UG/L	0.34						
NITROBENZENE	Y	UG/L	0.34						
RDX		UG/L	0.61						
RDX	Y	UG/L	0.61						

Report Date: 04/08/97

Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5120		5130		5140	
Sample Location:				PB-WA-MW2		PB-PR-MW7		PB-PR-MW8	
Sample Date:				30-SEP-96		21-OCT-96		20-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:EXPLOSIVES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.18	11		2000		1700	
1,3,5-TRINITROBENZENE	Y	UG/L	0.18			2400		2100	J
1,3-DINITROBENZENE		UG/L	.37	18		1400		1400	
1,3-DINITROBENZENE	Y	UG/L	.37			1600		1700	J
2,4,6-TRINITROTOLUENE		UG/L	2.2	2.4					
2,4,6-TRINITROTOLUENE	Y	UG/L	2.2					160	J
2,4-DINITROTOLUENE		UG/L	7.3	12		1100		1400	
2,4-DINITROTOLUENE	Y	UG/L	7.3			1400		1400	J
2,6-DINITROTOLUENE		UG/L	3.7			310			
2,6-DINITROTOLUENE	Y	UG/L	3.7			300			
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.22	1.1					
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.22						
NITROBENZENE		UG/L	0.34						
NITROBENZENE	Y	UG/L	0.34						
RDX		UG/L	0.61						
RDX	Y	UG/L	0.61			310		630	J

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5150		5160		5170	
Sample Location:				PB-PR-MW9		PB-BED-MW13		PB-BED-MW14	
Sample Date:				20-OCT-96		17-OCT-96		17-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:EXPLOSIVES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.18	27					
1,3,5-TRINITROBENZENE	Y	UG/L	0.18						
1,3-DINITROBENZENE		UG/L	.37	57					
1,3-DINITROBENZENE	Y	UG/L	.37						
2,4,6-TRINITROTOLUENE		UG/L	2.2						
2,4,6-TRINITROTOLUENE	Y	UG/L	2.2						
2,4-DINITROTOLUENE		UG/L	7.3	36					
2,4-DINITROTOLUENE	Y	UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2,6-DINITROTOLUENE	Y	UG/L	3.7						
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.22			4.4			
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.22			3.9			
NITROBENZENE		UG/L	0.34			0.50			
NITROBENZENE	Y	UG/L	0.34						
RDX		UG/L	0.61						
RDX	Y	UG/L	0.61						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5180		5190		5200	
Sample Location:				PB-BED-MW15		PB-BED-MW16		PB-BED-MW17	
Sample Date:				21-OCT-96		25-OCT-96		24-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:EXPLOSIVES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.18	0.52					
1,3,5-TRINITROBENZENE	Y	UG/L	0.18	0.80					
1,3-DINITROBENZENE		UG/L	.37	0.44					
1,3-DINITROBENZENE	Y	UG/L	.37	0.66					
2,4,6-TRINITROTOLUENE		UG/L	2.2						
2,4,6-TRINITROTOLUENE	Y	UG/L	2.2						
2,4-DINITROTOLUENE		UG/L	7.3						
2,4-DINITROTOLUENE	Y	UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2,6-DINITROTOLUENE	Y	UG/L	3.7						
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.22						
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.22						
NITROBENZENE		UG/L	0.34					0.50	
NITROBENZENE	Y	UG/L	0.34					0.51	
RDX		UG/L	0.61	3.7					
RDX	Y	UG/L	0.61	6.3					

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5210		5220		5230	
Sample Location:				PB-BED-MW18		PB-BED-MW19		PB-BED-MW20	
Sample Date:				22-OCT-96		17-OCT-96		23-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:EXPLOSIVES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.18						
1,3,5-TRINITROBENZENE	Y	UG/L	0.18						
1,3-DINITROBENZENE		UG/L	.37						
1,3-DINITROBENZENE	Y	UG/L	.37						
2,4,6-TRINITROTOLUENE		UG/L	2.2						
2,4,6-TRINITROTOLUENE	Y	UG/L	2.2						
2,4-DINITROTOLUENE		UG/L	7.3						
2,4-DINITROTOLUENE	Y	UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2,6-DINITROTOLUENE	Y	UG/L	3.7						
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.22	4.0					
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.22	21					
NITROBENZENE		UG/L	0.34			0.50			
NITROBENZENE	Y	UG/L	0.34			0.40			
RDX		UG/L	0.61						
RDX	Y	UG/L	0.61						

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Report Date: 04/08/97

Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5240		5250		5260	
Sample Location:				MK-MW10		MK-MW11		MK-MW16	
Sample Date:				27-SEP-96		27-SEP-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:EXPLOSIVES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.18						
1,3,5-TRINITROBENZENE	Y	UG/L	0.18						
1,3-DINITROBENZENE		UG/L	.37						
1,3-DINITROBENZENE	Y	UG/L	.37						
2,4,6-TRINITROTOLUENE		UG/L	2.2						
2,4,6-TRINITROTOLUENE	Y	UG/L	2.2						
2,4-DINITROTOLUENE		UG/L	7.3						
2,4-DINITROTOLUENE	Y	UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2,6-DINITROTOLUENE	Y	UG/L	3.7						
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.22						
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.22						
NITROBENZENE		UG/L	0.34						
NITROBENZENE	Y	UG/L	0.34						
RDX		UG/L	0.61						
RDX	Y	UG/L	0.61						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5270		5280		5290	
Sample Location:				MK-MW17		MK-MW22		MK-MW23	
Sample Date:				21-OCT-96		22-OCT-96		23-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:EXPLOSIVES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.18			0.34	J		
1,3,5-TRINITROBENZENE	Y	UG/L	0.18	2.3					
1,3-DINITROBENZENE		UG/L	.37	2.2					
1,3-DINITROBENZENE	Y	UG/L	.37						
2,4,6-TRINITROTOLUENE		UG/L	2.2						
2,4,6-TRINITROTOLUENE	Y	UG/L	2.2	3.4	J				
2,4-DINITROTOLUENE		UG/L	7.3						
2,4-DINITROTOLUENE	Y	UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7	11	J				
2,6-DINITROTOLUENE	Y	UG/L	3.7	11	J				
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.22	8.7	J	1.1			
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.22	5.8		0.63			
NITROBENZENE		UG/L	0.34			0.91			
NITROBENZENE	Y	UG/L	0.34			0.68			
RDX		UG/L	0.61						
RDX	Y	UG/L	0.61						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5300		5310		5320	
Sample Location:				MK-MW24		IT-MW02		IT-MW05	
Sample Date:				22-OCT-96		30-SEP-96		20-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:EXPLOSIVES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.18			9.7			
1,3,5-TRINITROBENZENE	Y	UG/L	0.18						
1,3-DINITROBENZENE		UG/L	.37			12			
1,3-DINITROBENZENE	Y	UG/L	.37						
2,4,6-TRINITROTOLUENE		UG/L	2.2						
2,4,6-TRINITROTOLUENE	Y	UG/L	2.2						
2,4-DINITROTOLUENE		UG/L	7.3			20			
2,4-DINITROTOLUENE	Y	UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2,6-DINITROTOLUENE	Y	UG/L	3.7						
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.22						
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.22						
NITROBENZENE		UG/L	0.34						
NITROBENZENE	Y	UG/L	0.34						
RDX		UG/L	0.61			11			
RDX	Y	UG/L	0.61						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				TCLP001		TCLP002		TCLP003	
Sample Location:				IT-MW08		IT-MW06		IT-MW09	
Sample Date:				25-SEP-96		26-SEP-96		25-SEP-96	
Depth				0-15		0-20		0-15	
WELLS:EXPLOSIVES-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE		UG/L	0.18						
1,3,5-TRINITROBENZENE	Y	UG/L	0.18						
1,3-DINITROBENZENE		UG/L	.37						
1,3-DINITROBENZENE	Y	UG/L	.37						
2,4,6-TRINITROTOLUENE		UG/L	2.2						
2,4,6-TRINITROTOLUENE	Y	UG/L	2.2						
2,4-DINITROTOLUENE		UG/L	7.3						
2,4-DINITROTOLUENE	Y	UG/L	7.3						
2,6-DINITROTOLUENE		UG/L	3.7						
2,6-DINITROTOLUENE	Y	UG/L	3.7						
4-AMINO-2,6-DINITROTOLUENE		UG/L	0.22						
4-AMINO-2,6-DINITROTOLUENE	Y	UG/L	0.22						
NITROBENZENE		UG/L	0.34						
NITROBENZENE	Y	UG/L	0.34						
RDX		UG/L	0.61						
RDX	Y	UG/L	0.61						

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5010		5030		5050	
Sample Location:				IT-MW06		IT-MW08		PB-TNTA-MW10	
Sample Date:				18-OCT-96		17-OCT-96		22-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:CYANIDE-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
TOTAL CYANIDE		UG/L							

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5060		5070		5080	
Sample Location:				PB-TNTA-MW11		PB-TNTC-MW3		PB-TNTC-MW4	
Sample Date:				22-OCT-96		27-SEP-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:CYANIDE-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
TOTAL CYANIDE		UG/L							

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5090		5100		5110	
Sample Location:				PB-TNTC-MW5		PB-TNTC-MW6		PB-WA-MW1	
Sample Date:				30-SEP-96		02-OCT-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:CYANIDE-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
TOTAL CYANIDE		UG/L							

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5120		5130		5140	
Sample Location:				PB-WA-MW2		PB-PR-MW7		PB-PR-MW8	
Sample Date:				30-SEP-96		21-OCT-96		20-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:CYANIDE-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
TOTAL CYANIDE		UG/L		57		190		430	

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5150		5160		5170	
Sample Location:				PB-PR-MW9		PB-BED-MW13		PB-BED-MW14	
Sample Date:				20-OCT-96		17-OCT-96		17-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:CYANIDE-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
TOTAL CYANIDE		UG/L		62				20	

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5180		5190		5200	
Sample Location:				PB-BED-MW15		PB-BED-MW16		PB-BED-MW17	
Sample Date:				21-OCT-96		25-OCT-96		24-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:CYANIDE-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
TOTAL CYANIDE		UG/L							

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Report Date: 04/08/97

Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5210		5220		5230	
Sample Location:				PB-BED-MW18		PB-BED-MW19		PB-BED-MW20	
Sample Date:				22-OCT-96		17-OCT-96		23-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:CYANIDE-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
TOTAL CYANIDE		UG/L							

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5240		5250		5260	
Sample Location:				MK-MW10		MK-MW11		MK-MW16	
Sample Date:				27-SEP-96		27-SEP-96		30-SEP-96	
Depth				0-0		0-0		0-0	
WELLS:CYANIDE-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
TOTAL CYANIDE		UG/L							

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5270		5280		5290	
Sample Location:				MK-MW17		MK-MW22		MK-MW23	
Sample Date:				21-OCT-96		22-OCT-96		23-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:CYANIDE-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
TOTAL CYANIDE		UG/L							

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Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				5300		5310		5320	
Sample Location:				MK-MW24		IT-MW02		IT-MW05	
Sample Date:				22-OCT-96		30-SEP-96		20-OCT-96	
Depth				0-0		0-0		0-0	
WELLS:CYANIDE-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
TOTAL CYANIDE		UG/L				26			

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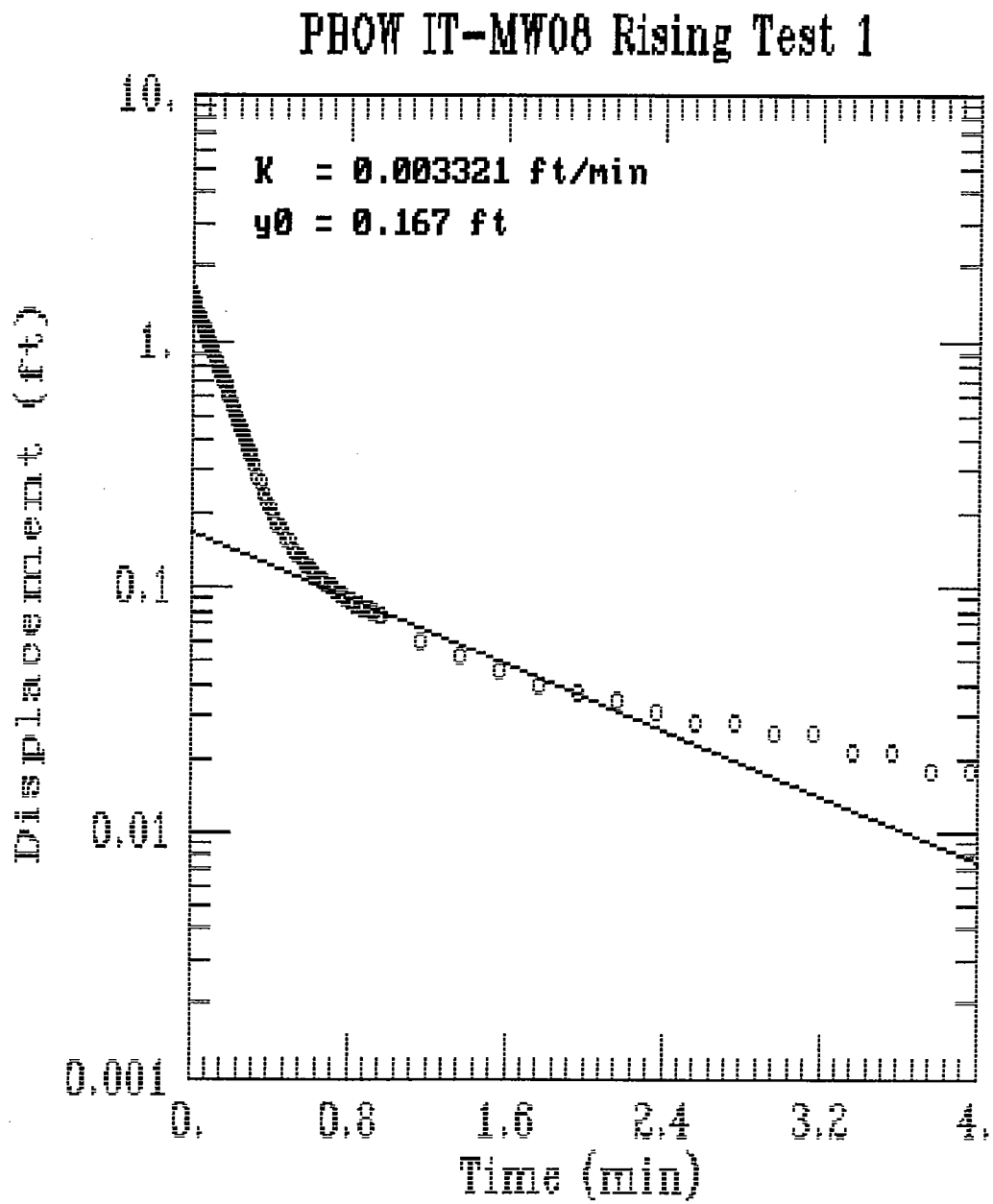
Report Date: 04/08/97

Blank Corrected, Risk-Based Comparison (Ground Water)

Sample No:				TCLP001		TCLP002		TCLP003	
Sample Location:				IT-MW08		IT-MW06		IT-MW09	
Sample Date:				25-SEP-96		26-SEP-96		25-SEP-96	
Depth				0-15		0-20		0-15	
WELLS:CYANIDE-W	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
TOTAL CYANIDE		UG/L							

APPENDIX G

HYDRAULIC CONDUCTIVITY TEST


PBOW IT-MW08 Rising Test 1
K = 0.003321 ft/min
y0 = 0.167 ft
10.
1.
0.1
0.01
0.001
Displacement (ft)
0.
0.8
1.6
2.4
3.2
4.
Time (min)

IT-MW08 Slug Test 1
PBOW, Groundwater Investigation

Elapsed Time	Input 1
0	1.547
0.0033	1.472
0.0066	1.456
0.01	1.406
0.0133	1.413
0.0166	1.366
0.02	1.366
0.0233	1.341
0.0266	1.315
0.03	1.294
0.0333	1.268
0.0366	1.24
0.04	1.237
0.0433	1.212
0.0466	1.221
0.05	1.171
0.0533	1.162
0.0566	1.153
0.06	1.124
0.0633	1.112
0.0666	1.077
0.07	1.052
0.0733	1.055
0.0766	1.037
0.08	1.024
0.0833	1.008
0.0866	0.993
0.09	0.977
0.0933	0.961
0.0966	0.949
0.1	0.921
0.1033	0.918
0.1066	0.877
0.11	0.889
0.1133	0.867
0.1166	0.855
0.12	0.842
0.1233	0.833
0.1266	0.82
0.13	0.808
0.1333	0.792
0.1366	0.78
0.14	0.767
0.1433	0.755
0.1466	0.742
0.15	0.733
0.1533	0.72
0.1566	0.708
0.16	0.698

IT-MW08 Slug Test 1
PBOW, Groundwater Investigation

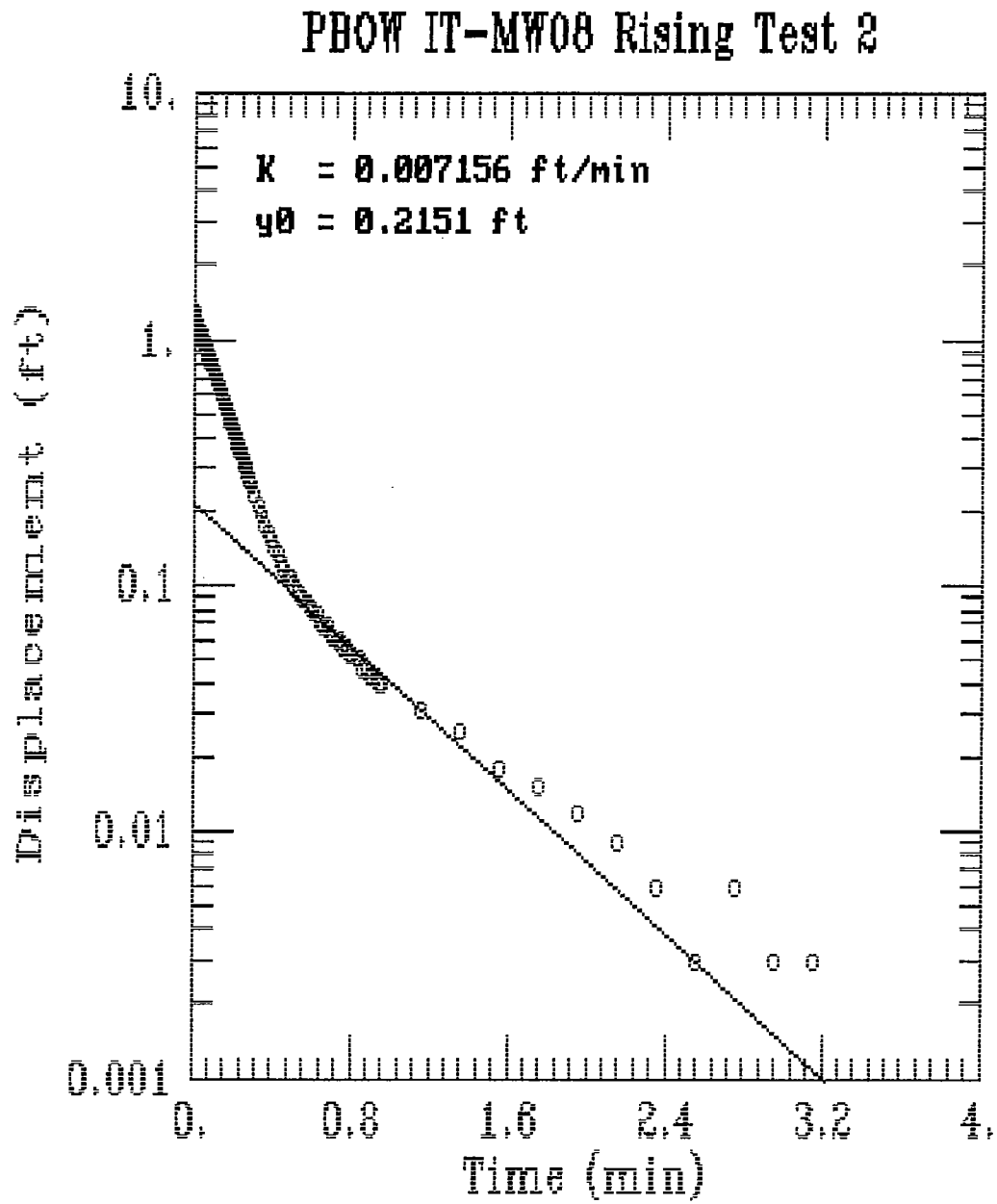
Elapsed Time	Input 1
0.1633	0.686
0.1666	0.683
0.17	0.676
0.1733	0.667
0.1766	0.664
0.18	0.632
0.1833	0.62
0.1866	0.61
0.19	0.601
0.1933	0.592
0.1966	0.582
0.2	0.573
0.2033	0.564
0.2066	0.554
0.21	0.545
0.2133	0.535
0.2166	0.526
0.22	0.517
0.2233	0.51
0.2266	0.482
0.23	0.491
0.2333	0.482
0.2366	0.476
0.24	0.466
0.2433	0.46
0.2466	0.451
0.25	0.444
0.2533	0.438
0.2566	0.429
0.26	0.423
0.2633	0.416
0.2666	0.407
0.27	0.401
0.2733	0.394
0.2766	0.388
0.28	0.382
0.2833	0.375
0.2866	0.369
0.29	0.363
0.2933	0.357
0.2966	0.35
0.3	0.344
0.3033	0.338
0.32	0.31
0.3366	0.285
0.3533	0.263
0.37	0.241
0.3866	0.225
0.4033	0.209

IT-MW08 Slug Test 1
PBOW, Groundwater Investigation

Elapsed Time	Input 1
0.42	0.197
0.4366	0.184
0.4533	0.175
0.47	0.166
0.4866	0.156
0.5033	0.15
0.52	0.144
0.5366	0.137
0.5533	0.134
0.57	0.128
0.5866	0.122
0.6033	0.119
0.62	0.115
0.6366	0.112
0.6533	0.109
0.67	0.106
0.6866	0.103
0.7033	0.1
0.72	0.1
0.7366	0.097
0.7533	0.094
0.77	0.094
0.7866	0.09
0.8033	0.087
0.82	0.087
0.8366	0.084
0.8533	0.084
0.87	0.081
0.8866	0.081
0.9033	0.081
0.92	0.078
0.9366	0.078
0.9533	0.075
0.97	0.075
1.17	0.059
1.37	0.053
1.57	0.046
1.77	0.04
1.97	0.037
2.17	0.034
2.37	0.031
2.57	0.028
2.77	0.028
2.97	0.025
3.17	0.025
3.37	0.021
3.57	0.021
3.77	0.018
3.97	0.018

IT-MW08 Slug Test 1
PBOW, Groundwater Investigation

Elapsed Time	Input 1
4.17	0.015
4.37	0.018
4.57	0.015
4.77	0.015
4.97	0.015
5.17	0.012
5.37	0.012
5.57	0.012
5.77	0.012
5.97	0.012
6.17	0.009
6.37	0.012
6.57	0.009
6.77	0.009
6.97	0.009
7.17	0.009
7.37	0.009
7.57	0.009
7.77	0.009
7.97	0.006
8.17	0.006
8.37	0.006
8.57	0.006
8.77	0.006
8.97	0.006
9.17	0.006
9.37	0.006
9.57	0.006
9.77	0.006
9.97	0.003


PBOW IT-MW08 Rising Test 2
K = 0.007156 ft/min
y0 = 0.2151 ft
10.
1.
0.1
0.01
0.001
Displacement (ft)
0.
0.8
1.6
2.4
3.2
4.
Time (min)

IT-MW08 Slug Test 2
PBOW, Groundwater Investigation

Elapsed Time	Input 1
0	1.3
0.0033	1.272
0.0066	1.225
0.01	1.209
0.0133	1.178
0.0166	1.159
0.02	1.14
0.0233	1.124
0.0266	1.068
0.03	1.096
0.0333	1.068
0.0366	1.049
0.04	1.046
0.0433	1.012
0.0466	0.98
0.05	0.958
0.0533	0.98
0.0566	0.933
0.06	0.933
0.0633	0.918
0.0666	0.892
0.07	0.877
0.0733	0.858
0.0766	0.811
0.08	0.833
0.0833	0.82
0.0866	0.808
0.09	0.792
0.0933	0.78
0.0966	0.764
0.1	0.752
0.1033	0.739
0.1066	0.73
0.11	0.714
0.1133	0.701
0.1166	0.692
0.12	0.676
0.1233	0.664
0.1266	0.651
0.13	0.642
0.1333	0.629
0.1366	0.617
0.14	0.607
0.1433	0.595
0.1466	0.585
0.15	0.573
0.1533	0.564
0.1566	0.554
0.16	0.542

IT-MW08 Slug Test 2
PBOW, Groundwater Investigation

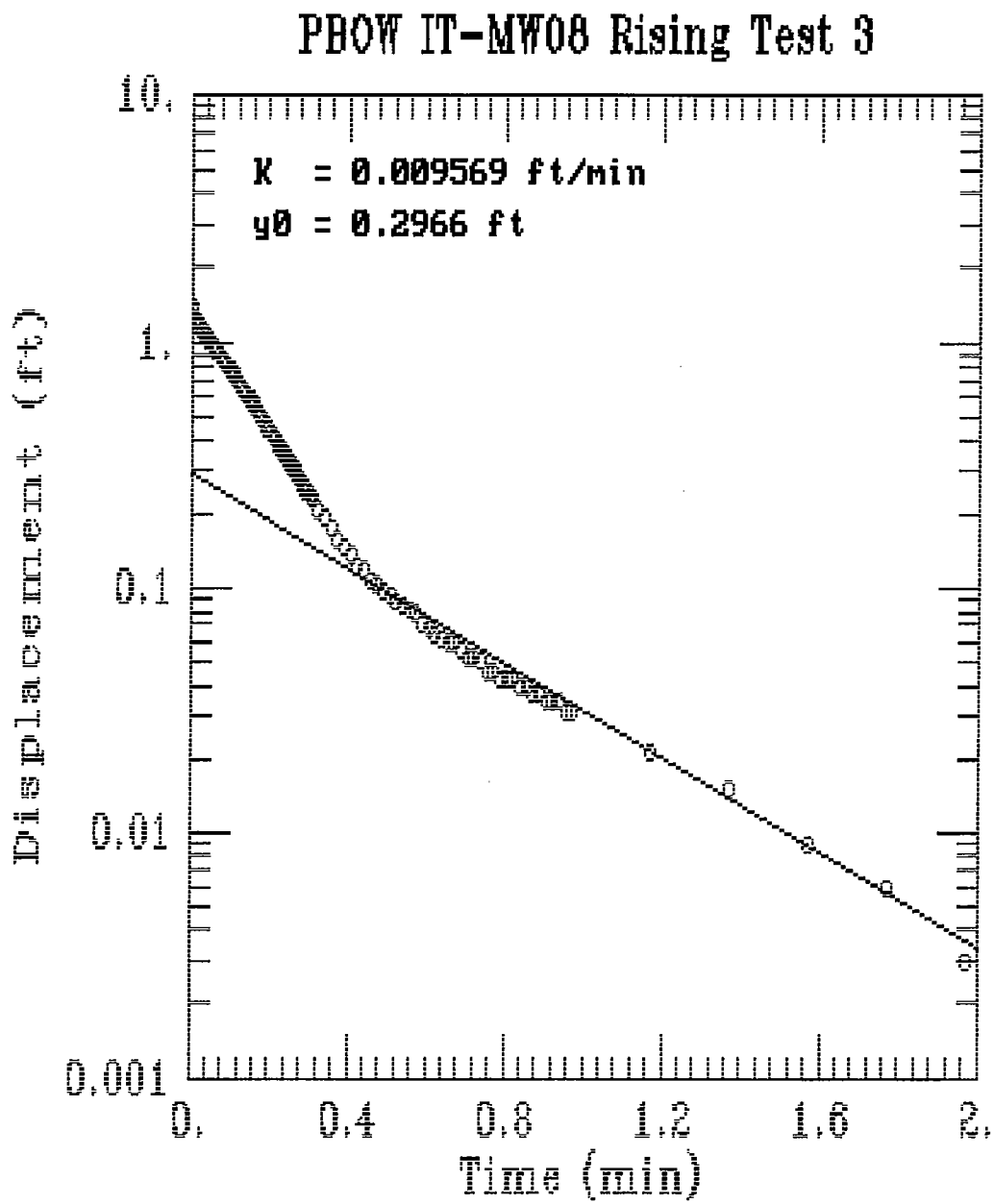
Elapsed Time	Input 1
0.1633	0.532
0.1666	0.523
0.17	0.513
0.1733	0.504
0.1766	0.495
0.18	0.485
0.1833	0.476
0.1866	0.466
0.19	0.457
0.1933	0.448
0.1966	0.441
0.2	0.432
0.2033	0.426
0.2066	0.416
0.21	0.41
0.2133	0.401
0.2166	0.394
0.22	0.385
0.2233	0.379
0.2266	0.372
0.23	0.363
0.2333	0.357
0.2366	0.35
0.24	0.344
0.2433	0.335
0.2466	0.332
0.25	0.322
0.2533	0.316
0.2566	0.31
0.26	0.307
0.2633	0.3
0.2666	0.294
0.27	0.288
0.2733	0.285
0.2766	0.278
0.28	0.272
0.2833	0.269
0.2866	0.263
0.29	0.256
0.2933	0.253
0.31	0.231
0.3266	0.209
0.3433	0.191
0.36	0.175
0.3766	0.162
0.3933	0.15
0.41	0.14
0.4266	0.131
0.4433	0.125
0.46	0.115

IT-MW08 Slug Test 2
PBOW, Groundwater Investigation

Elapsed Time	Input 1
0.4766	0.109
0.4933	0.106
0.51	0.1
0.5266	0.094
0.5433	0.09
0.56	0.087
0.5766	0.084
0.5933	0.081
0.61	0.078
0.6266	0.075
0.6433	0.072
0.66	0.068
0.6766	0.068
0.6933	0.065
0.71	0.062
0.7266	0.059
0.7433	0.059
0.76	0.056
0.7766	0.056
0.7933	0.053
0.81	0.053
0.8266	0.05
0.8433	0.05
0.86	0.046
0.8766	0.046
0.8933	0.043
0.91	0.043
0.9266	0.043
0.9433	0.04
0.96	0.04
1.16	0.031
1.36	0.025
1.56	0.018
1.76	0.015
1.96	0.012
2.16	0.009
2.36	0.006
2.56	0.003
2.76	0.006
2.96	0.003
3.16	0.003
3.36	0
3.56	0
3.76	0
3.96	-0.003
4.16	-0.003
4.36	-0.003
4.56	-0.003
4.76	-0.003
4.96	-0.003

IT-MW08 Slug Test 2
PBOW, Groundwater Investigation

Elapsed Time	Input 1
5.16	-0.006
5.36	-0.006
5.56	-0.006
5.76	-0.006
5.96	-0.006
6.16	-0.006
6.36	-0.009
6.56	-0.009
6.76	-0.009
6.96	-0.009
7.16	-0.009
7.36	-0.009
7.56	-0.009
7.76	-0.009
7.96	-0.009
8.16	-0.012
8.36	-0.012
8.56	-0.009
8.76	-0.012
8.96	-0.012
9.16	-0.012
9.36	-0.012
9.56	-0.012
9.76	-0.012
9.96	-0.012


PBOW IT-MW08 Rising Test 3
K = 0.009569 ft/min
y0 = 0.2966 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
0.4
0.8
1.2
1.6
2.
Time (min)

IT-MW08 Slug Test 3
PBOW, Groundwater Investigation

Elapsed Time	Input 1
0	1.375
0.0034	1.353
0.0067	1.237
0.01	1.228
0.0134	1.2
0.0167	1.178
0.02	1.153
0.0234	1.165
0.0267	1.102
0.03	1.102
0.0334	1.08
0.0367	1.062
0.04	1.055
0.0434	1.018
0.0467	1.024
0.05	0.987
0.0534	0.974
0.0567	0.958
0.06	0.93
0.0634	0.927
0.0667	0.905
0.07	0.886
0.0734	0.871
0.0767	0.864
0.08	0.846
0.0834	0.833
0.0867	0.814
0.09	0.802
0.0934	0.786
0.0967	0.78
0.1	0.761
0.1034	0.748
0.1067	0.733
0.11	0.72
0.1134	0.704
0.1167	0.695
0.12	0.683
0.1234	0.67
0.1267	0.657
0.13	0.648
0.1334	0.636
0.1367	0.623
0.14	0.614
0.1434	0.601
0.1467	0.589
0.15	0.579
0.1534	0.57
0.1567	0.557
0.16	0.548

IT-MW08 Slug Test 3
PBOW, Groundwater Investigation

Elapsed Time	Input 1
0.1634	0.535
0.1667	0.526
0.17	0.517
0.1734	0.507
0.1767	0.498
0.18	0.488
0.1834	0.479
0.1867	0.469
0.19	0.46
0.1934	0.451
0.1967	0.444
0.2	0.435
0.2034	0.426
0.2067	0.419
0.21	0.41
0.2134	0.401
0.2167	0.394
0.22	0.388
0.2234	0.379
0.2267	0.372
0.23	0.363
0.2334	0.357
0.2367	0.35
0.24	0.344
0.2434	0.338
0.2467	0.329
0.25	0.325
0.2534	0.316
0.2567	0.31
0.26	0.307
0.2634	0.3
0.2667	0.294
0.27	0.288
0.2734	0.281
0.2767	0.275
0.28	0.272
0.2834	0.266
0.2867	0.26
0.29	0.256
0.2934	0.25
0.2967	0.244
0.3	0.241
0.3034	0.235
0.3067	0.231
0.3234	0.209
0.34	0.191
0.3567	0.172
0.3734	0.159
0.39	0.147
0.4067	0.137

IT-MW08 Slug Test 3
PBOW, Groundwater Investigation

Elapsed Time	Input 1
0.4234	0.125
0.44	0.119
0.4567	0.109
0.4734	0.103
0.49	0.097
0.5067	0.094
0.5234	0.087
0.54	0.084
0.5567	0.081
0.5734	0.078
0.59	0.072
0.6067	0.068
0.6234	0.065
0.64	0.062
0.6567	0.059
0.6734	0.059
0.69	0.056
0.7067	0.053
0.7234	0.053
0.74	0.05
0.7567	0.046
0.7734	0.046
0.79	0.043
0.8067	0.043
0.8234	0.043
0.84	0.04
0.8567	0.04
0.8734	0.037
0.89	0.037
0.9067	0.034
0.9234	0.034
0.94	0.034
0.9567	0.031
0.9734	0.031
1.1734	0.021
1.3734	0.015
1.5734	0.009
1.7734	0.006
1.9734	0.003
2.1734	0
2.3734	0
2.5734	-0.006
2.7734	-0.006
2.9734	-0.006
3.1734	-0.009
3.3734	-0.009
3.5734	-0.009
3.7734	-0.012
3.9734	-0.012
4.1734	-0.012

IT-MW08 Slug Test 3
PBOW, Groundwater Investigation

Elapsed Time	Input 1
4.3734	-0.012
4.5734	-0.015
4.7734	-0.015
4.9734	-0.015
5.1734	-0.015
5.3734	-0.015
5.5734	-0.018
5.7734	-0.015
5.9734	-0.018
6.1734	-0.018
6.3734	-0.018
6.5734	-0.018
6.7734	-0.018
6.9734	-0.018
7.1734	-0.018
7.3734	-0.021
7.5734	-0.021
7.7734	-0.021
7.9734	-0.021
8.1734	-0.021
8.3734	-0.021
8.5734	-0.021
8.7734	-0.021
8.9734	-0.021
9.1734	-0.021
9.3734	-0.025
9.5734	-0.021
9.7734	-0.025
9.9734	-0.021

APPENDIX H

RESPONSE TO TECHNICAL COMMENTS

RESPONSE TO COMMENTS
SITE-WIDE GROUNDWATER INVESTIGATION
FORMER PLUM BROOK ORDNANCE WORKS
SANDUSKY, OHIO
MAY 1997

Comments of CELRN-EP-R-D

Comment 1: **Pg ES-1, second paragraph: After "(DERP)," add Formerly Used Defense Sites (FUDS)."**

Response 1: The paragraph has been changed as requested.

Comment 2: **Pg ES-1, Sitewide Hydrogeology paragraph: Change "solutional enlarged fractures" to "solutionally enlarged fractures."**

Response 2: The statement has been revised.

Comment 3: **Pg ES-1 and ES-2, West Area Red Water Ponds and TNT Area C: For clarify can these areas be discussed in separate summary paragraphs. Discussing them separately in the same paragraph is confusing.**

Response 3: The discussion of TNT Area C and the West Area Red Water Ponds have been separated.

Comment 4: **Pg ES-3, first paragraph: Edit fourth sentence. Change "Variety of metals" to "A variety of metals." Reword last sentence in paragraph.**

Response 4: The paragraph has been revised.

Comment 5: **Pg 1-4, third line: Change "water-bearing zoner" to "water-bearing zone."**

Response 5: The term has been corrected.

Comment 6: **Pg 1-1, first paragraph: After "(DERP)" add "Formerly Used Defense Sites (FUDS)." Change appropriate sentence to "The former Plum Brook Ordnance works (PBOW) in Sandusky, Erie County Ohio is a DERP FUDS project currently being managed and technically overseen by the Nashville District of USACE." Change "geographical location" to "geographic location."**

Response 6: The paragraph has been changed as requested.

Comment 7: **In association with Section 1-1 or 2.0 please add a figure identifying the**

various areas of concern discussed in this report (e.g., West Area Red Water Ponds, TNT Area C, etc.).

Response 7: Figure 1-2 has been added showing the geographic areas discussed.

Comment 8: **Pg 1-3, second paragraph, sixth line: change "interception" to "intersection."**

Response 8: The text has been corrected.

Comment 9: **Pg 1-5, first line: change "in the north-central Ohio" to "in north-central Ohio."**

Response 9: The statement has been changed.

Comment 10: **Pg 2-1, Section 2.1, middle of first paragraph: Here and elsewhere in the document including the drill logs, change "Cambell" to "Campbell." Also, please provide some explanation as to why IT-MW06 required renaming to IT-MW10.**

Response 10: The document has been revised to use the correct spelling, Campbell. Monitoring well IT-MW06 was renamed IT-MW10 because there is an existing well named IT-MW06. When the work plan was written, a new well was inadvertently given the same name. Therefore, it was necessary to rename IT-MW06 to IT-MW10. Clarification added to the text.

Comment 11: **Tables and text, IT-MW06 or IT-MW10: Be consistent a to which you use in the tables and text.**

Response 11: The document has been checked to use IT-MW10 in lieu of IT-MW06 throughout.

Comment 12: **Figures 2-1, 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 5-1, 5-2: Can the background (lightly drawn) lines be darkened so that they are legible?**

Response 12: The background features have been darkened in the referenced figures.

Comment 13: **Pg 2-4, Section 2.7, third line: change "east of the Cambell Road" to "east**

meet the specific objective discussed.

Comment 16: **Tables 4-1 thru 4-6: Please add a footnote explaining what the empty data boxes mean (e.g., analyzed for but below detection limits). Also, rather than "no" and "yes" for the "Sample filtration" row use "unfiltered" and "filtered."**

Response 16: The tables have been revised to include "ND" in previously empty cells to indicate that these were non-detects. The sample filtration columns have been revised as suggested.

Comment 17: **Pg 4-3 and elsewhere: Change "suspended soils" to "suspended solids."**

Response 17: The text has been changed.

Comment 18: **Pg 4-5, second line: Change "exceed the their" to "exceed their."**

Response 18: The text has been changed.

Comment 19: **Pg 4-8, Section 4.2.2.6, last sentence: The sentence concerning no RBC for cyanide is unnecessary in this section. Please delete the sentence.**

Response 19: The sentence has been removed.

Comment 20: **Pg 5-1, first paragraph: Change "hydrogeological" to "hydrogeologic."**

Response 20: The text has been corrected.

Comment 21: **Pg 5-1, Section 5-1, first paragraph: Change "contaminants migration" to "contaminant migration."**

Response 21: The text has been revised.

Comment 22: **Pg 5-2, Overburden Water-Bearing Zone section (should be section numbered 5.2.1), second paragraph: In the list of four general areas of concern where contours were constructed TNTC occurs twice. Is the second occurrence supposed to be TNTB? Also, in the last sentence of the paragraph change "In a close vicinity" to "In close vicinity."**

Response 22: The text has been revised to indicate that the four areas are the WARWP/TNTC, TNTA, TNTB, and Pentolite Road areas. The last sentence has been changed as requested.

Comment 23: **Pg 5-3, first paragraph: Please provide rationale as to why falling head tests could not be conducted on "extremely low yield wells," and consider this slug test method for future groundwater investigations at Plum Brook. Please cite or present the equation(s) used to determine the hydraulic conductivity value, and if only one equation was used, was it applicable to the conditions of IT-MW08?**

Response 23: When well yield is extremely low, slug tests (either falling-head or -head) can not be performed within a reasonable time frame. At PBOW, well yields in many overburden wells vary with the season. Therefore, when well yield is relatively high, slug tests can be conducted. In future groundwater investigations at this site, we will attempt to schedule slug test/monitoring well installation to coincide with the wet season so that wells will have higher well yield. The method used for calculating hydraulic conductivity has been added to appendix G. The method/equation is applicable to all overburden wells including IT-MW08.

Comment 24: **Pg 5-3, Bedrock Water-Bearing Zone section (should be section numbered 5.2.2), first paragraph: Change "solutional enlarged fractures serve as preferential" to "solutionally enlarged fractures serve as a preferential."**

Response 24: The text has been changed.

Response 25: **Pg 5-3, Bedrock Water-Bearing Zone section (should be section numbered 5.2.2), second paragraph, first line: Change "overburden water-bearing zone" to "bedrock water-bearing zone."**

Response 25: The text has been changed.

Comment 26: **Pg 6-1, Section 6.1.1: change "solutional enlarged fractures" to "solutionally" enlarged fractures.**

Response 26: The text has been changed.

RESPONSE TO COMMENTS
SITE-WIDE GROUNDWATER INVESTIGATION
FORMER PLUM BROOK ORDNANCE WORKS
SANDUSKY, OHIO
MAY 1997

Appendix A

Comment 27: **Well Construction diagrams, bottom of page: change "USAEC" to "USACE" and "Bases" to "Based." Add an entry for "elevation Top of Casing*."**

Response 27: The well construction diagrams have been corrected and modified as suggested.

Comment 28: **Well Construction diagrams: According to these diagrams none of the new wells has a grout collar and one has an 8.6 foot bentonite seal. If it is correct that the borings are bentonite sealed from top of sand pack to ground surface then remove the two "Cement Grout" labels and blacken the "grout" area.**

Response 28: The thickness of the bentonite on well construction diagrams were inadvertently mislabeled. For all newly installed wells, a 2-foot bentonite seal was placed. The well construction diagrams have been corrected.

Comment 29: **Well Construction diagrams, two numbers top left: One of these numbers appears to refer to top of riser. Is the top most number the "Top of Well Protection?" If so, does IT-MW9 really had a 1 foot difference between the top of riser and top of protective casing? EM 1110-1-400 (pg 5-7, section 5-9, c 6) allows no more than 0.2 feet.**

Response 29: The top most number is the height of the top of well protection. The 3.5 feet as shown in the well construction diagram should be 2.5 feet. This error has been corrected.

Comment 30: **Well Construction Diagrams: There are two diagrams for IT-MW9 and none for piezometer IT-MW07.**

Response 30: Duplicate well construction diagram for IT-MW9 was deleted. IT-MW07 is a temporary piezometer for which a well construction diagram was not generated.

Comment 31: **Drill Logs: See general drill log comments supplied to IT under separate cover.**

Response 31: The comments of CELRN-EP-R-D concerning IT completion of HTRW drilling

logs (8/4/97) have been reviewed. IT will incorporate these comments in future field operations and in preparatioan of reports for the PBOW projects.

Comment 32: **Drill Logs, Block 4: What state?**

Response 32: The state has been added to the drilling logs.

Comment 33: **IT-MW10 log, Column c: what is "plae?" Where are the lines [solid or dashed (estimated)] indicating the contact between the different materials being described?**

Response 33: It should be "pale." Correction has been made. The lines indicating lithological contact have been added.

Comment 34: **IT-MW10 log, Column c, sheet 3: What material was encountered in the interval 10-18.1 feet?**

Response 34: Re-examining the IT-MW10 boring log indicated that lithology between 10-18.1 feet was predominantly silt.

Comment 35: **IT-MW9, construction diagram and log: The diagram shows total depth of 13.8 feet while the log indicates the boring went to 15 feet. Is this an example of why we prefer the field completed logs, i.e., data transcription mistake? Please reconcile this discrepancy.**

Response 35: The total depth of 15 feet is the augered depth. The depth of 13-8 feet as shown in the construction diagram is the total depth of the well borehole when measured prior to well installation. The discrepancy occurs because broken shale backfilled 1.2 feet of the borehole.

Comment 36: **Geotechnical analyses: Section 2.1, third paragraph, indicates that three discrete soil samples were collected from each borehole for geotechnical testing. Where are the geotechnical results for piezometer IT-MW07? Likewise where are the sieve analysis results for IT-MW06, 07, 09 and the filter pack material?**

Response 36: Geotechnical samples were not collected from IT-MW07 as this was a temporary piezometer (open hole) installed for the purpose of collecting a

groundwater sample in the area where the proposed well could not be installed. The text has been revised to correct this discrepancy. All collected samples were submitted for moisture content testing, while selected samples were submitted for Atterberg Limits (clay/clayey soils) or sieve analysis (sand/sandy soils) in accordance with Section 2.5.1 of the SOW ("Specific soil samples to be tested, along with type of test, shall be determined by the AE after reviewing the boring logs and samples") and as proposed. As the three monitoring wells were installed in overburden materials which were predominantly clay or clayey silts, all but one sample (collected from IT-MW08) were submitted for Atterberg Limits tests in lieu of the sieve analyses. The filter pack material is the same as used in existing wells (20/30 silica sand). The lithology of the overburden materials is predominantly clay and silt throughout the site. Therefore, using the same filter sand and screen in the new wells is believed to be appropriate.

Appendix B

Comment 37: **Development water photos: Section 2.2, first paragraph, last line, indicates "photographs of development water" are in appendix B, however only one photo is presented. Please reconcile this discrepancy.**

Response 37: As stated in Section 2.2 of the report, only IT-MW08 could be developed in accordance with well development criteria. Development of monitoring wells IT-MW09 and IT-MW10 were not completed due to extremely low recharge rates resulting in all water being removed from the wells. These wells were monitored for recharge over several days in order to complete development activities. However, the recharge rates were insufficient to permit completion of development, and were barely sufficient to permit groundwater sample collection. As a result, well development was not completed for these wells and no final development water sample could be collected or photographed.

Appendix D

Comment 38: **Pg D-4, Section D.2.4, second paragraph: What were the level of contaminants found in the potable water sample?**

Response 38: The levels of contaminants in the potable water sample are presented in the referenced paragraph:

Chloroform at 15 ug/L (B)
Bromodichloromethane at 4.3 ug/L
Dibromochloromethane at 1.4 ug/L (J)
Calcium at 45,500 ug/L
Copper at 78.6 ug/L
Magnesium at 11,900 ug/L
Sodium at 16,700 ug/L
Zinc at 31.1 ug/L.

The paragraph also stated that nitroaromatics were detected which is incorrect. The reference to nitroaromatics has been removed.

Comment 39: **Table D-4: Extraction method for Pesticides/PCBs should be 3520.**

Response 39: The extraction method will be added to the referenced table.

Comment 40: **Pg D-6, Section D.3.1.1: MDL studies should be performed for each analysis performed, each instrument and each matrix. Change text accordingly.**

Response 40: The text will be changed accordingly.

Comment 41: **Pg D-12, Section D.4.0: Define the requirements of definitive data.**

Response 41: The requirements of definitive data as published in EPA 540-R-93-071 will be added to this section.

Comment 42: **Pg D-12, Section D.5.0, second paragraph: Change equipment "rinses" to "rinsates."**

Response 42: The statement has been changed.

<u>Appendix F</u>

Comment 43: **Provide key for Lab qualifiers "GU" and "X1."**

Response 43: 'GU' are laboratory qualifiers which indicate that the detection limit reported is elevated due to matrix interferences encountered during the analysis. 'X1' is

also a laboratory qualifier which indicates that the result reported could not be confirmed due to the presence of interferences caused by the surrogate standard. This qualifier was specifically defined for the SW-846 modified 8330 analysis. These definitions will be added to the text for future reference.

Comment 44: **pages labeled Blank Corrected: As commented above the COE does not blank correct data. Please remove all statements to that effect.**

Response 44: See response to comment 15.

Comment 45: **Executive Summary. Third Paragraph. Middle of paragraph. Check seventh sentence.**

Response 45: This sentence has been revised to read "Groundwater flow regime in the bedrock water bearing zone is believed to be influenced by the orientation and connectivity of solutionally enlarged fractures."

Comment 46: **Executive Summary. Pg. ES-3. First Paragraph. Edit fourth sentence.**

Response 46: The sentence has been revised to state that "At least one BTEX compound was detected in <u>all</u> bedrock wells, except..."

Comment 47: **Reword last sentence in this paragraph.**

Response 47: The sentence has been revised.

Comment 48: **Section 1.3. Pg. 1-4. Change "water-bearing zoner" to "water-bearing zone."**

Response 48: The text has been changed.

Comment 49: **Section 1.4. Pg. 1-4. If Lewis Research Center has not been used before in this document, spell it out the first time it is used.**

Response 49: The Lewis Research Center acronym is defined on Page 1-2.

Comment 50: **Figures 2-1, 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 5-1, 5-2 are not clear.**

Response 50: See response to comment 12.

Comment 51: **Section 2.7, Campell Road is spelled differently throughout document. Be consistent with spelling.**

Response 51: See response to comments 10 and 13.

Comment 52: **Section 3-1, Middle of paragraph. The COE does not blank correct data. Please remove all statements.**

Response 52: See response to comment 15.

Comment 53: **TABLES 4-1 through 4-6. Provide a footnote for all the blank spaces in the tables and on TABLE 4-3 circle whether the sample was filtered or unfiltered.**

Response 53: See response to comment 16.

Comment 54: **Section 4.1.2.3. Page 4-5. Edit first full sentence.**

Response 54: The sentence has been revised.

Comment 55: **Section D.2.4. Second paragraph. What were the levels of contaminants found in the potable water sample?**

Response 55: See response to comment 38.

Comment 56: **TABLE D-4. Extraction method for Pesticides/PCBs should be 3520.**

Response 56: See response to comment 39.

Comment 57: **Section D.3.1.1. MDL studies should be performed for each analysis performed, each instrument, and each matrix. Change text accordingly.**

Response 57: See response to comment 40.

Comment 58: **Section D.4.0. Page D-12. Define the requirements of definitive data.**

Response 58: See response to comment 41.

Comment 59: **Section D.5.0. Second Paragraph. Change equipment "rinses" to "rinsates."**

Response 59: See response to comment 42.

Comment 60: **Appendix F. Provide key for Lab Qualifiers "GU" and "X1." Appendix F. Pages labeled Blank Corrected. See Comment #7 above.**

Response 60: See responses to comments 43 and 44.

RESPONSE TO OEPA COMMENTS
DRAFT GROUNDWATER INVESTIGATION REPORT
FORMER PLUM BROOK ORDNANCE WORKS,
SANDUSKY, OHIO

Comments of Ellen J. Gerber, Ohio EPA

Comment 1.a: **International Technology Corporation (IT) noted difficulty with sampling wells IT-MW09 and IT-MW10 following development by surging and attributed this to seasonal fluctuation in water levels. Ohio EPA believes that a more likely source was the surging itself. Ohio EPA recommended not using this technique in our review of the sampling and analysis plans for the site because of the fine-grained nature of the overburden and the risk of reducing hydraulic response.**

Response 1.a: The OEPA recommended against using surging during well sampling at PBOW in their comments dated November 11, 1996, which was the second set of comments on the work plans. Originally, OEPA commented on the work plans on September 5, 1996. At the time that the second set of comments were received field activities associated with the groundwater investigation had already been completed. However, the OEPA's recommendation is noted and will be incorporated during future field activities.

Comment 1.b: **Ohio EPA also recommended maximum screen lengths of 5 feet for the new wells. Samples collected from wells with longer screens tend to misrepresent actual ground water concentrations due to possible dilution effects.**

Response 1.b: As with comment number 1.a, the recommendation for 5-foot screen lengths in the overburden wells was not received until after the completion of field activities. However, as stated in the response document for the November 11, 1996, comments, the use of 10-foot screen lengths is in accordance with minimum USACE requirements.

A five-foot screen interval is not recommended for new monitoring wells at PBOW (where aquifer conditions permit the installation of longer screen intervals) for the following reasons:

- Groundwater samples obtained over broader aquifer thicknesses are more likely to represent water quality that a possible resident or industrial worker would be exposed to since water extraction wells are typically screened over greater aquifer thicknesses. Therefore, from a risk analysis perspective

longer screen intervals should provide more representative groundwater quality data.

- Screen intervals longer than 5 feet will allow for greater seasonal fluctuations in water levels, assuring that groundwater samples can be collected under a greater variety of water level conditions

- The 10-foot screen interval is in accordance with minimum USACE requirements

Comment 1.c: **There are numerous typographical errors in the Risk Based Concentrations (RBCs) shown on the tables in Section 4; the value is typically off by an order of magnitude. Consequently, IT appears to have inaccurately highlighted ground water concentrations that exceeded the RBCs. It is possible, though, that the same error involving the decimal point may be repeated in the ground water concentrations reflected on these tables. IT should have included copies of the reporting sheets from the laboratory so any suspected errors in the data could be investigated.**

Response 1.c: The RBCs used in the evaluation of detected constituents in groundwater at PBOW were derived using EPA Region III published RBCs, but using a hazard index (HI) of 0.1 or a cancer risk of 10^{-6}, not an HI of 1 as stated in Section 3.3. These values were selected to provide a first-line indicator that a given chemical in groundwater may be present at levels that are near the low end of the National Contingency Plan (NCP) target risk range. Section 3.3 has been revised to correct the erroneous HI discussion.

Comment 2.a: **This investigation did not determine the horizontal and vertical limits of contamination in any of the areas of concern except for semi-volatiles in the vicinity of TNT Area B. Future investigations should delineate the rate and extent of contamination in the areas of concern at the facility.**

Response 2.a: A subsequent groundwater investigation is currently planned for PBOW, and will be conducted beginning in August 1997. This supplemental or follow-on investigation will consist of two semi-annual groundwater sampling events and four quarterly groundwater level measurement events on a more site-wide basis. A total of fifty-nine groundwater monitoring wells will be sampled on two occasions, including twelve (12) new wells installed to fill identified data gaps in the groundwater monitoring network at PBOW.

Comment 2.b: **Ohio EPA notes that for the purposes of comparing the downgradient to upgradient ground water data, the chemistry in the overburden is typically quite different from the chemistry in the bedrock in this area.**

Response 2.b: Agreed.

Comment 3: **IT should explain the rationale for filtering samples for nitroaromatics. Method 8330 states that samples collected for this type of analysis should be subject to the same collection and storage methods as for semi-volatiles and that any filtering is actually done by the laboratory on an as-needed basis, not in the field.**

Response 3: Groundwater samples collected for nitroaromatic analyses were normally not filtered. However, when a given well could not be purged or developed to a turbidity of less than 20 NTUs, an additional sample was collected and filtered to provide an indication of whether any detected nitroaromatic compounds were due to suspended solids in the sample or were primarily present in the dissolved phase. This supplemental sample does not affect the original unfiltered sample or corresponding results, it merely serves to provide additional analytical information relevant to specific wells.

Comment 4: **Well IT-MW06 is shown with this designation on the tables but is designated as IT-MW9 on the maps.**

Response 4: Proposed monitoring well IT-MW06 was renamed to IT-MW10 during the field investigation due to the existence of a previously designated IT-MW06. Tables referencing IT-MW06 have been changed to IT-MW10.