U.S. ARMY ENGINEER DIVISION
HUNTSVILLE, ALABAMA

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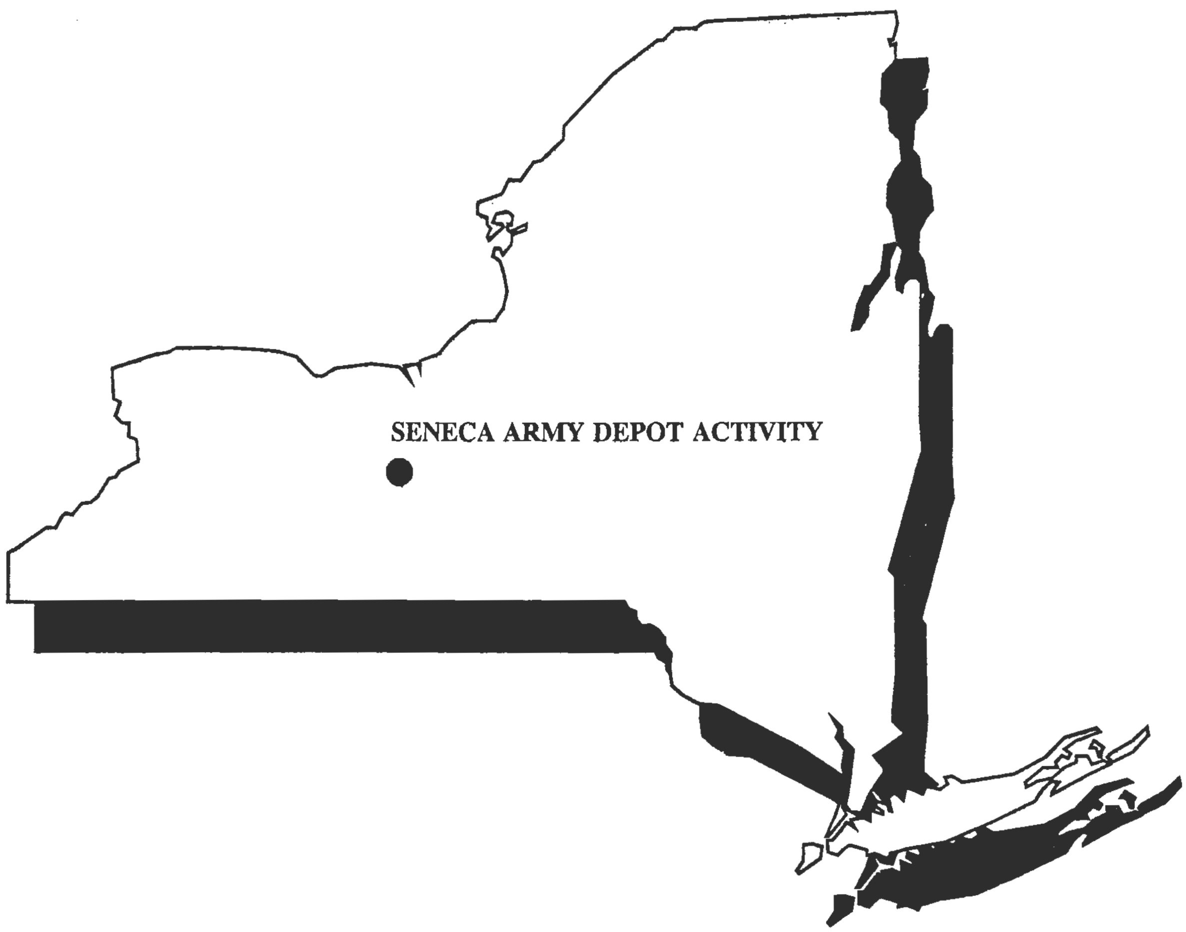

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SECTION C - TECHNICAL SPECIFICATIONS
SOIL AND SEDIMENT REMEDIATION
AT THE OPEN BURNING (OB) GROUNDS

AUGUST 1998

U.S. ARMY CORPS OF ENGINEERS
HUNTSVILLE DIVISION

SECTION C
PLANS AND SPECIFICATIONS
FOR THE REMEDIATION PROJECT AT
SEAD 23 - OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

CONTRACT NUMBER DACA87-95-D-0031

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August 1998

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SECTION 1
BACKGROUND

As part of its continuing program of evaluating its hazardous waste management practices, the Army has completed a Remedial Investigation/Feasibility Study (RI/FS) at the Open Burning Grounds site (SEAD-23) of the Seneca Army Depot Activity (SEDA). The RI/FS has concluded that specific remediation is required with respect to lead-contaminated soils and lead/copper contaminated sediments and that runoff control and periodic monitoring will be required. Additionally, avoidance measures, with respect to Ordnance and Explosives (OE), will be required.

1.1 PROJECT LOCATION

SEDA is a US Army facility located in the town of Romulus, in Seneca County, New York. SEDA occupies approximately 10,600 acres. The facility is bounded by State Route 96A to the west and State Route 96 to the east. Four cities surround Seneca Army Depot Activity: Geneva and Rochester to the northwest, Syracuse to the northeast, and Ithaca to the south.

1.2 REGULATORY STATUS

The Open Burning Grounds of SEAD was included on the Federal Facilities National Priorities List on 13 July 1989. Consequently, all work to be performed under this contract shall be performed according to the Comprehensive Environmental Response Compensation and Liabilities Act (CERCLA) guidance as put forth in the EPA Interim Final "Guidance for Conducting Remedial Investigations/Feasibility Studies under CERCLA", and the "Federal Facility Agreement under CERCLA Section 120 in the matter of Seneca Army Depot, Romulus, New York".

1.3 PROJECT DESCRIPTION

The project description consists of three sections. The first section provides a general description of the Open Burning Grounds. The second section summarizes the previous investigations that have been completed at the site. The third section provides a description of the affected media at the site.

1.3.1 Site Description of SEAD 23 - OB Grounds

Since its inception in 1941 SEDA's primary mission has been the receipt, storage, maintenance and supply of military items. This function includes disposal of military ammunition and explosives by burning and detonation. The OB grounds are located in the northwestern portion of SEDA. Figure 1-1 presents a site plan of SEDA and identifies the location of the OB grounds. The OB area is situated on gently sloping terrain, vegetated with grasses and brush. Drainage is generally to the east-northeast via a series of drainage ditches and culverts into Reeder Creek. There are several poor drainage areas where water collects at certain times of the year. Low surface gradients of less than 40 feet in 2500 feet, and a high fine content in the surface soils and underlying glacial till deposits contribute to poor drainage conditions. Originally, open burning of munitions was conducted directly on the land surface. Due to the poorly drained soils, the individual burn pads were later built up with crushed, broken shale to allow for a drier burn of the munition waste. SEDA still uses the burn trays located in the area for the destruction of munitions. The burn tray is made of metal and is located on a concrete pad. As part of the remediation the contract will include the remediation of soils up to the burn tray's concrete pad and the restoration of the existing access road to the burn tray.

The OB grounds comprise an area of approximately 30 acres within the northern section of the Seneca Army Depot (SEDA). Access to and across the site is provided by a group of looping crushed shale roads that allow access to the individual burning pads. Access to SEDA is controlled by fencing and security patrols around the entire depot. Located within the OB grounds are nine separate burning pads upon which munitions waste were open- burned until 1987.

The burning pads at the site are built on top of the natural glacial till soils. Each burn pad has from 1/2 to 2 feet of broken shale at the surface. Below this are natural soils and/or glacial till. The berms are composed of soils and burn wastes and they surround each burn pad on three sides. There are a total of nine burning pads located within the OB grounds and these range in size from approximately 100 by 100 feet for Pad D to 300 by 800 feet for Pad G. In general, each of the burning pad surfaces are approximately 2 to 3 feet above the surrounding land surface.

Within the OB grounds the land surface drops in elevation from the west towards the east. The overall surface relief is approximately 15 feet over a west to east distance of approximately 4,000 feet. Surface water drains through a series of ditches and surface swales. Due to the nature of the activities at the site these drainages are poorly defined and may be blocked and/or reworked in some areas. On the eastern side of the OB grounds is Reeder Creek into which flows surface water runoff from the OB grounds. This is a perennial creek that is generally less than 1 foot deep and does not exceed 15 feet in width. In places the creek is ponded due to beaver and other natural dams.

The surficial soils at the site are composed of clay, silty loam. These soils are poorly drained and range in thickness from 0 to 18 inches across the site. Due to the poorly drained nature of these soils numerous low lying wet areas exist within the OB grounds. A total of 38 wetland areas have been identified in and around the OB grounds and these range in size from less than 1,000 square feet to 140,000 square feet. These wetlands are widely distributed across the site and are primarily formed within topographic lows.

A total of 35 monitoring wells have been installed, of which 33 are within or directly adjacent to the OB grounds. These monitoring wells have been installed to characterize the subsurface geologic environment, the direction of groundwater flow and the chemistry of the groundwater at the site. In addition to these wells, 87 soil borings and 63 berm excavations have been completed to assist in characterizing the subsurface geology and the chemical composition of the soils at the site. A complete Phase I Ecological Assessment has also been completed.

The surficial geologic deposits present at the OB grounds are composed of glacial tills. The tills range in composition from clayey to sandy and have a high percentage of larger coarse materials within some area of the OB grounds. The till has a relatively low hydraulic conductivity which is consistent with the poorly sorted and dense nature of the unit.

The bedrock at the OB grounds is composed of Devonian age Hamilton Group shale. This Hamilton Group is subdivided into four formations all of which are primarily fossiliferous, calcareous shales. According to the Geologic Map of New York - Finger Lakes Sheet (1970), the bedrock beneath the OB grounds is the Ludlowville Formation. This formation is characterized by gray, calcareous shales and mudstones, and thin limestones with numerous zones of abundant fossils. At the surface the shale is slightly to moderately weathered and fissil. The thickness of the weathered shale zone below the till ranges from approximately 1 foot to as much as 15 feet across the site but is generally only a few feet thick. The depth to the competent shale is generally no more than 15 feet at the site.

Based upon water level measurements made in the on-site monitoring wells, groundwater flow is primarily from west to east across the site. The water table surface drops in elevation from a high of 636 feet above MSL on the west, to a low of 618 feet above MSL on the eastern side of the site adjacent to Reeder Creek. Groundwater flow directions within the till/weathered shale aquifer are also primarily from the west to the east.

1.3.2 Previous Investigations at SEAD 23 - OB Grounds

This remediation project is being conducted by the Army under the requirements of the Comprehensive Environmental Responsibility, Compensation, and Liability Act (CERCLA), as amended. The site has been the subject of several previous investigations including an RIFS. Some of the results of the RIFS including site characterization and the analytical results are discussed in the following sections. Additional detailed information if required may be available from the RI report and/or the FS reports.

1.3.3 Description of Affected Media at SEAD 23 - OB Grounds

1.3.3.1 Soils

Soils at the OB Grounds will be excavated for two reasons. Some soils which have lead levels below 500 mg/kg such as the low lying hills will be excavated and screened by EODT for OE clearance. The extent of these soils will depend on the amount of excavation that is requires to meet the work objectives of EODT's Ordnance and Explosives Removal Action Work Plan dated November 1997. In addition to the soils excavated for OE clearance purposes additional soils will be excavated to meet the remediation objective of 500 mg/kg of lead in soils. The extent of the soil that has lead at over 500 mg/kg which will be excavated during this removal action is summarized on figures 3 and 4 and shown in more detail on Figures 6 through 13. The extent of the soil shown on these figures should be consider preliminary because the areas may be expanded based on the results of confirmatory sampling done in the excavation. There are approximately 19,500 cubic yards of soil with lead over 500 mg/kg to be excavated and transported off-site for disposal. Approximately 16,250 yards of this material will require solidification/stabilization prior to disposal. The amount of soil that will require solidification may change based on the TCLP testing results for the samples taken from the stockpiled soils or the confirmatory sampling done in the excavations. A lot of soil sampling and analysis has been done at the OB Grounds. Figures 4 shows where the soil samples were taken and tables 2-1 through 2-11 presents a summary of the analytical results for the soil samples. This data was used to define the amount of soils that will be excavated. Based on the sampling results the amount of soil with lead levels over 500 mg/kg were estimated. The areas with lead levels over 500 mg/kg are shown on figure 6 through 13 along with the coordinates that define these areas that are scheduled to be excavated. Geologic cross sections of the site are presented in figures 17 through 20. The cross sections indicate that the areas to be excavated consist of fill over a few feet of till with a layer of weathered shale over the bedrock. The cross sections also show the level of the groundwater from January 1992.

1.3.3.2 Dewatering of excavations - Groundwater and Precipitation

Some of the soils that will be excavated are located below the groundwater table. This means that these soils/excavations will have to be dewatered. The groundwater that is removed during the dewatering operation will have to be treated before it is discharged. The groundwater sampling

and analysis that has been conducted at the OB Grounds is summarized on Table 2-14 which shows that the groundwater may exceed New York State TAGM limits for some metals. The groundwater data also shows that by filtering the samples the concentration of metals in the groundwater was typically brought down below the TAGM limits. This indicates that filtration may be a viable treatment alternative if treatment is required. The need for treatment will depend on the permit requirements which will be negotiated between the regulators and the contractor.
The volume of groundwater that will need to be dealt with during the dewatering of the soils and excavations is dependent on the groundwater elevation at the time of the excavation, how long the excavations are kept open, the hydraulic conductivity of the till and the weathered shale, and the soil's porosity. The groundwater elevations recorded during January 1992 and April 1992 are presented on figures 14 and 15. The hydraulic conductivity of the till ranges from 1.54 x 10^{-3} to 8.36 x 10^{-5} cm/sec with an average hydraulic conductivity of 6.61 x 10^{-4}cm/sec. The hydraulic conductivity of the weathered shale ranges from 1.13 x 10^{-3} to 6.01 x 10^{-5} cm/sec and averages 1.27 x 10^{-3}cm/sec. The porosity of the till is estimated at 0.33. Most of the planned excavations will be above the groundwater table. Some of the planned excavations will extend down below the groundwater table. For example the planned excavation at pad B will extend down eight feet which will bring the excavation almost down to bedrock. The pad B excavation will extend down below the groundwater table therefore dewatering of this excavation and the soils from this excavation will be required. The estimated volume of groundwater contained in the pad B excavated soil is estimated at 48,000 gallons which is based on an estimated volume of soil below the groundwater table of 726 cubic yards and a porosity of 0.33. The total quantity of groundwater to be disposed of will also include the groundwater that flows into the excavation while the work is in progress. In addition to groundwater the contractor will have to handle any stormwater which collects in the excavations. This volume of stormwater could be significant therefore the contractor should plan each excavation carefully so that the potential for collecting stormwater that requires pumping from the excavations is minimized. Figure 16 presents the average precipitation by month for the area. The groundwater/stormwater that is pumped during the dewatering of the excavations will have to be collected, treated, and sampled prior to being discharged.

1.3.3.3 Reeder Creek - Surface Water and Sediment

Some of the sediments in Reeder Creek are scheduled to be excavated as part of this remediation project. In order to accomplish this the stream will need to be diverted and the sediments dewatered. This section presents a description of Reeder Creek including the flow rates, cross sections and the depth of sediments to be excavated.

Reeder Creek is a small, second order perennial stream that originates on the SEDA. Reeder Creek flows in a northwesterly direction past the OB grounds and then turns sharply to the west after leaving the SEDA property where it discharges into Seneca Lake. The total drainage basin of Reeder Creek is 3,211 acres (5.02 square miles). Approximately 71 percent (of the drainage basin) is within the confines of the Depot. The drainage area up gradient of the OB grounds is approximately 1,503 acres. The 30-acre OB grounds comprises 0.9 percent of the total Reeder Creek drainage basin.

The normal width of Reeder Creek is 4 to 10 feet, and typical maximum depths range from 1 to 7 inches. Sections of the stream which have been influenced by beaver dams are up to 15 feet wide and 3 feet deep. During high flow events width and depth increase, although the steep banks along much of the stream adjacent to the OB grounds limit the width of the flood plain as shown in Figures 21 and 22.

The substrate of Reeder Creek is heavily influenced by the occurrence of shale near and at the surface. Most of the stream bottom consists of coarse, angular gravel as well as angular cobbles. There is some deposition of interstitial silt and also a small amount of sand. In some places, the stream bed consists of exposed bedrock. Nearly all components of the substrate are dark gray. The average depth of sediment, including gravel, is approximately 3 inches. In general, the stream bottom which usually comes in contact with the stream water of Reeder Creek is characteristic of mountain streams with loose cobbles. Such streams usually have Manning's N values (a measure of "stream resistance") of 0.040 to 0.050 (Milhouse, et al., 1984).

The velocity of water in a stream is a function of width, depth, and gradient. The minimum depth at which velocity measurements could be obtained with the Marsh McBirney flowmeter was approximately 3 inches, so velocity in shallow, riffle areas could not be determined. Transects where stream velocity was measured were chosen because stream flow was laminar. The highest water velocity measured at any transect was 0.11 feet per second (fps) at Station SW-196. The lowest stream velocity of 0.03 fps was measured at the widest transect SW-130. Average stream velocities ranged from 0.02 fps at SW-130 to 0.06 fps at SW-140.

The discharge measured at each transect was 0.1 cubic feet per second (cfs). Discharge was measured on November 19 and 20, 1991. Rainfall during and prior to these measurements was sparse. This suggests that there is little discharge of groundwater or surface water via tributaries into Reeder Creek near the OB grounds during the relatively dry base flow conditions.

The surface water elevation of Reeder Creek showed little variability during field studies near the OB grounds (Table 3-2). The maximum change in surface water elevations that was directly measured at any station was 2.90 inches at Station SW-150. Since the drainage area upstream of the OB grounds is relatively small (1,503 acres or 2.35 square miles), Reeder Creek is likely to return to base flow conditions shortly after any precipitation event.

Precipitation data from the nearest monitoring station, Aurora Research Farm, was reviewed to gain a perspective on the seasonal and historical variations in the water surface elevations of Reeder Creek. This data indicates that November 1991 was the second wettest month of the year with 3.63 inches of precipitation. April was the wettest month with 4.60 inches of precipitation. Consequently, the stream elevations measured in Reeder Creek during November may have been somewhat higher than for most of the rest of the year. Average monthly precipitation based on data collected from 1958 through 1991, as shown in Figure 16, indicates that the highest rainfall amounts normally occur during June and the lowest amount of precipitation occurs during January. Seasonal stream flow would be expected to mimic the precipitation data. Historically maximum stream flows are expected to occur during maximum rainfall events. Based on data from the Aurora Research Farm, a precipitation event of 3.25 inches per 24 hours occurs once every 5 years; 3.8 inches per 24 hours every 10 years; and 5 inches per 24 hours every 100 years. Minimum stream flow would be expected during prolonged dry spells. The lowest monthly precipitation value recorded at Aurora was 0.10 inches during October 1963. Samples of surface water were collected and analyzed during the RI. The location of the surface water samples are shown on figure 4 and the results of the laboratory analysis of the surface water samples are presented on table 2-13

Sediments have been characterized during the RI. Figure 4 shows the location of the sediment samples that have been collected and Table 2-12 presents the laboratory results for the sediment samples. Figures 4, 12 and 13 show the areas where sediment is scheduled to be excavated along with the coordinates that define the areas of sediments in Reeder Creek that are scheduled for excavation.

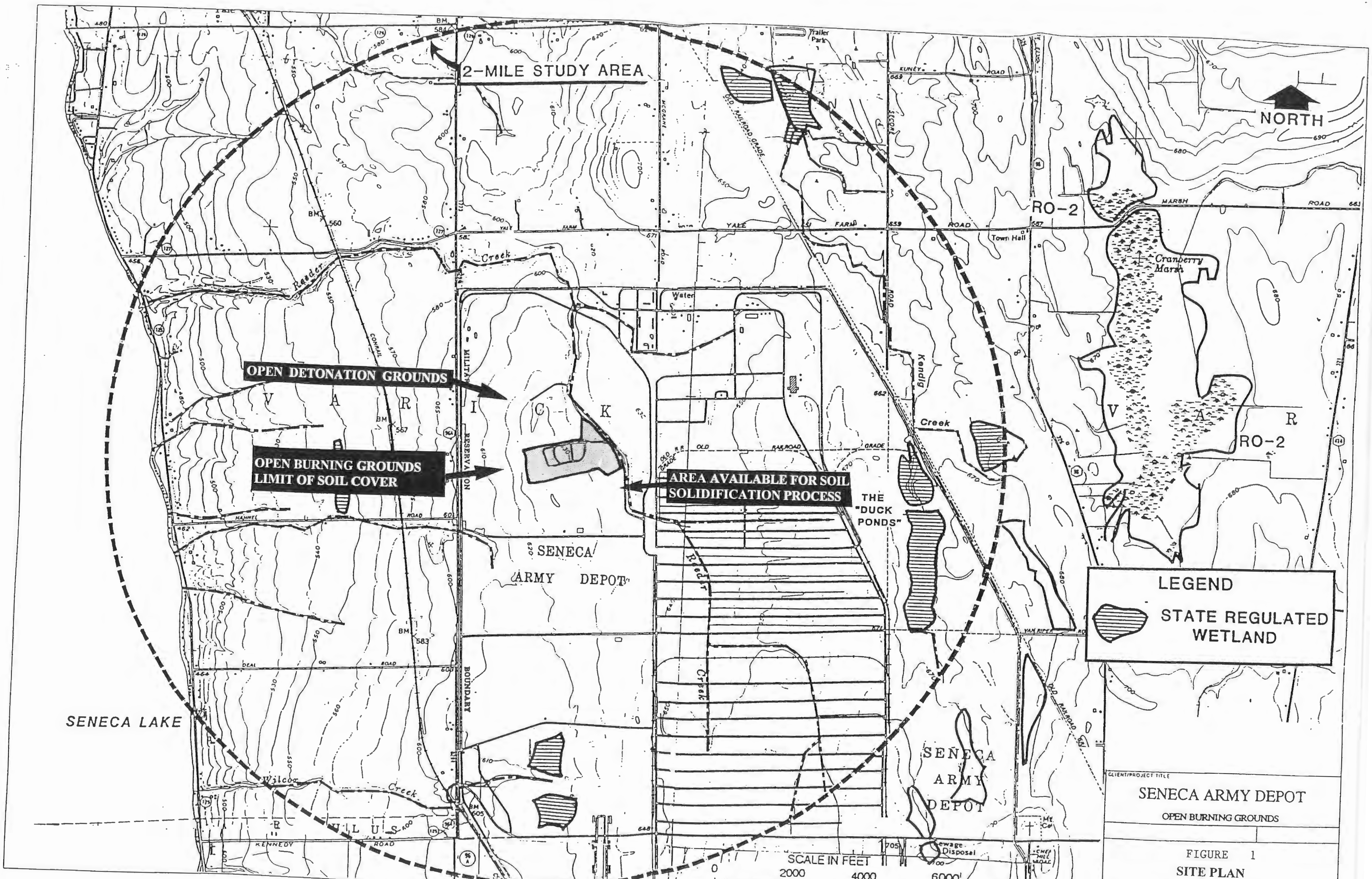
2-MILE STUDY AREA
NORTH
OPEN DETONATION GROUNDS
OPEN BURNING GROUNDS
LIMIT OF SOIL COVER
AREA AVAILABLE FOR SOIL
SOLIDIFICATION PROCESS
THE
"DUCK
PONDS"
SENECA
ARMY DEPOT
SENECA LAKE
Cranberry
Marsh
RO-2
Town Hall
Water
Trailer
Park
Kendig
Creek
Reeder
Creek
Wilcox
Creek
MILITARY RESERVATION BOUNDARY
KENNEDY ROAD
YALE FARM ROAD
MARSH ROAD
Sewage
Disposal
LEGEND
STATE REGULATED
WETLAND
SCALE IN FEET
0
2000
4000
6000
CLIENT/PROJECT TITLE
SENECA ARMY DEPOT
OPEN BURNING GROUNDS
FIGURE 1
SITE PLAN

TABLE 1

AREAS FOR SOIL REMEDIATION

SENECA ARMY DEPOT
OB GROUNDS

CASE	LOGIC	DESCRIPTION OF AREA TO BE REMEDIATED	TOTAL AREA-ft2	AVERAGE DEPTH-ft	TOTAL VOLUME-yd3	SAMPLING LOCATIONS
1	Soils exceeding the TCLP limits	Pad B - Whole berm	1,640	3.3	200	BE-B-1 thru 4
		Pad B - Whole pad from 0 to 2 feet	2,800	2.0	207	PB-B-1
		Pad B - Whole pad from 2 to 9 feet	2,800	7.0	726	
		Pad F - Southeast side of berm	3,500	4.6	596	BE-F-1, 2, 5 & 6
		Pad F - Whole pad from 0 to 2 feet	12,000	2.0	889	PB-F-1 thru 6
		Pad H - South side of berm	1,700	7.2	453	BE-H-2 & 3
		Pad H - Half of eastern berm	1,050	2.0	78	BE-H-5
		Pad H - Around PB-H-2 from 0 to 4 feet	3,200	4.0	474	PB-H-2
		TOTAL			3,624	
				Cumulative Total	3,624	
2	Remote areas with elevated metals (Ba,Cu,Pb,Zn > 1,500 mg/kg and PAH's above TAGM)	Reeder Creek sediments North of OD Grounds	7,000	1.0	259	SW-120 ,300 ,310 , & 320
		Reeder Creek sediments near OB Grounds and upstream	7,200	1.0	267	SW-140, 150
		Eastern portion of Low Hill	2,500	4.0	370	LH-31 &32
		TOTAL			896	
				Cumulative Total	4,521	
3	All berms with elevated metals (Ba,Cu,Pb,Zn > 1,500 mg/kg and PAH's above TAGM)	Pad A - North half of berm	1,280	3.3	156	BE-A-1 & 3
		Pad C - Whole berm	1,820	3.8	256	BE-C-1 thru 6
		Pad D - North half of berm	1,430	4.3	228	BE-D-1 & 3
		Pad G - South side of berm	11,000	5.9	2,404	BE-G-2, 3, 4, 5, 6, 9, 10 & 11
		Pad J - Hot spots around BEJ-10 and BEJ-13	1,110	4.6	189	BE-J-10/14 & 13
		TOTAL			3,233	
				Cumulative Total	7,754	
4	All pads surface soils with elevated metals (Ba,Cu,Pb,Zn > 1,500 mg/kg and PAH's above TAGM)	Pad A - Whole pad from 0 to 2 feet	2,240	2.0	166	PB-A-1
		Pad C - Whole pad from 0 to 2 feet	2,100	2.0	156	PB-C-1 thru 5
		Pad G - Hot spot around PBG-7	8,000	2.0	593	PB-G-7, GAE-G-2
		Pad J - Whole pad from 0 to 2 feet	60,000	2.0	4,444	PB-J-1 thru 10, GAE-J-1
		TOTAL			5,359	
				Cumulative Total	13,112	
5	All remaining surficial soils with Pb>500 mg/kg	Pad G - Hot spots around PBG-1 & PB-G-4	8,500	2.0	630	PB-G-1 & PB-G-4
		Pad E-Northern half of berm	3,600	2.0	267	BE-E-1 &BE-E-3
		Pad G - Northeastern tip of berm	800	4.0	119	BE-G-14
		Pad J - Hot spot in Western berm around BE-J-5	600	4.0	89	BE-J-5
		Pad A - Hot spot around GB-1(Northern end of Pad A))	400	2.0	30	GB-1
		Pad B - Hot spot around GB-24 (Southern end of Pad B))	2,400	2.0	178	GB-24
		Pad C - Hot spot around Pad C	21,200	2.0	1,570	GB-2,GB-23,GB-12, SD-200,SD-210,SD-220
		Pad D - Hot spot around GB-13 (NE end of Pad D)	1,600	2.0	119	GB-13
		Pad F - Hot spot around GB-15 (Southern end of Pad F))	2,500	2.0	185	GB-15
		Pad H - Hot spot around Northeastern end of Pad H	4,400	2.0	326	GB-19,GB-32,GB-34
	Surficial soils with high Ba & Zn	Pad J - Hot spot at the Northeastern end of Pad J	3,000	2.0	222	PB-J-8
		TOTAL			3,735	
	All subsurface soils with Pb>500 mg/kg	Pad D - Around PB-D-1 from 0 to 4 feet	2,000	4.0	296	PB-D-1
		Pad G - Around PB-G-1 from 2 to 4 feet	3,500	2.0	259	PB-G-1
		TOTAL			555	
				Cumulative Total	**17,402**	

TABLE 2-1

PAD A
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS AND PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD A 3.5' 12/03/91 BE-A-1-91	PAD A 2.0 feet 12/04/92 BE-A-3	PAD A 0-6" 12/16/91 PB-A-1	PAD-A 0-6" 12/16/91 PB-A-1A	PAD-A 0-2' 12/16/91 PB-A-2	PAD-A 0-2' 12/16/91 PB-A-2A	PAD-A 0-2' 12/16/91 PB-A-2ARE
VOCs (ug/kg)											
Methylene Chloride	0.0%	0	100	0	6 U	12 U	5 U	6 U	6 U	7 U J	7 U J
Acetone	0.0%	0	200	0	11 U	12 U	11 U	11 U	13 U	13 U J	13 U J
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U	12 U	5 U	6 U	6 U	7 U J	7 U J
Chloroform	0.0%	0	300	0	6 U	12 U	5 U	6 U	6 U	7 U J	7 U J
2-Butanone	0.0%	0	300	0	11 U	12 U	11 U	11 U	13 U	13 U J	13 U J
1,1,1-Trichloroethane	0.0%	0	800	0	6 U	12 U	5 U	6 U	6 U	7 U J	7 U J
Carbon Tetrachloride	0.0%	0	600	0	6 U	12 U	5 U	6 U	6 U	7 U J	7 U J
Trichloroethene	0.0%	0	700	0	6 U	12 U	5 U	6 U	6 U	7 U J	7 U J
Benzene	0.0%	0	60	0	6 U	12 U	5 U	6 U	6 U	7 U J	7 U J
Tetrachloroethene	0.0%	0	1400	0	6 U	12 U	5 U	6 U	6 U	7 U J	7 U J
Toluene	14.3%	2	1500	0	6 U	12 U	5 U	2 J	6 U	7 U J	7 U J
Chlorobenzene	14.3%	2	1700	0	6 U	12 U	5 U	4 J	6 U	7 U J	7 U J
Xylene (total)	0.0%	0	1200	0	6 U	12 U	5 U	6 U	6 U	7 U J	7 U J
Semivolatiles (ug/kg)											
Phenol	0.0%	0	30 or MDL	0	740 U	410 U	730 U	710 U	720 U	750 U	N
2-Methylphenol	0.0%	0	100 or MDL	0	740 U	410 U	730 U	710 U	720 U	750 U	N
4-Methylphenol	0.0%	0	900	0	740 U	410 U	730 U	710 U	720 U	750 U	N
2,4-Dimethylphenol	0.0%	0	50,000*	0	740 U	410 U	730 U	710 U	720 U	750 U	N
Benzoic acid	0.0%	0	2700	0	3600 U	N	3500 U	3400 U	3500 U	3600 U	N
Naphthalene	0.0%	0	13,000	0	740 U	410 U	730 U	710 U	720 U	750 U	N
2-Methylnaphthalene	66.7%	100	36,400	0	740 U	410 U	88 J	87 J	67 J	100 J	N
2-Chloronaphthalene	0.0%	0	50,000*	0	740 U	410 U	730 U	710 U	720 U	750 U	N
2-Nitroaniline	0.0%	0	430 or MDL	0	3600 U	990 U	3500 U	3400 U	3500 U	3600 U	N
Acenaphthylene	0.0%	0	41,000	0	740 U	410 U	730 U	710 U	720 U	750 U	N
2,6-Dinitrotoluene	0.0%	0	1000	0	740 U	410 U	730 U	710 U	720 U	750 U	N
3-Nitroaniline	0.0%	0	500 or MDL	0	3600 U	990 U	3500 U	3400 U	3500 U	3600 U	N
Acenaphthene	0.0%	0	50,000*	0	740 U	410 U	730 U	710 U	720 U	750 U	N
Dibenzofuran	0.0%	0	6200	0	740 U	410 U	730 U	710 U	720 U	750 U	N
2,4-Dinitrotoluene	66.7%	1500	50,000*	0	740 U	410 U	470 J	310 J	860 J	1500 J	N
Diethylphthalate	16.7%	250	7100	0	740 U	410 U	730 U	250 J	720 U	750 U	N
Fluorene	0.0%	0	50,000*	0	740 U	410 U	730 U	710 U	720 U	750 U	N
N-Nitrosodiphenylamine	0.0%	0	50,000*	0	740 U	410 U	730 U	710 U	720 U	750 U	N
Hexachlorobenzene	0.0%	0	410	0	740 U	410 U	730 U	710 U	720 U	750 U	N
Pentachlorophenol	0.0%	0	1000 or MDL	0	3600 U	990 U	3500 U	3400 U	3500 U	3600 U	N
Phenanthrene	66.7%	80	50,000*	0	740 U	410 U	79 J	73 J	78 J	80 J	N
Anthracene	0.0%	0	50,000*	0	740 U	410 U	730 U	710 U	720 U	750 U	N
Carbazole	0.0%	0	50,000*	0	N	410 U	N	N	N	N	N
Di-n-butylphthalate	16.7%	160	8100	0	740 U	410 U	730 U	160 J	720 U	750 U	N
Fluoranthene	16.7%	100	50,000*	0	740 U	410 U	730 U	100 J	720 U	750 U	N
Pyrene	16.7%	86	50,000*	0	740 U	410 U	730 U	86 J	720 U	750 U	N
Butylbenzylphthalate	16.7%	140	50,000*	0	740 U	410 U	730 U	140 J	720 U	750 U	N
Benzo(a)anthracene	16.7%	120	220 or MDL	0	740 U	410 U	730 U	120 J	720 U	750 U	N
Chrysene	16.7%	120	400	0	740 U	410 U	730 U	120 J	720 U	750 U	N
bis(2-Ethylhexyl)phthalate	16.7%	190	50,000*	0	740 U	410 U	730 U	190 J	720 U	750 U	N
Di-n-octylphthalate	16.7%	140	50,000*	0	740 U	410 U	730 U	140 J	720 U	750 U	N
Benzo(b)fluoranthene	16.7%	130	1100	0	740 U	410 U	730 U	130 J	720 U	750 U	N
benzo(k)fluoranthene	16.7%	120	1100	0	740 U	410 U	730 U	120 J	720 U	750 U	N
Benzo(a)pyrene	16.7%	120	61 or MDL	1	740 U	410 U	730 U	120 J	720 U	750 U	N
Indeno(1,2,3-cd)pyrene	16.7%	87	3200	0	740 U	410 U	730 U	87 J	720 U	750 U	N
Dibenz(a,h)anthracene	16.7%	74	14 or MDL	1	740 U	410 U	730 U	74 J	720 U	750 U	N
Benzo(g,h,i)perylene	16.7%	86	50,000*	0	740 U	410 U	730 U	86 J	720 U	750 U	N

TABLE 2-1

PAD A
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS AND PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD A 3.5' 12/03/91 BE-A-1-91	PAD A 2.0 feet 12/04/92 BE-A-3	PAD A 0-6" 12/16/91 PB-A-1	PAD-A 0-6" 12/16/91 PB-A-1A	PAD-A 0-2' 12/16/91 PB-A-2	PAD-A 0-2' 12/16/91 PB-A-2A	PAD-A 0-2' 12/16/91 PB-A-2ARE
Pesticides/PCBs (ug/kg)											
beta-BHC	0.0%	0	200	0	18 U	2.1 U	88 U	52 U	17 U	18 U	N
delta-BHC	0.0%	0	300	0	18 U	2.1 U	88 U	52 U	17 U	18 U	N
gamma-BHC (Lindane)	0.0%	0	60	0	18 U	2.1 U	88 U	52 U	17 U	18 U	N
Heptachlor	0.0%	0	100	0	18 U	2.1 U	88 U	52 U	17 U	18 U	N
Aldrin	0.0%	0	41	0	18 U	2.1 U	88 U	52 U	17 U	18 U	N
Heptachlor epoxide	0.0%	0	20	0	18 U	2.1 U	88 U	52 U	17 U	18 U	N
Endosulfan I	0.0%	0	900	0	18 U	2.1 U	88 U	52 U	17 U	18 U	N
Dieldrin	0.0%	0	44	0	36 U	4 U	180 U	100 U	35 U	36 U	N
4,4'-DDE	83.3%	140	2100	0	36 U	14	140 J	100 J	21 J	28 J	N
Endrin	0.0%	0	100	0	36 U	4 U	180 U	100 U	35 U	36 U	N
Endosulfan II	0.0%	0	900	0	36 U	4 U	180 U	100 U	35 U	36 U	N
4,4'-DDD	0.0%	0	2900	0	36 U	4 U	180 U	100 U	35 U	36 U	N
Endosulfan sulfate	0.0%	0	1000	0	36 U	4 U	180 U	100 U	35 U	36 U	N
4,4'-DDT	16.7%	9	2100	0	36 U	9	180 U	100 U	35 U	36 U	N
Endrin aldehyde	0.0%	0		NA	N	4 U	N	N	N	N	N
alpha-Chlordane	0.0%	0	540	0	180 U	2.1 U	880 U	520 U	170 U	180 U	N
Aroclor-1254	0.0%	0	1000	0	360 U	40 U	1800 U	1000 U	350 U	360 U	N
Aroclor-1260	0.0%	0	1000	0	360 U	40 U	1800 U	1000 U	350 U	360 U	N
Explosives (ug/kg)											
HMX	0.0%	0		NA	1000 U	120 U	1000 U	1000 U	1000 U	1000 U	N
RDX	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	N
1,3,5-Trinitrobenzene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	N
1,3-Dinitrobenzene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	N
Tetryl	0.0%	0		NA	400 U	120 U	400 U	400 U	400 U	400 U	N
2,4,6-Trinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	N
4-amino-2,6-Dinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	N
2-amino-4,6-Dinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	N
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	120 U	120 U	120 U	120 U	N
2,4-Dinitrotoluene	100.0%	1600		NA	140	120 J	1400	1500	1600	600	N
Metals (mg/kg)											
Aluminum	100.0%	19000	17503.0	2	18300	19000	14800	15000	15800	13300	N
Antimony	66.7%	18.7	5	4	14.5 R	11.2 R	15.3	5.7 J	18.7	13.5	N
Arsenic	83.3%	10.3	7.5	1	5 R	4.5 J	4	4.4	10.3	7.1	N
Barium	100.0%	1910	300	6	1040	607	1290	1910	1540	1820	N
Beryllium	16.7%	0.77	1	1	0.85 R	0.77	0.72 R	0.74 R	0.6 R	0.54 R	N
Cadmium	100.0%	9.6	1.8	5	3.9 J	0.74	3.3	2.6	9.6	5.9	N
Calcium	100.0%	37200	46825.0	0	8210	10900	37200	30500	36200	17700	N
Chromium	83.3%	46.4	26.6	3	24.5 R	27	26.1	25.9	46.4	35.9	N
Cobalt	100.0%	17.6	30	0	17.6	10.6	15.3	13.5	15.5	11.2	N
Copper	100.0%	3160	25	6	767	504	962	1660	3160	2090	N
Iron	100.0%	49700	32698.0	3	28200	29400	41300	28300	49700	43900	N
Lead	100.0%	7880	30	6	7880 J	1380	1980	1560	2530	1220	N
Magnesium	100.0%	9370	9071.1	1	7030	5740	8450	8480	9370	8760	N
Manganese	100.0%	1620	1065.8	2	1260	381	447	417	1620 J	502 J	N
Mercury	66.7%	0.13	0.1	1	0.04 UJ	0.09 J	0.13 J	0.04 J	0.04 U	0.05 J	N
Nickel	100.0%	57.7	41.3	4	31.5	32.9	57.7	46.4	53.2	42.3	N
Potassium	100.0%	3160	1529.6	4	1740 J	1950	1280	1450	3160	1810	N
Selenium	50.0%	0.79	2	0	0.21 UJ	0.79 J	0.52 U	0.53 U	0.19 J	0.21 J	N
Silver	0.0%	0	0.6	0	0.38 R	0.37 U	0.99 U	0.87 U	0.86 U	0.94 U	N
Sodium	83.3%	331	76	3	66.6 J	94 R	64.4 J	63.4 J	331 J	141 J	N
Thallium	0.0%	0	0.3	0	0.67 U	0.45 U	0.33 U	0.34 U	0.34 U	0.36 U	N
Vanadium	100.0%	29.1	150	0	28.8	29.1	16.2	18.6	21.9	16.7	N
Zinc	100.0%	2150	89.1	6	210	426	222	350	2150	926	N
Cyanide	0.0%	0	NA	NA	0.65 U	0.62 U	0.49 U	0.64 U	0.58 U	0.62 U	N

NOTES:

a) * = As per proposed TAGM, Total VOCs <10 ppm, Total Semi-VOCs <500 ppm, Individual Semi-VOCs <50 ppm.
For certain metals, the TAGM is equal to the greater value between the proposed TAGM and site background.
The number of samples above the TAGM was determined by comparison to the actual number given, not the MDL.
b) The TAGM for 1,2-Dichloroethene (trans) was used for 1,2-Dichloroethene (total) since it was the only value available
c) NA = not applicable
d) N = Compound was not analyzed.
e) U = Compound was not detected.
f) J = The reported value is an estimated concentration.
g) R = The data was rejected in the data validation process.
h) SB = Site background
i) MDL = Method detection limit

TABLE 2-2

PAD B
SUMMARY OF COMPOUNDS DETECTED IN PAD B
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD B 2.5' 12/10/91 BE-B-2-91	OB 2.0 feet 12/03/92 BE-B-3	OB 2.0 feet 12/03/92 BE-B-4	PAD-B 0-6" 12/11/91 PB-B-1-1	PAD-B 0-6" 12/11/91 PB-B-1-1RE	PAD-B 6-8' 12/11/91 PBB-1-5	PAD-B 6-8' 12/11/91 PBB-1-5RE
VOCs (ug/kg)											
Methylene Chloride	0.0%	0	100	0	6 U	12 U	N	6 U J	5 U J	6 U J	6 U J
Acetone	0.0%	0	200	0	12 U	12 U	N	11 U J	10 U J	11 U J	11 U J
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U	12 U	N	6 U J	5 U J	6 U J	6 U J
Chloroform	0.0%	0	300	0	6 U	12 U	N	6 U J	5 U J	6 U J	6 U J
2-Butanone	0.0%	0	300	0	12 U	12 U	N	11 U J	10 U J	11 U J	11 U J
1,1,1-Trichloroethane	0.0%	0	800	0	6 U	12 U	N	6 U J	5 U J	6 U J	6 U J
Carbon Tetrachloride	0.0%	0	600	0	6 U	12 U	N	6 U J	5 U J	6 U J	6 U J
Trichloroethene	0.0%	0	700	0	6 U	12 U	N	6 U J	5 U J	6 U J	6 U J
Benzene	0.0%	0	60	0	6 U	12 U	N	6 U J	5 U J	6 U J	6 U J
Tetrachloroethene	0.0%	0	1400	0	6 U	12 U	N	6 U J	5 U J	6 U J	6 U J
Toluene	16.7%	3	1500	0	6 U	12 U	N	6 U J	5 U J	6 U J	3 J
Chlorobenzene	0.0%	0	1700	0	6 U	12 U	N	6 U J	5 U J	6 U J	6 U J
Xylene (total)	0.0%	0	1200	0	6 U	12 U	N	6 U J	5 U J	6 U J	6 U J
Semivolatiles (ug/kg)											
Phenol	0.0%	0	30 or MDL	0	770 U	420 U	N	960 U	N	740 U	N
2-Methylphenol	0.0%	0	100 or MDL	0	770 U	420 U	N	960 U	N	740 U	N
4-Methylphenol	0.0%	0	900	0	770 U	420 U	N	960 U	N	740 U	N
2,4-Dimethylphenol	0.0%	0	50,000*	0	770 U	420 U	N	960 U	N	740 U	N
Benzoic acid	0.0%	0	2700	0	3800 U	N	N	4700 U	N	3600 U	N
Naphthalene	25.0%	160	13,000	0	770 U	420 U	N	160 J	N	740 U	N
2-Methylnaphthalene	25.0%	15	36,400	0	770 U	15 J	N	960 U	N	740 U	N
2-Chloronaphthalene	25.0%	130	50,000*	0	770 U	420 U	N	130 J	N	740 U	N
2-Nitroaniline	0.0%	0	430 or MDL	0	3800 U	1000 U	N	4700 U	N	3600 U	N
Acenaphthylene	0.0%	0	41,000	0	770 U	420 U	N	960 U	N	740 U	N
2,6-Dinitrotoluene	25.0%	470	1000	0	770 U	470	N	960 U	N	740 U	N
3-Nitroaniline	0.0%	0	500 or MDL	0	3800 U	1000 U	N	4700 U	N	3600 U	N
Acenaphthene	0.0%	0	50,000*	0	770 U	420 U	N	960 U	N	740 U	N
Dibenzofuran	0.0%	0	6200	0	770 U	420 U	N	960 U	N	740 U	N
2,4-Dinitrotoluene	50.0%	5600	50,000*	0	130 J	5600 J	N	960 U	N	740 U	N
Diethylphthalate	0.0%	0	7100	0	770 U	420 U	N	960 U	N	740 U	N
Fluorene	0.0%	0	50,000*	0	770 U	420 U	N	960 U	N	740 U	N
N-Nitrosodiphenylamine	25.0%	240	50,000*	0	770 U	240 J	N	960 U	N	740 U	N
Hexachlorobenzene	25.0%	20	410	0	770 U	20 J	N	960 U	N	740 U	N
Pentachlorophenol	0.0%	0	1000 or MDL	0	3800 U	1000 U	N	4700 U	N	3600 U	N
Phenanthrene	25.0%	25	50,000*	0	770 U	25 J	N	960 U	N	740 U	N
Anthracene	0.0%	0	50,000*	0	770 U	420 U	N	960 U	N	740 U	N
Carbazole	0.0%	0	50,000*	0	N	420 U	N	N	N	N	N
Di-n-butylphthalate	50.0%	790	8100	0	380 J	790	N	960 U	N	740 U	N
Fluoranthene	0.0%	0	50,000*	0	770 U	420 U	N	960 U	N	740 U	N
Pyrene	0.0%	0	50,000*	0	770 U	420 U	N	960 U	N	740 U	N
Butylbenzylphthalate	0.0%	0	50,000*	0	770 U	420 U	N	960 U	N	740 U	N
Benzo(a)anthracene	0.0%	0	220 or MDL	0	770 U	420 U	N	960 U	N	740 U	N
Chrysene	0.0%	0	400	0	770 U	420 U	N	960 U	N	740 U	N
bis(2-Ethylhexyl)phthalate	50.0%	300	50,000*	0	170 J	300 J	N	960 U	N	740 U	N
Di-n-octylphthalate	0.0%	0	50,000*	0	770 U	420 U	N	960 U	N	740 U	N
Benzo(b)fluoranthene	0.0%	0	1100	0	770 U	420 U	N	960 U	N	740 U	N
benzo(k)fluoranthene	0.0%	0	1100	0	770 U	420 U	N	960 U	N	740 U	N
Benzo(a)pyrene	0.0%	0	61 or MDL	0	770 U	420 U	N	960 U	N	740 U	N
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	770 U	420 U	N	960 U	N	740 U	N
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	770 U	420 U	N	960 U	N	740 U	N
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	770 U	420 U	N	960 U	N	740 U	N

TABLE 2-2

PAD B
SUMMARY OF COMPOUNDS DETECTED IN PAD B
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD B 2.5' 12/10/91 BE-B-2-91	OB 2.0 feet 12/03/92 BE-B-3	OB 2.0 feet 12/03/92 BE-B-4	PAD-B 0-6" 12/11/91 PB-B-1-1	PAD-B 0-6" 12/11/91 PB-B-1-1RE	PAD-B 6-8' 12/11/91 PBB-1-5	PAD-B 6-8' 12/11/91 PBB-1-5RE
Pesticides/PCBs (ug/kg)											
beta-BHC	0.0%	0	200	0	190 U	2.2 U	N	180 U	N	18 U	N
delta-BHC	0.0%	0	300	0	190 U	2.2 U	N	180 U	N	18 U	N
gamma-BHC (Lindane)	0.0%	0	60	0	190 U	2.2 U	N	180 U	N	18 U	N
Heptachlor	0.0%	0	100	0	190 U	2.2 U	N	180 U	N	18 U	N
Aldrin	0.0%	0	41	0	190 U	2.2 U	N	180 U	N	18 U	N
Heptachlor epoxide	0.0%	0	20	0	190 U	2.2 U	N	180 U	N	18 U	N
Endosulfan I	0.0%	0	900	0	190 U	2.2 U	N	180 U	N	18 U	N
Dieldrin	0.0%	0	44	0	380 U	4.2 U	N	350 U	N	36 U	N
4,4'-DDE	25.0%	6.2	2100	0	380 U	6.2	N	350 U	N	36 U	N
Endrin	0.0%	0	100	0	380 U	4.2 U	N	350 U	N	36 U	N
Endosulfan II	0.0%	0	900	0	380 U	4.2 U	N	350 U	N	36 U	N
4,4'-DDD	0.0%	0	2900	0	380 U	4.2 U	N	350 U	N	36 U	N
Endosulfan sulfate	0.0%	0	1000	0	380 U	4.2 U	N	350 U	N	36 U	N
4,4'-DDT	50.0%	2800	2100	1	2800	11	N	350 U	N	36 U	N
Endrin aldehyde	0.0%	0		NA	N	4.2 U	N	N	N	N	N
alpha-Chlordane	0.0%	0	540	0	1900 U	2.2 U	N	1800 U	N	180 U	N
Aroclor-1254	0.0%	0	1000	0	3800 U	42 U	N	3500 U	N	360 U	N
Aroclor-1260	0.0%	0	1000	0	3800 U	42 U	N	3500 U	N	360 U	N
Explosives (ug/kg)											
HMX	0.0%	0		NA	1000 U	120 U	N	1000 U	N	1000 U	N
RDX	0.0%	0		NA	120 U	120 U	N	120 U	N	120 U	N
1,3,5-Trinitrobenzene	50.0%	250		NA	250	120 J	N	120 U	N	120 U	N
1,3-Dinitrobenzene	0.0%	0		NA	120 U	120 U	N	120 U	N	120 U	N
Tetryl	0.0%	0		NA	400 U	120 U	N	400 U	N	400 U	N
2,4,6-Trinitrotoluene	50.0%	430		NA	300	430	N	120 U	N	120 U	N
4-amino-2,6-Dinitrotoluene	25.0%	200		NA	120 U	200 J	N	120 U	N	120 U	N
2-amino-4,6-Dinitrotoluene	50.0%	360		NA	360	170	N	120 U	N	120 U	N
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	N	120 U	N	120 U	N
2,4-Dinitrotoluene	50.0%	590		NA	590	530	N	120 U	N	120 U	N
Metals (mg/kg)											
Aluminum	100.0%	23900	17503.0	2	19400	N	23900	15700	N	16600	N
Antimony	0.0%	0	5	0	68.8 R	N	17.7 R	9.9 UR	N	17.8 R	N
Arsenic	75.0%	8	7.5	2	10.1 R	N	7.7 J	8 J	N	5.6 J	N
Barium	100.0%	19600	300	4	19600	N	2510	14700 J	N	6040 J	N
Beryllium	25.0%	0.96	1	0	0.77 R	N	0.96	0.74 R	N	0.67 R	N
Cadmium	100.0%	15	1.8	4	15 J	N	5.5	9.5	N	5	N
Calcium	100.0%	33400	46825.0	0	11700	N	7030	24300 J	N	33400 J	N
Chromium	75.0%	47.7	26.6	3	48.1 R	N	41.6	47.7	N	27	N
Cobalt	100.0%	19.5	30	0	19.5	N	14.6	15.5	N	11.6	N
Copper	100.0%	38100	25	4	38100	N	3050	1150 J	N	6890 J	N
Iron	100.0%	48100	32698.0	4	43200	N	37200	48100 J	N	39100 J	N
Lead	100.0%	41200	30	4	41200 J	N	7210	231 J	N	3180 J	N
Magnesium	100.0%	13400	9071.1	2	9210	N	8390	7010	N	13400	N
Manganese	100.0%	693	1065.8	0	646	N	518	693	N	420	N
Mercury	100.0%	0.2	0.1	2	0.2 J	N	0.15	0.07 J	N	0.08	N
Nickel	100.0%	64.8	41.3	4	44.8	N	46.3	64.8	N	42.8	N
Potassium	100.0%	3570	1529.6	4	3570 J	N	3060	3150	N	1850	N
Selenium	100.0%	3.2	2	2	3.2 J	N	3 J	0.32 J	N	0.2 J	N
Silver	50.0%	2.3	0.6	2	3.1 R	N	0.74 J	2.3	N	0.95 U	N
Sodium	75.0%	347	76	3	347 J	N	158 R	337 J	N	149 J	N
Thallium	0.0%	0	0.3	0	0.34 U	N	0.51 U	0.4 U	N	0.31 U	N
Vanadium	100.0%	36.2	150	0	29.2	N	36	36.2	N	21.6	N
Zinc	100.0%	5380	89.1	4	5380	N	2070	2610 J	N	712 J	N
Cyanide	25.0%	0.52	NA	NA	0.67 U	N	0.59 U	0.61 U	N	0.52	N

NOTES:
a) * = As per proposed TAGM. Total VOCs <10ppm. Total Semi-VOCs <500 ppm. Individual Semi-VOCs <50ppm
For certain metals, the TAGM is equal to the greater value between the proposed TAGM and site background.
The number of samples above the TAGM was determined by comparison to the actual number given, not the MDL.
b) The TAGM for 1,2-Dichloroethene (trans) was used for 1,2-Dichloroethene (total) since it was the only value available.
c) NA = not applicable
d) N = Compound was not analyzed.
e) U = Compound was not detected.
f) J = The reported value is an estimated concentration.
g) R = The data was rejected in the data validation process.
h) SB = Site background
i) MDL = Method detection limit

TABLE 2-3

PAD C
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD C 4.0' 12/03/91 BE-C-2-91	PAD C 4.0' 12/03/91 BE-C-3-91	OB 2.0 feet 12/03/92 BE-C-5	OB 2.0 feet 12/03/92 BE-C-5RE	OB 2.0 feet 12/03/92 BE-C-6	PAD C 0-6" 01/07/92 PBC-1-1	PAD C 0-6" 01/07/92 PBC-1-1A	PAD C 0-6" 01/07/92 PBC-1-1ARE	PAD C 2-4' 01/07/92 PBC-1-3	PAD C 2-4' 01/07/92 PBC-1-3DL
VOCs(ug/kg)														
Methylene Chloride	6.3%	21	100	0	6 U	6 U	12 U	N	N	8 U J	6 U J	5 U J	6 U R	28 U
Acetone	0.0%	0	200	0	11 U	12 U	12 U	N	N	11 U J	11 U J	11 U J	11 U R	56 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U	6 U	12 U	N	N	5 U J	6 U J	5 U J	6 U R	28 U
Chloroform	6.3%	7	300	0	6 U	6 U	12 U	N	N	5 U J	6 U J	5 U J	6 U R	28 U
2-Butanone	0.0%	0	300	0	11 U	12 U	12 U	N	N	11 U J	11 U J	11 U J	11 U R	56 U
1,1,1-Trichloroethane	0.0%	0	800	0	6 U	6 U	12 U	N	N	5 U J	6 U J	5 U J	6 U R	28 U
Carbon Tetrachloride	0.0%	0	600	0	6 U	6 U	12 U	N	N	5 U J	6 U J	5 U J	6 U R	28 U
Trichloroethene	6.3%	4	700	0	6 U	6 U	4 J	N	N	5 U J	6 U J	5 U J	6 U R	28 U
Benzene	6.3%	2	60	0	6 U	6 U	12 U	N	N	5 U J	6 U J	5 U J	6 U R	28 U
Tetrachloroethene	12.5%	6	1400	0	6	1 J	12 U	N	N	5 U J	6 U J	5 U J	6 U R	28 U
Toluene	6.3%	2	1500	0	6 U	6 U	12 U	N	N	5 U J	6 U J	5 U J	6 U R	28 U
Chlorobenzene	0.0%	0	1700	0	6 U	6 U	12 U	N	N	5 U J	6 U J	5 U J	6 U R	28 U
Xylene (total)	0.0%	0	1200	0	6 U	6 U	12 U	N	N	5 U J	6 U J	5 U J	6 U R	28 U
Semivolatiles (ug/kg)														
Phenol	16.7%	360	30 or MDL	2	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
2-Methylphenol	16.7%	760	100 or MDL	2	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
4-Methylphenol	16.7%	1300	900	2	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
2,4-Dimethylphenol	16.7%	630	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Benzoic acid	0.0%	0	2700	0	3700 U	3900 U	N	N	N	3400 U	3400 U	N	N	N
Naphthalene	41.7%	84	13,000	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
2-Methylnaphthalene	58.3%	360	36,400	0	750 U	800 U	15 J	N	N	710 U	710 U	N	N	N
2-Chloronaphthalene	8.3%	18	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
2-Nitroaniline	0.0%	0	430 or MDL	0	3700 U	3900 U	980 U	N	N	3400 U	3400 U	N	N	N
Acenaphthylene	0.0%	0	41,000	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
2,6-Dinitrotoluene	8.3%	250	1000	0	750 U	800 U	250 J	N	N	710 U	710 U	N	N	N
3-Nitroaniline	0.0%	0	500 or MDL	0	3700 U	3900 U	980 U	N	N	3400 U	3400 U	N	N	N
Acenaphthene	0.0%	0	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Dibenzofuran	0.0%	0	6200	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
2,4-Dinitrotoluene	25.0%	2900	50,000*	0	750 U	730 J	2900 J	N	N	710 U	710 U	N	N	N
Diethylphthalate	0.0%	0	7100	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Fluorene	0.0%	0	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
N-Nitrosodiphenylamine	33.3%	1100	50,000*	0	750 U	190 J	360 J	N	N	710 U	710 U	N	N	N
Hexachlorobenzene	0.0%	0	410	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Pentachlorophenol	0.0%	0	1000 or MDL	0	3700 U	3900 U	980 U	N	N	3400 U	3400 U	N	N	N
Phenanthrene	50.0%	540	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Anthracene	0.0%	0	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Carbazole	0.0%	0	50,000*	0	N	N	400 U	N	N	N	N	N	N	N
Di-n-butylphthalate	25.0%	740	8100	0	740 J	200 J	720	N	N	710 U	710 U	N	N	N
Fluoranthene	16.7%	20	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Pyrene	25.0%	120	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Butylbenzylphthalate	0.0%	0	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Benzo(a)anthracene	16.7%	77	220 or MDL	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Chrysene	16.7%	180	400	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
bis(2-Ethylhexyl)phthalate	50.0%	750	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Di-n-octylphthalate	0.0%	0	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Benzo(b)fluoranthene	16.7%	79	1100	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
benzo(k)fluoranthene	0.0%	0	1100	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Benzo(a)pyrene	16.7%	160	61 or MDL	2	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Indeno(1,2,3-cd)pyrene	16.7%	63	3200	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N
Benzo(g,h,i)perylene	16.7%	320	50,000*	0	750 U	800 U	400 U	N	N	710 U	710 U	N	N	N

TABLE 2-3

PAD C
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD C 4.0' 12/03/91 BE-C-2-91	PAD C 4.0' 12/03/91 BE-C-3-91	OB 2.0 feet 12/03/92 BE-C-5	OB 2.0 feet 12/03/92 BE-C-5RE	OB 2.0 feet 12/03/92 BE-C-6	PAD C 0-6" 01/07/92 PBC-1-1	PAD C 0-6" 01/07/92 PBC-1-1A	PAD C 0-6" 01/07/92 PBC-1-1ARE	PAD C 2-4' 01/07/92 PBC-1-3	PAD C 2-4' 01/07/92 PBC-1-3DL
Pesticides/PCBs (ug/kg)														
beta-BHC	0.0%	0	200	0	18 U	19 U	2.1 U	2.1 U	N	17 U	17 U	N	N	N
delta-BHC	0.0%	0	300	0	18 U	19 U	2.1 U	2.1 U	N	17 U	17 U	N	N	N
gamma-BHC (Lindane)	7.7%	9.6	60	0	18 U	19 U	2.1 U	2.1 U	N	17 U	17 U	N	N	N
Heptachlor	7.7%	32	100	0	18 U	19 U	2.1 U	2.1 U	N	17 U	17 U	N	N	N
Aldrin	23.1%	4	41	0	18 U	19 U	2.1 U	2.1 U	N	17 U	17 U	N	N	N
Heptachlor epoxide	0.0%	0	20	0	18 U	19 U	2.1 U	2.1 U	N	17 U	17 U	N	N	N
Endosulfan I	15.4%	2.6	900	0	18 U	19 U	2.1 U	2.1 U	N	17 U	17 U	N	N	N
Dieldrin	0.0%	0	44	0	37 U	39 U	4.1 U	4.1 U	N	34 U	34 U	N	N	N
4,4'-DDE	15.4%	1.3	2100	0	37 U	39 U	1.3 J	1.2 J	N	34 U	34 U	N	N	N
Endrin	0.0%	0	100	0	37 U	39 U	4.1 U	4.1 U	N	34 U	34 U	N	N	N
Endosulfan II	15.4%	110	900	0	37 U	39 U	4.1 U	4.1 U	N	34 U	34 U	N	N	N
4,4'-DDD	15.4%	3.7	2900	0	37 U	39 U	4.1 U	4.1 U	N	34 U	34 U	N	N	N
Endosulfan sulfate	15.4%	4.3	1000	0	37 U	39 U	4.1 U	4.1 U	N	34 U	34 U	N	N	N
4,4'-DDT	23.1%	2.6	2100	0	37 U	39 U	2.2 J	2.6 J	N	34 U	34 U	N	N	N
Endrin aldehyde	14.3%	4.5		NA	N	N	4.1 U	4.1 U	N	N	N	N	N	N
alpha-Chlordane	23.1%	270	540	0	180 U	190 U	2.1 U	2.1 U	N	170 U	170 U	N	N	N
Aroclor-1254	0.0%	0	1000	0	370 U	390 U	41 U	41 U	N	340 U	340 U	N	N	N
Aroclor-1260	0.0%	0	1000	0	370 U	390 U	41 U	41 U	N	340 U	340 U	N	N	N
Explosives (ug/kg)														
HMX	0.0%	0		NA	1000 U	1000 U	120 U	N	N	1000 U	1000 U	N	N	N
RDX	8.3%	88		NA	120 U	120 U	120 U	N	N	120 U	120 U	N	N	N
1,3,5-Trinitrobenzene	33.3%	610		NA	610	180	140	N	N	120 U	120 U	N	N	N
1,3-Dinitrobenzene	0.0%	0		NA	120 U	120 U	120 U	N	N	120 U	120 U	N	N	N
Tetryl	0.0%	0		NA	400 U	400 U	120 U	N	N	400 U	400 U	N	N	N
2,4,6-Trinitrotoluene	16.7%	240		NA	120 U	240	160 J	N	N	120 U	120 U	N	N	N
4-amino-2,6-Dinitrotoluene	16.7%	240		NA	120 U	240	240 J	N	N	120 U	120 U	N	N	N
2-amino-4,6-Dinitrotoluene	8.3%	240		NA	120 U	120 U	240 J	N	N	120 U	120 U	N	N	N
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	120 U	N	N	120 U	120 U	N	N	N
2,4-Dinitrotoluene	58.3%	1000		NA	440	460	1000 J	N	N	120 U	120 U	N	N	N
Metals (mg/kg)														
Aluminum	100.0%	30500	17503.0	2	20700	30500	N	N	16800	13100	15100	N	N	N
Antimony	33.3%	143	5	3	6.1 R	67.7 R	N	N	17.7 R	4.9 UJ	5.2 UJ	N	N	N
Arsenic	91.7%	20	7.5	1	6.2 R	20	N	N	6.4 J	6.1 J	5.3 J	N	N	N
Barium	100.0%	3900	300	7	2240	3900	N	N	1360	102	166	N	N	N
Beryllium	50.0%	0.83	1	0	0.79 R	0.86 R	N	N	0.83	0.68 R	0.77 R	N	N	N
Cadmium	100.0%	28.2	1.8	10	28.2	16.3 J	N	N	1.7	4.5	3.6	N	N	N
Calcium	100.0%	31100	46825.0	0	15200	12300	N	N	11300	22400	27800	N	N	N
Chromium	83.3%	32.1	26.6	7	53.6 R	46 R	N	N	27.4	26 J	28.2 J	N	N	N
Cobalt	100.0%	14.4	30	0	13.8	11.4	N	N	11.9	12.7	13.8	N	N	N
Copper	100.0%	13000	25	12	3800	3620	N	N	4860	93.7 J	1330 J	N	N	N
Iron	100.0%	42600	32698.0	5	36200	33800	N	N	27700	30400	36500	N	N	N
Lead	100.0%	56700	30	12	56700 J	29000 J	N	N	5730	373	146	N	N	N
Magnesium	100.0%	8770	9071.1	0	8060	8770	N	N	6650	6330	7700	N	N	N
Manganese	100.0%	676	1065.8	0	610	676	N	N	529	342	374	N	N	N
Mercury	41.7%	0.23	0.1	3	0.21 J	0.23 J	N	N	0.09	0.1 R	0.25 R	N	N	N
Nickel	100.0%	66.1	41.3	9	49.9	51.6	N	N	37.9	53 J	51.8 J	N	N	N
Potassium	100.0%	3060	1529.6	9	2880 J	3060 J	N	N	2240	1580 J	1930 J	N	N	N
Selenium	58.3%	0.79	2	0	1 UJ	0.86 UJ	N	N	0.74 J	0.45 J	0.4 J	N	N	N
Silver	66.7%	6.5	0.6	6	4.7	6.5	N	N	0.86 J	1.2	0.54 J	N	N	N
Sodium	83.3%	482	76	10	353 J	482 J	N	N	82.6 R	105 J	110 J	N	N	N
Thallium	16.7%	0.76	0.3	2	0.64 U	0.55 U	N	N	0.6 U	0.76 J	0.51 J	N	N	N
Vanadium	91.7%	31.8	150	0	22.9	31.8	N	N	27.5	19 R	20.6	N	N	N
Zinc	100.0%	127000	89.1	12	7640	3380	N	N	966	613	1540	N	N	N
Cyanide	0.0%	0	NA	NA	0.6 U	0.69 U	N	N	0.61 U	0.6 U	0.55 U	N	N	N

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TABLE 2-3

PAD C
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	NUMBER OF SAMPLES ABOVE SITE BACKGROUND	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD C 2-4' 01/07/92 PBC-1-3A	PAD C 2-4' 01/07/92 PBC-1-3ADL	PAD C 2-4' 01/07/92 PBC-1-4	PAD C 2-4' 01/07/92 PBC-1-4A	OB 0-2 03/11/93 PBC-2-1	OB 0-2 03/11/93 PBC-2-2	OB 0-2 03/11/93 PBC2-2RE	OB 0-2 03/11/93 PBC-3-1	OB 0-2 03/11/93 PBC-4-1	OB 0-2 03/11/93 PBC-5-1
VOCs(ug/kg)														
Methylene Chloride	6.3%	1	100	0	6 U J	950 U R	N	N	21	11 U	11 U	11 U	28 U	11 U
Acetone	0.0%	0	200	0	15 U J	1500 U R	N	N	11 U	11 U	11 U	11 U	28 U	11 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U J	740 U R	N	N	11 U	11 U	11 U	11 U	28 U	11 U
Chloroform	6.3%	0	300	0	6 U J	740 U R	N	N	11 U	11 U	11 U	11 U	7 J	11 U
2-Butanone	0.0%	0	300	0	12 U J	1500 U R	N	N	11 U	11 U	11 U	11 U	28 U	11 U
1,1,1-Trichloroethane	0.0%	0	800	0	6 U J	740 U R	N	N	11 U	11 U	11 U	11 U	28 U	11 U
Carbon Tetrachloride	0.0%	0	600	0	6 U J	740 U R	N	N	11 U	11 U	11 U	11 U	28 U	11 U
Trichloroethene	6.3%	0	700	0	6 U J	740 U R	N	N	11 U	11 U	11 U	11 U	28 U	11 U
Benzene	6.3%	0	60	0	2 J	180 R	N	N	11 U	11 U	11 U	11 U	28 U	11 U
Tetrachloroethene	12.5%	0	1400	0	6 U J	740 U R	N	N	11 U	11 U	11 U	11 U	28 U	11 U
Toluene	6.3%	0	1500	0	2 J	740 U R	N	N	11 U	11 U	11 U	11 U	28 U	11 U
Chlorobenzene	0.0%	0	1700	0	6 U J	740 U R	N	N	11 U	11 U	11 U	11 U	28 U	11 U
Xylene (total)	0.0%	0	1200	0	6 U J	740 U R	N	N	11 U	11 U	11 U	11 U	28 U	11 U
Semivolatiles (ug/kg)														
Phenol	16.7%	0	30 or MDL	2	N	N	360 J	360 J	360 U	360 U	N	350 U	1800 U	3600 U
2-Methylphenol	16.7%	2	100 or MDL	2	N	N	650 J	760	360 U	360 U	N	350 U	1800 U	3600 U
4-Methylphenol	16.7%	2	900	2	N	N	1100	1300	360 U	360 U	N	350 U	1800 U	3600 U
2,4-Dimethylphenol	16.7%	2	50,000*	0	N	N	120 J	630 J	360 U	360 U	N	350 U	1800 U	3600 U
Benzoic acid	0.0%	0	2700	0	N	N	3800 U	3600 U	N	N	N	N	N	N
Naphthalene	41.7%	0	13,000	0	N	N	84 J	80 J	55 J	59 J	N	20 J	1800 U	3600 U
2-Methylnaphthalene	58.3%	0	36,400	0	N	N	360 J	330 J	240 J	180 J	N	35 J	270 J	3600 U
2-Chloronaphthalene	8.3%	0	50,000*	0	N	N	780 U	750 U	360 U	360 U	N	18 J	1800 U	3600 U
2-Nitroaniline	0.0%	0	430 or MDL	0	N	N	3800 U	3600 U	870 U	880 U	N	850 U	4300 U	8700 U
Acenaphthylene	0.0%	0	41,000	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
2,6-Dinitrotoluene	8.3%	0	1000	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
3-Nitroaniline	0.0%	0	500 or MDL	0	N	N	3800 U	3600 U	870 U	880 U	N	850 U	4300 U	8700 U
Acenaphthene	0.0%	0	50,000*	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
Dibenzofuran	0.0%	0	6200	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
2,4-Dinitrotoluene	25.0%	2	50,000*	0	N	N	670 J	750 U	360 U	360 U	N	350 U	1800 U	3600 U
Diethylphthalate	0.0%	0	7100	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
Fluorene	0.0%	0	50,000*	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
N-Nitrosodiphenylamine	33.3%	2	50,000*	0	N	N	1100 J	510 J	360 U	360 U	N	350 U	1800 U	3600 U
Hexachlorobenzene	0.0%	0	410	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	N	N	3800 U	3600 U	870 U	880 U	N	850 U	4300 U	8700 U
Phenanthrene	50.0%	1	50,000*	0	N	N	220 J	200 J	100 J	88 J	N	22 J	540 J	3600 U
Anthracene	0.0%	0	50,000*	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
Carbazole	0.0%	0	50,000*	0	N	N	N	N	360 U	360 U	N	350 U	1800 U	3600 U
Di-n-butylphthalate	25.0%	2	8100	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
Fluoranthene	16.7%	0	50,000*	0	N	N	780 U	750 U	20 J	19 J	N	350 U	1800 U	3600 U
Pyrene	25.0%	0	50,000*	0	N	N	780 U	750 U	120 J	97 J	N	350 U	120 J	3600 U
Butylbenzylphthalate	0.0%	0	50,000*	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
Benzo(a)anthracene	16.7%	0	220 or MDL	0	N	N	780 U	750 U	77 J	56 J	N	350 U	1800 U	3600 U
Chrysene	16.7%	0	400	0	N	N	780 U	750 U	180 J	130 J	N	350 U	1800 U	3600 U
bis(2-Ethylhexyl)phthalate	50.0%	1	50,000*	0	N	N	290 J	240 J	260 J	290 J	N	350 U	750 J	410 J
Di-n-octylphthalate	0.0%	0	50,000*	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
Benzo(b)fluoranthene	16.7%	0	1100	0	N	N	780 U	750 U	79 J	55 J	N	350 U	1800 U	3600 U
benzo(k)fluoranthene	0.0%	0	1100	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
Benzo(a)pyrene	16.7%	0	61 or MDL	2	N	N	780 U	750 U	160 J	120 J	N	350 U	1800 U	3600 U
Indeno(1,2,3-cd)pyrene	16.7%	0	3200	0	N	N	780 U	750 U	63 J	46 J	N	350 U	1800 U	3600 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	N	N	780 U	750 U	360 U	360 U	N	350 U	1800 U	3600 U
Benzo(g,h,i)perylene	16.7%	0	50,000*	0	N	N	780 U	750 U	350 J	320 J	N	350 U	1800 U	3600 U

TABLE 2-3

PAD C
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	NUMBER OF SAMPLES ABOVE SITE BACKGROUND	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD C 2-4' 01/07/92 PBC-1-3A	PAD C 2-4' 01/07/92 PBC-1-3ADL	PAD C 2-4' 01/07/92 PBC-1-4	PAD C 2-4' 01/07/92 PBC-1-4A	OB 0-2 03/11/93 PBC-2-1	OB 0-2 03/11/93 PBC-2-2	OB 0-2 03/11/93 PBC2-2RE	OB 0-2 03/11/93 PBC-3-1	OB 0-2 03/11/93 PBC-4-1	OB 0-2 03/11/93 PBC-5-1
Pesticides/PCBs (ug/kg)														
beta-BHC	0.0%	0	200	0	N	N	19 U	18 U	1.8 U	1.9 U	N	9.1 U	3.7 U	19 U
delta-BHC	0.0%	0	300	0	N	N	19 U	18 U	1.8 U	1.9 U	N	9.1 U	3.7 U	19 U
gamma-BHC (Lindane)	7.7%	0	60	0	N	N	19 U	18 U	1.8 U	1.9 U	N	9.1 U	3.7 U	9.6 J
Heptachlor	7.7%	1	100	0	N	N	19 U	18 U	1.8 U	1.9 U	N	32 J	3.7 U	19 U
Aldrin	23.1%	0	41	0	N	N	19 U	18 U	3.7	3.8	N	9.1 U	4 J	19 U
Heptachlor epoxide	0.0%	0	20	0	N	N	19 U	18 U	1.8 U	1.9 U	N	9.1 U	3.7 U	19 U
Endosulfan I	15.4%	0	900	0	N	N	19 U	18 U	1.8 U	2.6 J	N	9.1 U	1.9 J	19 U
Dieldrin	0.0%	0	44	0	N	N	38 U	36 U	3.6 U	3.6 U	N	18 U	7.2 U	36 U
4,4'-DDE	15.4%	0	2100	0	N	N	38 U	36 U	3.6 U	3.6 U	N	18 U	7.2 U	36 U
Endrin	0.0%	0	100	0	N	N	38 U	36 U	3.6 U	3.6 U	N	18 U	7.2 U	36 U
Endosulfan II	15.4%	1	900	0	N	N	38 U	36 U	3.6 U	2.8 J	N	18 U	7.2 U	110
4,4'-DDD	15.4%	0	2900	0	N	N	38 U	36 U	3.7	3.6 J	N	18 U	7.2 U	36 U
Endosulfan sulfate	15.4%	0	1000	0	N	N	38 U	36 U	3.9	3.6 U	N	18 U	4.3 J	36 U
4,4'-DDT	23.1%	0	2100	0	N	N	38 U	36 U	3.6 U	3.6 J	N	18 U	7.2 U	36 U
Endrin aldehyde	14.3%	0		NA	N	N	N	N	3.6 U	4.5 J	N	18 U	7.2 U	36 U
alpha-Chlordane	23.1%	1	540	0	N	N	190 U	180 U	1.8 U	1.9 U	N	69 J	6.1 J	270 J
Aroclor-1254	0.0%	0	1000	0	N	N	380 U	360 U	36 U	36 U	N	180 U	72 U	360 U
Aroclor-1260	0.0%	0	1000	0	N	N	380 U	360 U	36 U	36 U	N	180 U	72 U	360 U
Explosives (ug/kg)														
HMX	0.0%	0		NA	N	N	1000 U	1000 U	120 U	120 U	N	120 U	120 U	120 U
RDX	8.3%	1		NA	N	N	120 U	120 U	120 U	120 U	N	120 U	88 J	120 U
1,3,5-Trinitrobenzene	33.3%	4		NA	N	N	120 U	120 U	120 U	120 U	N	120 U	120 U	130 J
1,3-Dinitrobenzene	0.0%	0		NA	N	N	120 U	120 U	120 U	120 U	N	120 U	120 U	120 U
Tetryl	0.0%	0		NA	N	N	400 U	400 U	120 U	120 U	N	120 U	120 U	120 U
2,4,6-Trinitrotoluene	16.7%	2		NA	N	N	120 U	120 U	120 U	120 U	N	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	16.7%	2		NA	N	N	120 U	120 U	120 U	120 U	N	120 U	120 U	120 U
2-amino-4,6-Dinitrotoluene	8.3%	1		NA	N	N	120 U	120 U	120 U	120 U	N	120 U	120 U	120 U
2,6-Dinitrotoluene	0.0%	0	1000	0	N	N	120 U	120 U	120 U	120 U	N	120 U	120 U	120 U
2,4-Dinitrotoluene	58.3%	7		NA	N	N	120 U	120 U	180	620	N	120 U	360	980
Metals (mg/kg)														
Aluminum	100.0%	1	17503.0	2	N	N	16900	15700	13900	12600	N	10800	13300	14700
Antimony	33.3%	2	5	3	N	N	6.4 UJ	6 UJ	4.6 J	3.5 UJ	N	6.4 J	143 J	34.1 J
Arsenic	91.7%	1	7.5	1	N	N	3.8 J	5 J	4.6	3.6	N	3.9	4.1	5.6
Barium	100.0%	9	300	7	N	N	911	566	124	102	N	727	209	1190
Beryllium	50.0%	0	1	0	N	N	0.9 R	0.9 R	0.67 J	0.55 J	N	0.48 J	0.4 J	0.6 J
Cadmium	100.0%	8	1.8	10	N	N	3.9	3.3	1	5	N	2.8	7.2	3.1
Calcium	100.0%	0	46825.0	0	N	N	23600	20600	22200	25200	N	31100	24500	27800
Chromium	83.3%	0	26.6	7	N	N	32.1 J	27.3 J	28.3	31.6	N	21.4	17.6	27.4
Cobalt	100.0%	0	30	0	N	N	12.3	11.9	12.7	13.7	N	12	8.4 J	14.4
Copper	100.0%	12	25	12	N	N	522	281	2600	204	N	1430	563	13000
Iron	100.0%	0	32698.0	5	N	N	37000	31800	29300	42600	N	23000	18700	29700
Lead	100.0%	12	30	12	N	N	256	475	256	108	N	837	603	4280
Magnesium	100.0%	0	9071.1	0	N	N	7280	6210	7050	6580	N	5690	4460	7270
Manganese	100.0%	0	1065.8	0	N	N	475	562	322	377	N	369	250	447
Mercury	41.7%	3	0.1	3	N	N	0.16 R	0.13 R	0.04 U	0.04 U	N	0.04 U	0.03 J	0.11
Nickel	100.0%	1	41.3	9	N	N	46.9 J	42.1 J	50.6 J	66.1 J	N	39.9 J	33.3 J	49.9 J
Potassium	100.0%	5	1529.6	9	N	N	2470 J	2030 J	1570	1420	N	1110	678 J	1920
Selenium	58.3%	5	2	0	N	N	0.21 J	0.34 J	0.22 UJ	0.29 J	N	0.15 UJ	0.37 J	0.21 UJ
Silver	66.7%	4	0.6	6	N	N	0.46 J	0.38 U	0.69 U	0.56 U	N	0.72 J	0.78 U	1.4
Sodium	83.3%	6	76	10	N	N	217 J	195 J	100 J	99.5 J	N	175 J	93.4 U	200 J
Thallium	16.7%	2	0.3	2	N	N	0.5 U	0.33 U	0.51 U	0.45 U	N	0.34 U	0.61 U	0.48 U
Vanadium	91.7%	0	150	0	N	N	23.9	23.1	20.1	18.7	N	18	12.8	21
Zinc	100.0%	12	89.1	12	N	N	578	440	579	2030	N	799	127000	3180
Cyanide	0.0%	0	NA	NA	N	N	0.71 U	0.6 U	0.65 U	0.65 U	N	0.63 U	0.65 U	0.66 U

NOTES:

a) * = As per proposed TAGM. Total VOCs <10 ppm. Total Semi-VOCs <500 ppm. Individual Semi-VOCs <50 ppm.
For certain metals, the TAGM is equal to the greater value between the proposed TAGM and site background
The number of samples above the TAGM was determined by comparison to the actual number given, not the MDL
b) The TAGM for 1,2-Dichloroethene (trans) was used for 1,2-Dichloroethene (total) since it was the only value available.
c) NA = not applicable
d) N = Compound was not analyzed.
e) U = Compound was not detected.
f) J = The reported value is an estimated concentration.
g) R = The data was rejected in the data validation process.
h) SB = Site background
i) MDL = Method detection limit

TABLE 2-4

PAD D
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD-D 3 0' 12/04/91 BE-D-1-91	PAD D 2 5' 12/04/91 BE-D-2-91	OB 2 0 feet 12/04/92 BE-D-3	PAD D 0-6" 01/07/92 PBD-1-1	PAD D 0-6" 01/07/92 PBD-1-1RE	PAD D 0-6" 01/07/92 PBD-1-1A	PAD D 0-6" 01/07/92 PBD-1-1ARE	PAD D 2-4' 01/07/92 PBD-1-3	PAD D 2-4' 01/07/92 PBD-1-3A
VOCs (ug/kg)													
Methylene Chloride	0.0%	0	100	0	N	6 U	12 U	5 U J	7 U J	9 U J	5 U J	6 U J	7 U J
Acetone	0.0%	0	200	0	N	11 U	12 U	10 U J	11 U J	11 U J	11 U J	11 U J	11 U J
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	N	6 U	12 U	5 U J	5 U J	5 U J	5 U J	5 U J	6 U J
Chloroform	0.0%	0	300	0	N	6 U	12 U	5 U J	5 U J	5 U J	5 U J	5 U J	6 U J
2-Butanone	0.0%	0	300	0	N	11 U	12 U	10 U J	11 U J	11 U J	11 U J	11 U J	11 U J
1,1,1-Trichloroethane	0.0%	0	800	0	N	6 U	12 U	5 U J	5 U J	5 U J	5 U J	5 U J	6 U J
Carbon Tetrachloride	0.0%	0	600	0	N	6 U	12 U	5 U J	5 U J	5 U J	5 U J	5 U J	6 U J
Trichloroethene	0.0%	0	700	0	N	6 U	12 U	5 U J	5 U J	5 U J	5 U J	5 U J	6 U J
Benzene	25.0%	3	60	0	N	6 U	12 U	5 U J	5 U J	5 U J	5 U J	3 J	3 J
Tetrachloroethene	25.0%	2	1400	0	N	1 J	2 J	5 U J	5 U J	5 U J	5 U J	5 U J	6 U J
Toluene	12.5%	2	1500	0	N	6 U	12 U	5 U J	5 U J	5 U J	5 U J	2 J	6 U J
Chlorobenzene	0.0%	0	1700	0	N	6 U	12 U	5 U J	5 U J	5 U J	5 U J	5 U J	6 U J
Xylene (total)	0.0%	0	1200	0	N	6 U	12 U	5 U J	5 U J	5 U J	5 U J	5 U J	6 U J
Semivolatiles (ug/kg)													
Phenol	0.0%	0	30 or MDL	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
2-Methylphenol	0.0%	0	100 or MDL	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
4-Methylphenol	0.0%	0	900	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
Benzoic acid	0.0%	0	2700	0	N	3600 U	N	3400 U	N	3500 U	N	3500 U	3500 U
Naphthalene	33.3%	210	13,000	0	N	750 U	400 U	700 U	N	710 U	N	210 J	190 J
2-Methylnaphthalene	50.0%	220	36,400	0	N	750 U	27 J	700 U	N	710 U	N	220 J	160 J
2-Chloronaphthalene	0.0%	0	50,000*	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
2-Nitroaniline	0.0%	0	430 or MDL	0	N	3600 U	970 U	3400 U	N	3500 U	N	3500 U	3500 U
Acenaphthylene	0.0%	0	41,000	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
2,6-Dinitrotoluene	16.7%	120	1000	0	N	750 U	120 J	700 U	N	710 U	N	720 U	720 U
3-Nitroaniline	0.0%	0	500 or MDL	0	N	3600 U	970 U	3400 U	N	3500 U	N	3500 U	3500 U
Acenaphthene	0.0%	0	50,000*	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
Dibenzofuran	0.0%	0	6200	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
2,4-Dinitrotoluene	16.7%	1400	50,000*	0	N	750 U	1400	700 U	N	710 U	N	720 U	720 U
Diethylphthalate	0.0%	0	7100	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
Fluorene	0.0%	0	50,000*	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
N-Nitrosodiphenylamine	16.7%	82	50,000*	0	N	750 U	82 J	700 U	N	710 U	N	720 U	720 U
Hexachlorobenzene	0.0%	0	410	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	N	3600 U	970 U	3400 U	N	3500 U	N	3500 U	3500 U
Phenanthrene	50.0%	180	50,000*	0	N	750 U	78 J	700 U	N	710 U	N	160 J	180 J
Anthracene	16.7%	25	50,000*	0	N	750 U	25 J	700 U	N	710 U	N	720 U	720 U
Carbazole	0.0%	0	50,000*	0	N	N	400 U	N	N	N	N	N	N
Di-n-butylphthalate	33.3%	690	8100	0	N	400 J	690	700 U	N	710 U	N	720 U	720 U
Fluoranthene	16.7%	180	50,000*	0	N	750 U	180 J	700 U	N	710 U	N	720 U	720 U
Pyrene	16.7%	180	50,000*	0	N	750 U	180 J	700 U	N	710 U	N	720 U	720 U
Butylbenzylphthalate	0.0%	0	50,000*	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
Benzo(a)anthracene	16.7%	130	220 or MDL	0	N	750 U	130 J	700 U	N	710 U	N	720 U	720 U
Chrysene	16.7%	160	400	0	N	750 U	160 J	700 U	N	710 U	N	720 U	720 U
bis(2-Ethylhexyl)phthalate	33.3%	120	50,000*	0	N	750 U	400 U	700 U	N	710 U	N	420 J	290 J
Di-n-octylphthalate	0.0%	0	50,000*	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
Benzo(b)fluoranthene	16.7%	180	1100	0	N	750 U	180 J	700 U	N	710 U	N	720 U	720 U
benzo(k)fluoranthene	16.7%	180	1100	0	N	750 U	180 J	700 U	N	710 U	N	720 U	720 U
Benzo(a)pyrene	16.7%	120	61 or MDL	1	N	750 U	120 J	700 U	N	710 U	N	720 U	720 U
Indeno(1,2,3-cd)pyrene	16.7%	130	3200	0	N	750 U	130 J	700 U	N	710 U	N	720 U	720 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	N	750 U	400 U	700 U	N	710 U	N	720 U	720 U
Benzo(g,h,i)perylene	16.7%	93	50,000*	0	N	750 U	93 J	700 U	N	710 U	N	720 U	720 U

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TABLE 2-4

PAD D
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD-D 3.0' 12/04/91 BE-D-1-91	PAD D 2.5' 12/04/91 BE-D-2-91	OB 2.0 feet 12/04/92 BE-D-3	PAD D 0-6" 01/07/92 PBD-1-1	PAD D 0-6" 01/07/92 PBD-1-1RE	PAD D 0-6" 01/07/92 PBD-1-1A	PAD D 0-6" 01/07/92 PBD-1-1ARE	PAD D 2-4' 01/07/92 PBD-1-3	PAD D 2-4' 01/07/92 PBD-1-3A
Pesticides/PCBs (ug/kg)													
beta-BHC	0.0%	0	200	0	N	18 U	2.1 U	17 U	N	17 U	N	18 U	17 U
delta-BHC	16.7%	15	300	0	N	18 U	15 J	17 U	N	17 U	N	18 U	17 U
gamma-BHC (Lindane)	0.0%	0	60	0	N	18 U	2.1 U	17 U	N	17 U	N	18 U	17 U
Heptachlor	0.0%	0	100	0	N	18 U	2.1 U	17 U	N	17 U	N	18 U	17 U
Aldrin	0.0%	0	41	0	N	18 U	2.1 U	17 U	N	17 U	N	18 U	17 U
Heptachlor epoxide	16.7%	1.2	20	0	N	18 U	1.2 J	17 U	N	17 U	N	18 U	17 U
Endosulfan I	16.7%	1.8	900	0	N	18 U	1.8 J	17 U	N	17 U	N	18 U	17 U
Dieldrin	0.0%	0	44	0	N	36 U	4 U	34 U	N	35 U	N	35 U	35 U
4,4'-DDE	16.7%	7.8	2100	0	N	36 U	7.8 J	34 U	N	35 U	N	35 U	35 U
Endrin	0.0%	0	100	0	N	36 U	4 U	34 U	N	35 U	N	35 U	35 U
Endosulfan II	0.0%	0	900	0	N	36 U	4 U	34 U	N	35 U	N	35 U	35 U
4,4'-DDD	16.7%	2.4	2900	0	N	36 U	2.4 J	34 U	N	35 U	N	35 U	35 U
Endosulfan sulfate	0.0%	0	1000	0	N	36 U	4 U	34 U	N	35 U	N	35 U	35 U
4,4'-DDT	0.0%	0	2100	0	N	36 U	4 U	34 U	N	35 U	N	35 U	35 U
Endrin aldehyde	0.0%	0		NA	N	N	4 U		N	N	N	N	N
alpha-Chlordane	0.0%	0	540	0	N	180 U	2.1 U	170 U	N	170 U	N	180 U	170 U
Aroclor-1254	0.0%	0	1000	0	N	360 U	40 U	340 U	N	350 U	N	350 U	350 U
Aroclor-1260	0.0%	0	1000	0	N	360 U	40 U	340 U	N	350 U	N	350 U	350 U
Explosives (ug/kg)													
HMX	0.0%	0		NA	N	1000 U	120 U	1000 U	N	1000 U	N	1000 U	1000 U
RDX	16.7%	190		NA	N	120 U	120 U	120 U	N	120 U	N	120 U	190 J
1,3,5-Trinitrobenzene	33.3%	170		NA	N	170	91 J	120 U	N	120 U	N	120 U	120 U
1,3-Dinitrobenzene	0.0%	0		NA	N	120 U	120 U	120 U	N	120 U	N	120 U	120 U
Tetryl	0.0%	0		NA	N	400 U	120 U	400 U	N	400 U	N	400 U	400 U
2,4,6-Trinitrotoluene	16.7%	95		NA	N	120 U	95 J	120 U	N	120 U	N	120 U	120 U
4-amino-2,6-Dinitrotoluene	16.7%	66		NA	N	120 U	66 J	120 U	N	120 U	N	120 U	120 U
2-amino-4,6-Dinitrotoluene	33.3%	69		NA	N	110 J	69 J	120 U	N	120 U	N	120 U	120 U
2,6-Dinitrotoluene	0.0%	0	1000	0	N	120 U	120 U	120 U	N	120 U	N	120 U	120 U
2,4-Dinitrotoluene	33.3%	910		NA	N	360	910	120 U	N	120 U	N	130 U	120 U
Metals (mg/kg)													
Aluminum	100.0%	21100	17503.0	1	16800	N	21100	6860	N	14600	N	10600	10700
Antimony	33.3%	75.6	5	2	54.2 R	N	19.6 R	5.4 UJ	N	4.9 UJ	N	75.6 J	21.8 J
Arsenic	83.3%	8.6	7.5	3	6.9 R	N	8.1 J	4.7 J	N	4 J	N	8.6 J	8.2 J
Barium	83.3%	1970	300	3	740 R	N	753	48.5 J	N	195 J	N	1970 J	359 J
Beryllium	16.7%	0.83	1	0	0.78 R	N	0.83	0.47 R	N	0.76 R	N	0.5 R	0.62 R
Cadmium	100.0%	24.4	1.8	6	10.9 J	N	24.4	2.4	N	4.7	N	17.6	15.2
Calcium	100.0%	124000	46825.0	1	10600	N	13300	10400	N	19600	N	124000 J	39800 J
Chromium	83.3%	43.2	26.6	3	31.1 R	N	43.2	14.3 J	N	31.2 J	N	40 J	22 J
Cobalt	100.0%	14.4	30	0	11.2	N	12.5	6.7	N	14.4	N	7.7	9.9
Copper	100.0%	12900	25	6	704	N	12900	56.2	N	141	N	1640 J	254 J
Iron	100.0%	36600	32698.0	3	33400	N	33400	19400	N	36600	N	24300	25000
Lead	100.0%	16000	30	6	14400 J	N	9380	123	N	233	N	16000 J	3930 J
Magnesium	100.0%	7540	9071.1	0	5690	N	6000	3230	N	6750	N	7540	6010
Manganese	100.0%	751	1065.8	0	751	N	672	186	N	471	N	480	322
Mercury	33.3%	0.42	0.1	2	0.23 J	N	0.42	0.08 R	N	0.07 R	N	0.06 R	0.1 R
Nickel	100.0%	58.2	41.3	2	36.7	N	48.8	30.2 J	N	58.2 J	N	28.9 J	39.8 J
Potassium	100.0%	2850	1529.6	4	1930 J	N	2850	799 J	N	2280 J	N	2380 J	1410 J
Selenium	100.0%	1	2	0	0.19 J	N	1 J	0.34 J	N	0.34 J	N	0.46 J	0.59 J
Silver	83.3%	42.6	0.6	3	1.7 R	N	42.6	0.38 J	N	1.2 J	N	0.97 J	0.42 J
Sodium	66.7%	324	76	3	295 R	N	318 R	50.3 J	N	162 J	N	324 J	130 J
Thallium	66.7%	0.54	0.3	4	0.62 U	N	0.62 U	0.54 J	N	0.44 J	N	0.44	0.47
Vanadium	66.7%	29.9	150	0	25.3	N	29.9	10.9 R	N	21.6	N	17.9	14.4 R
Zinc	100.0%	13000	89.1	6	13000	N	6530	427	N	959	N	1060	457
Cyanide	0.0%	0	NA	NA	0.67 U	N	0.59 U	0.63 U	N	0.6 U	N	0.58 U	0.63 U

NOTES:
a) * = As per proposed TAGM. Total VOCs <10 ppm. Total Semi-VOCs <500 ppm. Individual Semi-VOCs <50 ppm
For certain metals, the TAGM is equal to the greater value between the proposed TAGM and site background.
The number of samples above the TAGM was determined by comparison to the actual number given, not the MDL.
b) The TAGM for 1,2-Dichloroethene (trans) was used for 1,2-Dichloroethene (total) since it was the only value available.
c) NA = not applicable
d) N = Compound was not analyzed.
e) U = Compound was not detected.
f) J = The reported value is an estimated concentration.
g) R = The data was rejected in the data validation process
h) SB = Site background
i) MDL = Method detection limit

TABLE 2-5

PAD E
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD E 3.0' 12/03/91 BE-E-1-91	OB 2.0 feet 12/03/92 BE-E-3	OB 2.0 feet 12/03/92 BE-E-3RE	PAD E 0-6" 01/08/92 PBE-1-1	PAD E 0-6" 01/08/92 PBE-1-1RE	PAD E 2-4' 01/08/92 PBE-1-3	OB 0-2 03/11/93 PBE-2-1	OB 0-2 03/11/93 PBE-3-1	OB 0-2 03/11/93 PBE3-1RE	OB 0-2 03/11/93 PBE-4-1	OB 0-2 03/11/93 PBE4-1RE	OB 0-2 03/11/93 PBE-5-1
VOCs (ug/kg)																
Methylene Chloride	0.0%	0	100	0	6 U	13 U	N	8 U J	6 U J	7 U	11 U	11 U	11 U	14 U	14 U	11 U
Acetone	0.0%	0	200	0	12 U	13 U	N	10 U J	11 U J	24 U	11 U	11 U	11 U	14 U	14 U	11 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U	13 U	N	5 U J	5 U J	6 U	11 U	11 U	11 U	14 U	14 U	11 U
Chloroform	0.0%	0	300	0	6 U	13 U	N	5 U J	5 U J	6 U	11 U	11 U	11 U	14 U	14 U	11 U
2-Butanone	0.0%	0	300	0	12 U	13 U	N	10 U J	11 U J	12 U	11 U	11 U	11 U	14 U	14 U	11 U
1,1,1-Trichloroethane	0.0%	0	800	0	6 U	13 U	N	5 U J	5 U J	6 U	11 U	11 U	11 U	14 U	14 U	11 U
Carbon Tetrachloride	0.0%	0	600	0	6 U	13 U	N	5 U J	5 U J	6 U	11 U	11 U	11 U	14 U	14 U	11 U
Trichloroethene	0.0%	0	700	0	6 U	13 U	N	5 U J	5 U J	6 U	11 U	11 U	11 U	14 U	14 U	11 U
Benzene	0.0%	0	60	0	6 U	13 U	N	5 U J	5 U J	6 U	11 U	11 U	11 U	14 U	14 U	11 U
Tetrachloroethene	9.1%	8	1400	0	6 U	8 J	N	5 U J	5 U J	6 U	11 U	11 U	11 U	14 U	14 U	11 U
Toluene	18.2%	4	1500	0	6 U	13 U	N	4 J	3 J	6 U	11 U	11 U	11 U	14 U	14 U	11 U
Chlorobenzene	0.0%	0	1700	0	6 U	13 U	N	5 U J	5 U J	6 U	11 U	11 U	11 U	14 U	14 U	11 U
Xylene (total)	0.0%	0	1200	0	6 U	13 U	N	5 U J	5 U J	6 U	11 U	11 U	11 U	14 U	14 U	11 U
Semivolatiles (ug/kg)																
Phenol	0.0%	0	30 or MDL	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
2-Methylphenol	0.0%	0	100 or MDL	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
4-Methylphenol	0.0%	0	900	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Benzoic acid	0.0%	0	2700	0	3700 U	N	N	3300 U	N	3800 U	N	N	N	N	N	N
Naphthalene	22.2%	34	13,000	0	750 U	420 U	420 U	680 U	N	780 U	34 J	20 J	N	390 U	N	360 U
2-Methylnaphthalene	33.3%	120	36,400	0	750 U	420 U	420 U	680 U	N	780 U	120 J	30 J	N	390 U	N	31 J
2-Chloronaphthalene	0.0%	0	50,000*	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
2-Nitroaniline	0.0%	0	430 or MDL	0	3700 U	1000 U	1000 U	3300 U	N	3800 U	870 U	900 U	N	940 U	N	870 U
Acenaphthylene	0.0%	0	41,000	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
2,6-Dinitrotoluene	22.2%	350	1000	0	750 U	350 J	130 J	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
3-Nitroaniline	0.0%	0	500 or MDL	0	3700 U	1000 U	1000 U	3300 U	N	3800 U	870 U	900 U	N	940 U	N	870 U
Acenaphthene	0.0%	0	50,000*	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Dibenzofuran	0.0%	0	6200	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
2,4-Dinitrotoluene	33.3%	4400	50,000*	0	750 U	4400 J	1900 J	680 U	N	160 J	360 U	370 U	N	390 U	N	360 U
Diethylphthalate	0.0%	0	7100	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Fluorene	0.0%	0	50,000*	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
N-Nitrosodiphenylamine	33.3%	340	50,000*	0	750 U	120 J	340 J	680 U	N	290 J	360 U	370 U	N	390 U	N	360 U
Hexachlorobenzene	0.0%	0	410	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	3700 U	1000 U	1000 U	3300 U	N	3800 U	870 U	900 U	N	940 U	N	870 U
Phenanthrene	22.2%	65	50,000*	0	750 U	420 U	420 U	680 U	N	780 U	65 J	20 J	N	390 U	N	360 U
Anthracene	0.0%	0	50,000*	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Carbazole	0.0%	0	50,000*	0	N	420 U	420 U	N	N	N	360 U	370 U	N	390 U	N	360 U
Di-n-butylphthalate	33.3%	1100	8100	0	750 U	1100	1000	680 U	N	660 J	360 U	370 U	N	390 U	N	360 U
Fluoranthene	0.0%	0	50,000*	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Pyrene	11.1%	18	50,000*	0	750 U	420 U	420 U	680 U	N	780 U	18 J	370 U	N	390 U	N	360 U
Butylbenzylphthalate	0.0%	0	50,000*	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Benzo(a)anthracene	0.0%	0	220 or MDL	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Chrysene	0.0%	0	400	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
bis(2-Ethylhexyl)phthalate	11.1%	190	50,000*	0	750 U	190 J	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Di-n-octylphthalate	0.0%	0	50,000*	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Benzo(b)fluoranthene	0.0%	0	1100	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
benzo(k)fluoranthene	0.0%	0	1100	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Benzo(a)pyrene	11.1%	18	61 or MDL	0	750 U	420 U	420 U	680 U	N	780 U	360 U	18 J	N	390 U	N	360 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	750 U	420 U	420 U	680 U	N	780 U	360 U	370 U	N	390 U	N	360 U

TABLE 2-5

PAD E
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD E 3.0' 12/03/91 BE-E-1-91	OB 2.0 feet 12/03/92 BE-E-3	OB 2.0 feet 12/03/92 BE-E-3RE	PAD E 0-6" 01/08/92 PBE-1-1	PAD E 0-6" 01/08/92 PBE-1-1RE	PAD E 2-4' 01/08/92 PBE-1-3	OB 0-2 03/11/93 PBE-2-1	OB 0-2 03/11/93 PBE-3-1	OB 0-2 03/11/93 PBE3-1RE	OB 0-2 03/11/93 PBE-4-1	OB 0-2 03/11/93 PBE4-1RE	OB 0-2 03/11/93 PBE-5-1
Pesticides/PCBs (ug/kg)																
beta-BHC	0.0%	0	200	0	18 U	2.2 U	N	17 U	N	19 U	3.7 U	19 U	N	2 U	N	1.8 U
delta-BHC	0.0%	0	300	0	18 U	2.2 U	N	17 U	N	19 U	3.7 U	19 U	N	2 U	N	1.8 U
gamma-BHC (Lindane)	0.0%	0	60	0	18 U	2.2 U	N	17 U	N	19 U	3.7 U	19 U	N	2 U	N	1.8 U
Heptachlor	0.0%	0	100	0	18 U	2.2 U	N	17 U	N	19 U	3.7 U	19 U	N	2 U	N	1.8 U
Aldrin	25.0%	3.2	41	0	18 U	3.2 J	N	17 U	N	19 U	3.7 U	19 U	N	2 U	N	0.96 J
Heptachlor epoxide	0.0%	0	20	0	18 U	2.2 U	N	17 U	N	19 U	3.7 U	19 U	N	2 U	N	1.8 U
Endosulfan I	0.0%	0	900	0	18 U	2.2 U	N	17 U	N	19 U	3.7 U	19 U	N	2 U	N	1.8 U
Dieldrin	0.0%	0	44	0	37 U	4.2 U	N	33 U	N	38 U	7.3 U	37 U	N	3.9 U	N	3.6 U
4,4'-DDE	0.0%	0	2100	0	37 U	4.2 U	N	33 U	N	38 U	7.3 U	37 U	N	3.9 U	N	3.6 U
Endrin	0.0%	0	100	0	37 U	4.2 U	N	33 U	N	38 U	7.3 U	37 U	N	3.9 U	N	3.6 U
Endosulfan II	12.5%	4.6	900	0	37 U	4.2 U	N	33 U	N	38 U	4.6 J	37 U	N	3.9 U	N	3.6 U
4,4'-DDD	0.0%	0	2900	0	37 U	4.2 U	N	33 U	N	38 U	7.3 U	37 U	N	3.9 U	N	3.6 U
Endosulfan sulfate	12.5%	3.9	1000	0	37 U	4.2 U	N	33 U	N	38 U	3.9 J	37 U	N	3.9 U	N	3.6 U
4,4'-DDT	12.5%	2.5	2100	0	37 U	2.5 J	N	33 U	N	38 U	7.3 U	37 U	N	3.9 U	N	3.6 U
Endrin aldehyde	0.0%	0		NA	N	4.2 U	N	N	N	N	7.3 U	37 U	N	3.9 U	N	3.6 U
alpha-Chlordane	25.0%	5.4	540	0	180 U	2.2 U	N	170 U	N	190 U	5.4	19 U	N	2 U	N	1.4 J
Aroclor-1254	0.0%	0	1000	0	370 U	42 U	N	330 U	N	380 U	73 U	370 U	N	39 U	N	36 U
Aroclor-1260	0.0%	0	1000	0	370 U	42 U	N	330 U	N	380 U	73 U	370 U	N	39 U	N	36 U
Explosives (ug/kg)																
HMX	0.0%	0		NA	1000 U	120 U	N	1000 U	N	1000 U	120 U	120 U	N	120 U	N	120 U
RDX	0.0%	0		NA	120 U	120 U	N	120 U	N	120 U	120 U	120 U	N	120 U	N	120 U
1,3,5-Trinitrobenzene	12.5%	120		NA	120 J	120 U	N	120 U	N	120 U	120 U	120 U	N	120 U	N	120 U
1,3-Dinitrobenzene	0.0%	0		NA	120 U	120 U	N	120 U	N	120 U	120 U	120 U	N	120 U	N	120 U
Tetryl	0.0%	0		NA	400 U	120 U	N	400 U	N	400 U	120 U	120 U	N	120 U	N	120 U
2,4,6-Trinitrotoluene	0.0%	0		NA	120 U	120 U	N	120 U	N	120 U	120 U	120 U	N	120 U	N	120 U
4-amino-2,6-Dinitrotoluene	12.5%	78		NA	120 U	78 J	N	120 U	N	120 U	120 U	120 U	N	120 U	N	120 U
2-amino-4,6-Dinitrotoluene	25.0%	86		NA	86 J	70 J	N	120 U	N	120 U	120 U	120 U	N	120 U	N	120 U
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	N	120 U	N	120 U	120 U	120 U	N	120 U	N	120 U
2,4-Dinitrotoluene	62.5%	1900		NA	1900	430	N	120 U	N	510	240	120	N	120 U	N	120 U
Metals (mg/kg)																
Aluminum	100.0%	20200	17503.0	1	17500	19500	N	15500	N	20200	15700	14200	N	12600	N	12900
Antimony	12.5%	13.3	5	1	5.4 R	12.6 R	N	5.1 UJ	N	5.8 UJ	5.4 UJ	13.3 J	N	5 UJ	N	5.1 UJ
Arsenic	87.5%	6.1	7.5	0	6.2 R	6.1 J	N	4.5 J	N	5.8 J	5.2	4.8	N	5.6	N	4.1
Barium	87.5%	699	300	2	680 R	699	N	38	N	211	143	309	N	96.8	N	61.4
Beryllium	62.5%	1.1	1	1	0.85 R	1.1	N	0.78 R	N	0.79 R	0.69 J	0.57	N	0.58 J	N	0.61 J
Cadmium	75.0%	7.9	1.8	5	7.9 J	5.1	N	2.9	N	3.2	1.4	2.8	N	0.36 U	N	0.37 U
Calcium	100.0%	25100	46825.0	0	8930	6080	N	25100	N	8720	22500	24500	N	19400	N	19200
Chromium	87.5%	32.7	26.6	5	32.2 R	32.6	N	27.4 J	N	28.5 J	29.5	32.7	N	24.2	N	24.2
Cobalt	100.0%	14.9	30	0	14.2	13.2	N	14.3	N	10.5	14.8	12.6	N	14.9	N	13.5
Copper	100.0%	847	25	8	444	847	N	37.9	N	133	125	235	N	39.9	N	36.2
Iron	100.0%	52000	32698.0	4	52000	32500	N	35700	N	33200	33400	26800	N	27100	N	29000
Lead	87.5%	1260	30	6	1260 J	1090	N	30.4 R	N	205	140	224	N	26.2	N	180
Magnesium	100.0%	7700	9071.1	0	5930	6280	N	7700	N	5810	7670	6570	N	6410	N	6340
Manganese	100.0%	656	1065.8	0	656	604	N	313	N	549	404	374	N	317	N	290
Mercury	62.5%	0.24	0.1	2	0.18 J	0.24	N	0.07 R	N	0.09 R	0.06 J	0.05 J	N	0.05 U	N	0.03 J
Nickel	100.0%	58.5	41.3	7	47.2	43.9	N	58.5 J	N	34.6 J	55.2 J	56.5 J	N	50.5 J	N	51.9 J
Potassium	100.0%	2250	1529.6	6	2030 J	2250	N	1490 J	N	2170 J	2160	1550	N	1490	N	1620
Selenium	100.0%	2.1	2	1	0.28 J	2.1 J	N	0.39 J	N	0.19 J	0.26 J	0.4 J	N	0.46 J	N	0.41 J
Silver	37.5%	0.91	0.6	2	0.54 R	0.91 J	N	0.51 J	N	0.37 U	0.85 U	0.84 J	N	0.78 U	N	0.8 U
Sodium	75.0%	322	76	6	123 R	109 R	N	93.7 J	N	322 J	141 J	197 J	N	98.3 J	N	102 J
Thallium	0.0%	0	0.3	0	0.61 U	0.64 U	N	0.47 U	N	0.35 U	0.46 U	0.55 U	N	0.51 U	N	0.45 U
Vanadium	100.0%	28.8	150	0	28	28.8	N	19.9	N	28.8	21.8	18.6	N	18.7	N	18.1
Zinc	100.0%	1060	89.1	8	775	958	N	195	N	158	374 J	1060	N	187 J	N	143 J
Cyanide	0.0%	0	NA	NA	N	0.6 U	N	0.6 U	N	0.61 U	0.66 U	0.67 U	N	0.56 U	N	0.53 U

NOTES:
a) * = As per proposed TAGM. Total VOCs <10 ppm. Total Semi-VOCs <500 ppm. Individual Semi-VOCs <50 ppm.
For certain metals, the TAGM is equal to the greater value between the proposed TAGM and site background.
The number of samples above the TAGM was determined by comparison to the actual number given, not the MDL.
b) The TAGM for 1,2-Dichloroethene (trans) was used for 1,2-Dichloroethene (total) since it was the only value available.
c) NA = not applicable
d) N = Compound was not analyzed.
e) U = Compound was not detected.
f) J = The reported value is an estimated concentration.
g) R = The data was rejected in the data validation process.
h) SB = Site background
i) MDL = Method detection limit

TABLE 2-6

PAD F
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD F 2.0' 12/12/91 BE-F-1-91	PAD F 2.0' 12/10/91 BE-F-2-91	PAD-F 2.0' 12/10/91 BE-F-2-91DL	PAD F 2.0' 12/10/91 BE-F-2A-91	PAD-F 2.0' 12/10/91 BE-F-2A-91DL	OB 2.0 feet 12/03/92 BE-F-5	OB 2.0 feet 12/03/92 BE-F-6	OB 2.0 feet 12/03/92 BE-F-6RE	PAD-F 0-6" 12/11/91 PB-F-1-1	PAD-F 4-6' 12/12/91 PB-F-1-4
VOCs (ug/kg)														
Methylene Chloride	0.0%	0	100	0	6 U	5 U	N	6 U	N	12 U	12 U	N	6 U	6 U
Acetone	6.7%	52	200	0	11 U	11 U	N	11 U	N	12 U	12 U	N	11 U	36 U
1,2-Dichloroethene (total)	6.7%	1	300 (b)	0	6 U	5 U	N	6 U	N	12 U	12 U	N	6 U	6 U
Chloroform	0.0%	0	300	0	6 U	5 U	N	6 U	N	12 U	12 U	N	6 U	6 U
2-Butanone	6.7%	9	300	0	11 U	11 U	N	11 U	N	12 U	12 U	N	11 U	11 U
1,1,1-Trichloroethane	0.0%	0	800	0	6 U	5 U	N	6 U	N	12 U	12 U	N	6 U	6 U
Carbon Tetrachloride	0.0%	0	600	0	6 U	5 U	N	6 U	N	12 U	12 U	N	6 U	6 U
Trichloroethene	6.7%	2	700	0	6 U	5 U	N	6 U	N	12 U	12 U	N	6 U	6 U
Benzene	6.7%	1	60	0	6 U	1 J	N	6 U	N	12 U	12 U	N	6 U	6 U
Tetrachloroethene	33.3%	6	1400	0	6 U	2 J	N	1 J	N	3 J	6 J	N	6 U	6 U
Toluene	20.0%	5	1500	0	6 U	5 J	N	2 J	N	12 U	12 U	N	6 U	2 J
Chlorobenzene	0.0%	0	1700	0	6 U	5 U	N	6 U	N	12 U	12 U	N	6 U	6 U
Xylene (total)	6.7%	8	1200	0	6 U	5 U	N	6 U	N	12 U	12 U	N	6 U	6 U
Semivolatiles (ug/kg)														
Phenol	0.0%	0	30 or MDL	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
2-Methylphenol	0.0%	0	100 or MDL	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
4-Methylphenol	0.0%	0	900	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Benzoic acid	0.0%	0	2700	0	3500 U	3500 U	N	3500 U	N	N	N	N	3500 U	3600 U
Naphthalene	25.0%	94	13,000	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
2-Methylnaphthalene	62.5%	1300	36,400	0	720 U	730 U	N	720 U	N	22 J	390 U	390 U	100 J	730 U
2-Chloronaphthalene	0.0%	0	50,000*	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
2-Nitroaniline	0.0%	0	430 or MDL	0	3500 U	3500 U	N	3500 U	N	980 U	950 U	950 U	3500 U	3600 U
Acenaphthylene	0.0%	0	41,000	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
2,6-Dinitrotoluene	37.5%	570	1000	0	720 U	100 J	N	250 J	N	400 U	390 U	390 U	730 U	730 U
3-Nitroaniline	0.0%	0	500 or MDL	0	3500 U	3500 U	N	3500 U	N	980 U	950 U	950 U	3500 U	3600 U
Acenaphthene	12.5%	210	50,000*	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Dibenzofuran	6.3%	93	6200	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
2,4-Dinitrotoluene	68.8%	8000	50,000*	0	720 U	1400	N	4200	N	180 J	46 J	18 J	730 U	730 U
Diethylphthalate	0.0%	0	7100	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Fluorene	6.3%	250	50,000*	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
N-Nitrosodiphenylamine	37.5%	1500	50,000*	0	720 U	1000 J	N	580 J	N	400 U	390 U	390 U	730 U	730 U
Hexachlorobenzene	6.3%	28	410	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	3500 U	3500 U	N	3500 U	N	980 U	950 U	950 U	3500 U	3600 U
Phenanthrene	56.3%	1000	50,000*	0	720 U	730 U	N	75 J	N	400 U	390 U	390 U	730 U	730 U
Anthracene	6.3%	39	50,000*	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Carbazole	0.0%	0	50,000*	0	N	N	N	N	N	400 U	390 U	390 U	N	N
Di-n-butylphthalate	56.3%	3100	8100	0	720 U	200 J	N	3100 J	N	140 J	390 U	390 U	730 U	730 U
Fluoranthene	25.0%	66	50,000*	0	720 U	730 U	N	66 J	N	400 U	390 U	390 U	730 U	730 U
Pyrene	0.0%	0	50,000*	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Butylbenzylphthalate	0.0%	0	50,000*	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Benzo(a)anthracene	0.0%	0	220 or MDL	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Chrysene	0.0%	0	400	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
bis(2-Ethylhexyl)phthalate	37.5%	800	50,000*	0	720 U	730 U	N	89 J	N	320 J	210 J	390 U	730 U	730 U
Di-n-octylphthalate	6.3%	220	50,000*	0	720 U	220 J	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Benzo(b)fluoranthene	0.0%	0	1100	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
benzo(k)fluoranthene	0.0%	0	1100	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Benzo(a)pyrene	0.0%	0	61 or MDL	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	720 U	730 U	N	720 U	N	400 U	390 U	390 U	730 U	730 U

TABLE 2-6

PAD F
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD F 2.0' 12/12/91 BE-F-1-91	PAD F 2.0' 12/10/91 BE-F-2-91	PAD-F 2.0' 12/10/91 BE-F-2-91DL	PAD F 2.0' 12/10/91 BE-F-2A-91	PAD-F 2.0' 12/10/91 BE-F-2A-91DL	OB 2.0 feet 12/03/92 BE-F-5	OB 2.0 feet 12/03/92 BE-F-6	OB 2.0 feet 12/03/92 BE-F-6RE	PAD-F 0-6" 12/11/91 PB-F-1-1	PAD-F 4-6' 12/12/91 PB-F-1-4
Pesticides/PCBs (ug/kg)														
beta-BHC	0.0%	0	200	0	17 U	18 U	N	17 U	N	2.1 U	2 U	2 U	18 U	18 U
delta-BHC	6.3%	2.4	300	0	17 U	18 U	N	17 U	N	2.4 J	2 U	2 U	18 U	18 U
gamma-BHC (Lindane)	0.0%	0	60	0	17 U	18 U	N	17 U	N	2.1 U	2 U	2 U	18 U	18 U
Heptachlor	0.0%	0	100	0	17 U	18 U	N	17 U	N	2.1 U	2 U	2 U	18 U	18 U
Aldrin	18.8%	3.3	41	0	17 U	18 U	N	17 U	N	2.1 U	2 U	2 U	18 U	18 U
Heptachlor epoxide	0.0%	0	20	0	17 U	18 U	N	17 U	N	2.1 U	2 U	2 U	18 U	18 U
Endosulfan I	12.5%	3.7	900	0	17 U	18 U	N	17 U	N	2.1 U	2 U	2 U	18 U	18 U
Dieldrin	0.0%	0	44	0	35 U	35 U	N	35 U	N	4 U	3.9 U	3.9 U	35 U	36 U
4,4'-DDE	12.5%	1.6	2100	0	35 U	35 U	N	35 U	N	4 U	3.9 U	3.9 U	35 U	36 U
Endrin	12.5%	2.4	100	0	35 U	35 U	N	35 U	N	4 U	3.9 U	3.9 U	35 U	36 U
Endosulfan II	0.0%	0	900	0	35 U	35 U	N	35 U	N	4 U	3.9 U	3.9 U	35 U	36 U
4,4'-DDD	37.5%	3.6	2900	0	35 U	35 U	N	35 U	N	4 U	3.9 U	3.9 U	35 U	36 U
Endosulfan sulfate	6.3%	2.5	1000	0	35 U	35 U	N	35 U	N	4 U	3.9 U	3.9 U	35 U	36 U
4,4'-DDT	18.8%	5.3	2100	0	35 U	35 U	N	35 U	N	5.3 J	3.9 U	2.6 J	35 U	36 U
Endrin aldehyde	0.0%	0		NA	N	N	N	N	N	4 U	3.9 U	3.9 U	N	N
alpha-Chlordane	0.0%	0	540	0	170 U	180 U	N	170 U	N	2.1 U	2 U	2 U	180 U	180 U
Aroclor-1254	0.0%	0	1000	0	350 U	350 U	N	350 U	N	40 U	39 U	39 U	350 U	360 U
Aroclor-1260	6.3%	180	1000	0	350 U	350 U	N	180 J	N	40 U	39 U	39 U	350 U	360 U
Explosives (ug/kg)														
HMX	11.8%	580		NA	1000 U	1000 U	10000 R	1000 U	25000 R	580	150	N	1000 U	1000 U
RDX	58.8%	1300		NA	180	1000	1200 R	1100	3100 R	1300	170	N	280	120 U
1,3,5-Trinitrobenzene	52.9%	7800		NA	110 J	7700 R	7800 J	5800 R	6800 J	170	120 U	N	160	120 U
1,3-Dinitrobenzene	11.8%	200		NA	120 U	180	1200 R	200	3100 R	120 U	120 U	N	120 U	120 U
Tetryl	29.4%	1000		NA	400 U	400 U	4000 R	400 U	10000 R	120 U	120 U	N	400 U	400 U
2,4,6-Trinitrotoluene	64.7%	80000		NA	150	26000 R	25000 J	80000 R	80000 J	280	85 J	N	590	120 U
4-amino-2,6-Dinitrotoluene	64.7%	8900		NA	870	1300 J	1900 R	150 J	3100 R	650	270	N	2500	120 U
2-amino-4,6-Dinitrotoluene	64.7%	11000		NA	1000	2500	2500 R	1800	2000 R	720	320	N	2700	120 U
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	1200 R	120 U	3100 R	120 U	120 U	N	120 U	120 U
2,4-Dinitrotoluene	76.5%	5100		NA	200	1600 J	1500 R	1600 J	1800 R	300	110 J	N	570	120 U
Metals (mg/kg)														
Aluminum	100.0%	21300	17503.0	4	14600	19900	N	21300	N	18400	18300	N	16100	16100
Antimony	46.7%	18.4	5	6	5.5 R	21.3 R	N	19.9 R	N	17 R	11.8 R	N	9.7 R	5.7 R
Arsenic	80.0%	6.7	7.5	0	8 R	9.5 R	N	15.4 R	N	5.4 J	5.1 J	N	4.1 J	3.5 J
Barium	93.3%	4570	300	12	674 R	3300	N	4570	N	975	563	N	1560 J	178 J
Beryllium	66.7%	0.95	1	0	0.85 R	0.71 R	N	0.78 R	N	0.86	0.95	N	0.64 R	0.69 R
Cadmium	93.3%	11.4	1.8	8	3.5 J	10.1 J	N	11.4 J	N	2.2	0.41 J	N	8.8	3.3
Calcium	100.0%	105000	46825.0	2	6070	17200	N	N	N	11200	6640	N	105000 J	42300 J
Chromium	80.0%	31.5	26.6	4	21.1 R	34.1 R	N	37 R	N	31.1	25.3	N	24.2	24.4
Cobalt	100.0%	14.4	30	0	10.9	11.7	N	12.1	N	13.3	13.3	N	9.1	11.2
Copper	93.3%	1770	25	14	100	787	N	1770	N	263	118	N	90.9 J	52 J
Iron	100.0%	47600	32698.0	5	23600	47600	N	42200	N	36200	27000	N	22900 J	28300 J
Lead	100.0%	13100	30	15	2350 J	5310 J	N	9340 J	N	2290	2320	N	2320 J	59.6
Magnesium	100.0%	10600	9071.1	1	4700	6780	N	7570	N	6140	5410	N	10600	7830
Manganese	100.0%	836	1065.8	0	836	697	N	758	N	682	577	N	365	389
Mercury	93.3%	1	0.1	10	0.25 J	0.09 J	N	0.3 J	N	1	0.17	N	0.17	0.03 U
Nickel	100.0%	53.1	41.3	5	26	41.7	N	53.1	N	38.9	31.5	N	37	39.8
Potassium	100.0%	3030	1529.6	11	1380 J	2160 J	N	2500 J	N	2370	1750	N	3030	1780
Selenium	66.7%	1.2	2	0	0.17 J	1 UJ	N	1.1 R	N	1.2 J	1 J	N	0.2 J	0.11 UJ
Silver	40.0%	1	0.6	3	0.36 R	1.1 R	N	2.1 R	N	0.81 J	0.39 U	N	1.6 U	0.92 U
Sodium	86.7%	414	76	12	72.9 J	335 J	N	414 J	N	134 R	62.3 R	N	191 J	97.3 J
Thallium	0.0%	0	0.3	0	0.35 U	0.32 U	N	0.35 U	N	0.41 U	0.5 U	N	0.65 U	0.35 U
Vanadium	100.0%	29.2	150	0	25.3	25.7	N	29.1	N	26.2	29.2	N	20.2	22.3
Zinc	100.0%	2730	89.1	14	138	2730	N	2160	N	389	134	N	494 J	114 J
Cyanide	20.0%	2.2	NA	NA	0.65 U	2	N	2.2	N	0.73 U	0.72 U	N	1.1	0.66 U

TABLE 2-6

PAD F
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 0-2 01/13/93 PBF-2-1	OB 4-6 01/13/93 PBF-2-3	OB 6-8 01/13/93 PBF-2-4	OB 0-2 01/13/93 PBF-2-6	OB 0-2 03/12/93 PBF-3-1	OB 0-2 03/12/93 PBF-3-2	OB 0-2 03/12/93 PBF-4-1	OB 0-2 03/12/93 PBF-5-1	OB 0-2 03/12/93 PBF-6-1
VOCs (ug/kg)													
Methylene Chloride	0.0%	0	100	0	12 U	N	60 U	12 U	11 U	11 U	11 U	11 U	14 U
Acetone	6.7%	52	200	0	22 U	N	52 J	43 U	11 U	11 U	11 U	11 U	14 U
1,2-Dichloroethene (total)	6.7%	1	300 (b)	0	12 U	N	60 U	12 U	11 U	11 U	11 U	1 J	14 U
Chloroform	0.0%	0	300	0	12 U	N	60 U	12 U	11 U	11 U	11 U	11 U	14 U
2-Butanone	6.7%	9	300	0	12 U	N	60 U	9 J	11 U	11 U	11 U	11 U	14 U
1,1,1-Trichloroethane	0.0%	0	800	0	12 U	N	60 U	12 U	11 U	11 U	11 U	11 U	14 U
Carbon Tetrachloride	0.0%	0	600	0	12 U	N	60 U	12 U	11 U	11 U	11 U	11 U	14 U
Trichloroethene	6.7%	2	700	0	12 U	N	60 U	12 U	11 U	11 U	11 U	2 J	14 U
Benzene	6.7%	1	60	0	12 U	N	60 U	12 U	11 U	11 U	11 U	11 U	14 U
Tetrachloroethene	33.3%	6	1400	0	12 U	N	60 U	12 U	11 U	11 U	11 U	4 J	14 U
Toluene	20.0%	5	1500	0	12 U	N	60 U	12 U	11 U	11 U	11 U	11 U	14 U
Chlorobenzene	0.0%	0	1700	0	12 U	N	60 U	12 U	11 U	11 U	11 U	11 U	14 U
Xylene (total)	6.7%	8	1200	0	12 U	N	60 U	12 U	11 U	11 U	8 J	11 U	14 U
Semivolatiles (ug/kg)													
Phenol	0.0%	0	30 or MDL	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
2-Methylphenol	0.0%	0	100 or MDL	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
4-Methylphenol	0.0%	0	900	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Benzoic acid	0.0%	0	2700	0	N	N	N	N	N	N	N	N	N
Naphthalene	25.0%	94	13,000	0	21 J	94 J	N	510 U	23 J	20 J	3400 U	360 U	1200 U
2-Methylnaphthalene	62.5%	1300	36,400	0	82 J	660	N	110 J	66 J	63 J	1300 J	42 J	55 J
2-Chloronaphthalene	0.0%	0	50,000*	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
2-Nitroaniline	0.0%	0	430 or MDL	0	870 U	970 U	N	1200 U	990 U	890 U	8400 U	880 U	2800 U
Acenaphthylene	0.0%	0	41,000	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
2,6-Dinitrotoluene	37.5%	570	1000	0	360 U	400 U	N	240 J	100 J	370 U	3400 U	300 J	570 J
3-Nitroaniline	0.0%	0	500 or MDL	0	870 U	970 U	N	1200 U	990 U	890 U	8400 U	880 U	2800 U
Acenaphthene	12.5%	210	50,000*	0	360 U	130 J	N	510 U	410 U	370 U	210 J	360 U	1200 U
Dibenzofuran	6.3%	93	6200	0	360 U	93 J	N	510 U	410 U	370 U	3400 U	360 U	1200 U
2,4-Dinitrotoluene	68.8%	8000	50,000*	0	100 J	400 U	N	3000 J	1100	160 J	3400 U	2400	8000
Diethylphthalate	0.0%	0	7100	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Fluorene	6.3%	250	50,000*	0	360 U	250 J	N	510 U	410 U	370 U	3400 U	360 U	1200 U
N-Nitrosodiphenylamine	37.5%	1500	50,000*	0	360 U	400 U	N	470 J	610	370 U	3400 U	640	1500
Hexachlorobenzene	6.3%	28	410	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	28 J	1200 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	870 U	970 U	N	1200 U	990 U	890 U	8400 U	880 U	2800 U
Phenanthrene	56.3%	1000	50,000*	0	34 J	790	N	49 J	34 J	32 J	1000 J	22 J	54 J
Anthracene	6.3%	39	50,000*	0	360 U	39 J	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Carbazole	0.0%	0	50,000*	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Di-n-butylphthalate	56.3%	3100	8100	0	270 J	400 U	N	280 J	180 J	230 J	3400 U	330 J	1200
Fluoranthene	25.0%	66	50,000*	0	21 J	60 J	N	26 J	410 U	370 U	3400 U	360 U	1200 U
Pyrene	0.0%	0	50,000*	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Butylbenzylphthalate	0.0%	0	50,000*	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Benzo(a)anthracene	0.0%	0	220 or MDL	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Chrysene	0.0%	0	400	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
bis(2-Ethylhexyl)phthalate	37.5%	800	50,000*	0	620	710	N	800	410 U	370 U	3400 U	360 U	1200 U
Di-n-octylphthalate	6.3%	220	50,000*	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Benzo(b)fluoranthene	0.0%	0	1100	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
benzo(k)fluoranthene	0.0%	0	1100	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Benzo(a)pyrene	0.0%	0	61 or MDL	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	360 U	400 U	N	510 U	410 U	370 U	3400 U	360 U	1200 U

TABLE 2-6

PAD F
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 0-2 01/13/93 PBF-2-1	OB 4-6 01/13/93 PBF-2-3	OB 6-8 01/13/93 PBF-2-4	OB 0-2 01/13/93 PBF-2-6	OB 0-2 03/12/93 PBF-3-1	OB 0-2 03/12/93 PBF-3-2	OB 0-2 03/12/93 PBF-4-1	OB 0-2 03/12/93 PBF-5-1	OB 0-2 03/12/93 PBF-6-1
Pesticides/PCBs (ug/kg)													
beta-BHC	0.0%	0	200	0	1.9 U	2.1 U	N	1.8 U	2.1 U	1.9 U	1.8 U	9.2 U	2.1 U
delta-BHC	6.3%	2.4	300	0	1.9 U	2.1 U	N	1.8 U	2.1 U	1.9 U	1.8 U	9.2 U	2.1 U
gamma-BHC (Lindane)	0.0%	0	60	0	1.9 U	2.1 U	N	1.8 U	2.1 U	1.9 U	1.8 U	9.2 U	2.1 U
Heptachlor	0.0%	0	100	0	1.9 U	2.1 U	N	1.8 U	2.1 U	1.9 U	1.8 U	9.2 U	2.1 U
Aldrin	18.8%	3.3	41	0	1.9 U	2.1 U	N	1.8 U	1.9 J	1 J	3.3	9.2 U	2.1 U
Heptachlor epoxide	0.0%	0	20	0	1.9 U	2.1 U	N	1.8 U	2.1 U	1.9 U	1.8 U	9.2 U	2.1 U
Endosulfan I	12.5%	3.7	900	0	1.9 U	2.1 U	N	1.8 U	2.1 U	3.7 J	1.4 J	9.2 U	2.1 U
Dieldrin	0.0%	0	44	0	3.6 U	4 U	N	3.5 U	4.1 U	3.7 U	3.4 U	18 U	4.1 U
4,4'-DDE	12.5%	1.6	2100	0	1.5 J	4 U	N	1.6 J	4.1 U	3.7 U	3.4 U	18 U	4.1 U
Endrin	12.5%	2.4	100	0	2.4 J	4 U	N	2.4 J	4.1 U	3.7 U	3.4 U	18 U	4.1 U
Endosulfan II	0.0%	0	900	0	3.6 U	4 U	N	3.5 U	4.1 U	3.7 U	3.4 U	18 U	4.1 U
4,4'-DDD	37.5%	3.6	2900	0	2.3 J	4 U	N	1.8 J	3.6 J	2.1 J	2.4 J	18 U	2.2 J
Endosulfan sulfate	6.3%	2.5	1000	0	3.6 U	4 U	N	3.5 U	4.1 U	3.7 U	2.5 J	18 U	4.1 U
4,4'-DDT	18.8%	5.3	2100	0	3.6 U	4 U	N	3.5 U	4.1 U	2.6 J	3.4 U	18 U	4.1 U
Endrin aldehyde	0.0%	0		NA	3.6 U	4 U	N	3.5 U	4.1 U	3.7 U	3.4 U	18 U	4.1 U
alpha-Chlordane	0.0%	0	540	0	1.9 U	2.1 U	N	1.8 U	2.1 U	1.9 U	1.8 U	9.2 U	2.1 U
Aroclor-1254	0.0%	0	1000	0	36 U	40 U	N	35 U	41 U	37 U	34 U	180 U	41 U
Aroclor-1260	6.3%	180	1000	0	36 U	40 U	N	35 U	41 U	37 U	34 U	180 U	41 U
Explosives (ug/kg)													
HMX	11.8%	580		NA	120 U	120 U	N	120 U	120 U	120 U	120 U	380 U	250 U
RDX	58.8%	1300		NA	120 U	120 U	N	120 U	110 J	73 J	120 U	600 J	270
1,3,5-Trinitrobenzene	52.9%	7800		NA	120 U	120 U	N	120 U	590 J	720 J	92 J	500 J	250 U
1,3-Dinitrobenzene	11.8%	200		NA	120 U	120 U	N	120 U	120 U	120 U	120 U	380 U	250 U
Tetryl	29.4%	1000		NA	120 U	120 U	N	120 U	220 J	860	410 J	1000	230 J
2,4,6-Trinitrotoluene	64.7%	80000		NA	120 U	120 U	N	120 U	520 J	1400 J	110 J	5000 J	520 J
4-amino-2,6-Dinitrotoluene	64.7%	8900		NA	120 U	120 U	N	120 U	1400	2400	280 J	8900	1000
2-amino-4,6-Dinitrotoluene	64.7%	11000		NA	120 U	120 U	N	120 U	1300	2200	350 J	11000	1000
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	N	120 U	120 U	120 U	120 U	380 U	250 U
2,4-Dinitrotoluene	76.5%	5100		NA	1700	120 U	N	740	800	850	370	5000	5100
Metals (mg/kg)													
Aluminum	100.0%	21300	17503.0	4	12300	16500	N	11200	14200	12700	14500	14200	17100
Antimony	46.7%	18.4	5	6	14.3 J	6.6 UJ	N	6.3 J	4.8 J	8 J	8.3 J	6 J	18.4 J
Arsenic	80.0%	6.7	7.5	0	6.7 J	4.7 J	N	3.7 J	5.8	6.5	5.8	4.2	6.4
Barium	93.3%	4570	300	12	991	157	N	607	952	798	332	947	2260
Beryllium	66.7%	0.95	1	0	0.56	0.78	N	0.52 J	0.63 J	0.57 J	0.63 J	0.63 J	0.69 J
Cadmium	93.3%	11.4	1.8	8	1.6	0.38 U	N	2.1	1.2	1.1	0.37 J	0.85	1.9
Calcium	100.0%	105000	46825.0	2	17100	3170	N	22700	23600	55600	29000	25000	24500
Chromium	80.0%	31.5	26.6	4	29.5	21.5	N	24.3	29.6	24.1	26.5	25.1	31.5
Cobalt	100.0%	14.4	30	0	11.5	11.8	N	11.3	14.4	11.1	14.3	12.4	14.1
Copper	93.3%	1770	25	14	492	31.8 R	N	1090	303	222	216	255	743
Iron	100.0%	47600	32698.0	5	29900	24100	N	24700	35300	29000	31200	28400	35000
Lead	100.0%	13100	30	15	2850	94.3 J	N	1260	1570	1250	1540	678	13100
Magnesium	100.0%	10600	9071.1	1	5410	3830	N	5430	6570	7960	7460	6240	7240
Manganese	100.0%	836	1065.8	0	399	657	N	439	511	384	425	562	573
Mercury	93.3%	1	0.1	10	0.09 J	0.22	N	0.05 J	0.11 J	0.13	0.15	0.08 J	0.28
Nickel	100.0%	53.1	41.3	5	37.1	22.9	N	35.5	47.5 J	38.1 J	51.7 J	39.4 J	42.7 J
Potassium	100.0%	3030	1529.6	11	1360	1530	N	1160	1570	1860	1630	1440	1920
Selenium	66.7%	1.2	2	0	0.16 J	0.22 J	N	0.28 J	0.27 J	0.18 UJ	0.26 J	0.29 J	1.8 UJ
Silver	40.0%	1	0.6	3	0.47 J	0.65 J	N	0.53 J	1 J	0.6 U	0.68 U	0.63 U	0.74 J
Sodium	86.7%	414	76	12	88.5 J	78.5 J	N	84.7 J	139 J	148 J	121 J	125 J	167 J
Thallium	0.0%	0	0.3	0	0.34 U	0.49 U	N	0.55 U	0.6 U	0.42 U	0.5 U	0.66 U	0.42 U
Vanadium	100.0%	29.2	150	0	17.6	29.1	N	16	20.1	18.5	19.9	20.4	24.7
Zinc	100.0%	2730	89.1	14	465	70.2 J	N	345	304 J	259 J	200 J	1370	617
Cyanide	20.0%	2.2	NA	NA	0.67 U	0.74 U	N	0.64 U	0.73 U	0.68 U	0.64 U	0.66 U	0.77 U

NOTES: a) * = As per proposed TAGM, Total VOCs <10 ppm, Total Semi-VOCs <500 ppm, Individual Semi-VOCs <50 ppm.
For certain metals, the TAGM is equal to the greater value between the proposed TAGM and site background.
The number of samples above the TAGM was determined by comparison to the actual number given, not the MDL.
b) The TAGM for 1,2-Dichloroethene (trans) was used for 1,2-Dichloroethene (total) since it was the only value available.
c) NA = not applicable
d) N = Compound was not analyzed.
e) U = Compound was not detected.
f) J = The reported value is an estimated concentration.
g) R = The data was rejected in the data validation process.
h) SB = Site background
i) MDL = Method detection limit

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TABLE 2-7

PAD G
SUMMARY OF COMPOUNDS DETECTED
GEOPHYS. ANOMALY EXCAVATIONS, BERM EXCAVATIONS, AND PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GAE-G 2.0' 12/11/91 GAE-G-1	GAE-G 2.0' 12/11/91 GAE-G-2	PAD G 2.5' 12/04/91 BE-G-1-91	PAD-G 2.5' 12/04/91 BE-G-1-91RE	PAD G 4.0' 12/05/91 BE-G-2-91	PAD G 4.5' 12/05/91 BE-G-3-91	PAD-G 3.0' 12/05/91 BE-G-6-91	OB 2.0 feet 12/04/92 BE-G-11	OB 2.0 feet 12/07/92 BE-G-13	OB 2.0 feet 12/07/92 BE-G13RE	OB 2.0 feet 12/07/92 BE-G-14	OB 2.0 feet 12/07/92 BE-G14RE
VOCs (ug/kg)																
Methylene Chloride	3.3%	2	100	0	6 U	6 U	6 U	N	6 U	6 U	N	12 U	12 U	N	12 U	N
Acetone	0.0%	0	200	0	12 U	12 U	11 U	N	11 U	11 U	N	12 U	12 U	N	12 U	N
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U	6 U	6 U	N	6 U	6 U	N	12 U	12 U	N	12 U	N
Chloroform	20.0%	12	300	0	6 U	9	6 U	N	6 U	6 U	N	12 U	12 U	N	12 U	N
2-Butanone	0.0%	0	300	0	12 U	12 U	11 U	N	11 U	11 U	N	12 U	12 U	N	12 U	N
1,1,1-Trichloroethane	3.3%	2	800	0	6 U	6 U	6 U	N	6 U	6 U	N	12 U	12 U	N	12 U	N
Carbon Tetrachloride	0.0%	0	600	0	6 U	6 U	6 U	N	6 U	6 U	N	12 U	12 U	N	12 U	N
Trichloroethene	3.3%	1	700	0	6 U	6 U	1 J	N	6 U	6 U	N	12 U	12 U	N	12 U	N
Benzene	0.0%	0	60	0	6 U	6 U	6 U	N	6 U	6 U	N	12 U	12 U	N	12 U	N
Tetrachloroethene	10.0%	15	1400	0	6 U	11	6 U	N	15	6 U	N	12 U	12 U	N	2 J	N
Toluene	6.7%	2	1500	0	6 U	6 U	6 U	N	6 U	1 J	N	12 U	12 U	N	12 U	N
Chlorobenzene	0.0%	0	1700	0	6 U	6 U	6 U	N	6 U	6 U	N	12 U	12 U	N	12 U	N
Xylene (total)	0.0%	0	1200	0	6 U	6 U	6 U	N	6 U	6 U	N	12 U	12 U	N	12 U	N
Semivolatiles (ug/kg)																
Phenol	0.0%	0	30 or MDL	0	800 U	2900 U	730 U	N	730 U	750 U	N	620 U	400 U	N	400 U	400 U
2-Methylphenol	0.0%	0	100 or MDL	0	800 U	2900 U	730 U	N	730 U	750 U	N	620 U	400 U	N	400 U	400 U
4-Methylphenol	0.0%	0	900	0	800 U	2900 U	730 U	N	730 U	750 U	N	620 U	400 U	N	400 U	400 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	620 U	400 U	N	400 U	400 U
Benzoic acid	5.3%	98	2700	0	3900 U	14000 U	3500 U	N	3500 U	3600 U	N	N	N	N	N	N
Naphthalene	3.6%	88	13,000	0	800 U	2900 U	730 U	N	730 U	750 U	N	88 J	400 U	N	400 U	400 U
2-Methylnaphthalene	3.6%	52	36,400	0	800 U	2900 U	730 U	N	730 U	750 U	N	52 J	400 U	N	400 U	400 U
2-Chloronaphthalene	0.0%	0	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	620 U	400 U	N	400 U	400 U
2-Nitroaniline	0.0%	0	430 or MDL	0	3900 U	14000 U	3500 U	N	3500 U	3600 U	N	1500 U	980 U	N	980 U	980 U
Acenaphthylene	3.6%	42	41,000	0	800 U	2900 U	730 U	N	730 U	750 U	N	42 J	400 U	N	400 U	400 U
2,6-Dinitrotoluene	21.4%	2000	1000	1	800 U	2000 J	730 U	N	150 J	100 J	N	620 U	400 U	N	400 U	400 U
3-Nitroaniline	0.0%	0	500 or MDL	0	3900 U	14000 U	3500 U	N	3500 U	3600 U	N	1500 U	980 U	N	980 U	980 U
Acenaphthene	3.6%	270	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	270 J	400 U	N	400 U	400 U
Dibenzofuran	3.6%	140	6200	0	800 U	2900 U	730 U	N	730 U	750 U	N	140 J	400 U	N	400 U	400 U
2,4-Dinitrotoluene	42.9%	33000	50,000*	0	800 U	33000	730 U	N	2800	2500	N	290 J	400 U	N	400 U	400 U
Diethylphthalate	3.6%	22	7100	0	800 U	2900 U	730 U	N	730 U	750 U	N	620 U	400 U	N	400 U	400 U
Fluorene	3.6%	210	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	210 J	400 U	N	400 U	400 U
N-Nitrosodiphenylamine (1)	32.1%	7000	50,000*	0	800 U	7000	730 U	N	530 J	270 J	N	500 J	400 U	N	400 U	400 U
Hexachlorobenzene	0.0%	0	410	0	800 U	2900 U	730 U	N	730 U	750 U	N	620 U	400 U	N	400 U	400 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	3900 U	14000 U	3500 U	N	3500 U	3600 U	N	1500 U	980 U	N	980 U	980 U
Phenanthrene	14.3%	2600	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	2600	14 J	N	400 U	400 U
Anthracene	3.6%	440	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	440 J	400 U	N	400 U	400 U
Carbazole	11.1%	1000	50,000*	0	N	N	N	N	N	N	N	1000	400 U	N	400 U	400 U
Di-n-butylphthalate	28.6%	5800	8100	0	800 U	730 J	730 U	N	730 U	140 J	N	130 J	13 J	N	400 U	400 U
Fluoranthene	17.9%	4400	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	4400	22 J	N	400 U	400 U
Pyrene	17.9%	5600	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	5600 J	17 J	N	400 U	400 U
Butylbenzylphthalate	0.0%	0	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	620 U	400 U	N	400 U	400 U
Benzo(a)anthracene	10.7%	3900	220 or MDL	2	800 U	2900 U	730 U	N	730 U	750 U	N	3900	400 U	N	400 U	400 U
Chrysene	10.7%	8900	400	1	800 U	2900 U	730 U	N	730 U	750 U	N	8900 J	400 U	N	400 U	400 U
bis(2-Ethylhexyl)phthalate	28.6%	420	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	360 J	42 J	N	400 U	30 J
Di-n-octylphthalate	0.0%	0	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	620 U	400 U	N	400 U	400 U
Benzo(b)fluoranthene	17.9%	11000	1100	1	800 U	2900 U	730 U	N	730 U	750 U	N	11000 J	14 J	N	400 U	400 U
benzo(k)fluoranthene	10.7%	4500	1100	1	800 U	2900 U	730 U	N	730 U	750 U	N	4500	400 U	N	400 U	400 U
Benzo(a)pyrene	10.7%	3700	61 or MDL	2	800 U	2900 U	730 U	N	730 U	750 U	N	3700	400 U	N	400 U	400 U
Indeno(1,2,3-cd)pyrene	7.1%	2300	3200	0	800 U	2900 U	730 U	N	730 U	750 U	N	2300	400 U	N	400 U	400 U
Dibenz(a,h)anthracene	3.6%	290	14 or MDL	1	800 U	2900 U	730 U	N	730 U	750 U	N	290 J	400 U	N	400 U	400 U
Benzo(g,h,i)perylene	10.7%	810	50,000*	0	800 U	2900 U	730 U	N	730 U	750 U	N	810	400 U	N	400 U	400 U

TABLE 2-7

PAD G
SUMMARY OF COMPOUNDS DETECTED
GEOPHYS. ANOMALY EXCAVATIONS, BERM EXCAVATIONS, AND PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GAE-G 2.0' 12/11/91 GAE-G-1	GAE-G 2.0' 12/11/91 GAE-G-2	PAD G 2.5' 12/04/91 BE-G-1-91	PAD-G 2.5' 12/04/91 BE-G-1-91RE	PAD G 4.0' 12/05/91 BE-G-2-91	PAD G 4.5' 12/05/91 BE-G-3-91	PAD-G 3.0' 12/05/91 BE-G-6-91	OB 2.0 feet 12/04/92 BE-G-11	OB 2.0 feet 12/07/92 BE-G-13	OB 2.0 feet 12/07/92 BE-G13RE	OB 2.0 feet 12/07/92 BE-G-14	OB 2.0 feet 12/07/92 BE-G14RE
Pesticides/PCBs (ug/kg)																
beta-BHC	0.0%	0	200	0	20 U	18 U	18 U	N	18 U	18 U	N	21 U	2.1 U	2.1 U	2 U	N
delta-BHC	0.0%	0	300	0	20 U	18 U	18 U	N	18 U	18 U	N	21 U	2.1 U	2.1 U	2 U	N
gamma-BHC (Lindane)	0.0%	0	60	0	20 U	18 U	18 U	N	18 U	18 U	N	21 U	2.1 U	2.1 U	2 U	N
Heptachlor	0.0%	0	100	0	20 U	18 U	18 U	N	18 U	18 U	N	21 U	2.1 U	2.1 U	2 U	N
Aldrin	0.0%	0	41	0	20 U	18 U	18 U	N	18 U	18 U	N	21 U	2.1 U	2.1 U	2 U	N
Heptachlor epoxide	0.0%	0	20	0	20 U	18 U	18 U	N	18 U	18 U	N	21 U	2.1 U	2.1 U	2 U	N
Endosulfan I	0.0%	0	900	0	20 U	18 U	18 U	N	18 U	18 U	N	21 U	2.1 U	2.1 U	2 U	N
Dieldrin	0.0%	0	44	0	39 U	36 U	35 U	N	35 U	36 U	N	41 U	4.1 U	4.1 U	4 U	N
4,4'-DDE	14.3%	32	2100	0	39 U	36 U	35 U	N	35 U	36 U	N	32 J	4.1 U	2.7 J	3.8 J	N
Endrin	0.0%	0	100	0	39 U	36 U	35 U	N	35 U	36 U	N	41 U	4.1 U	4.1 U	4 U	N
Endosulfan II	0.0%	0	900	0	39 U	36 U	35 U	N	35 U	36 U	N	41 U	4.1 U	4.1 U	4 U	N
4,4'-DDD	0.0%	0	2900	0	39 U	36 U	35 U	N	35 U	36 U	N	41 U	4.1 U	4.1 U	4 U	N
Endosulfan sulfate	0.0%	0	1000	0	39 U	36 U	35 U	N	35 U	36 U	N	41 U	4.1 U	4.1 U	4 U	N
4,4'-DDT	14.3%	92	2100	0	39 U	36 U	35 U	N	35 U	36 U	N	92 J	4.1 U	3.7 J	4.4 J	N
EndrinAldehyde	0.0%	0		NA	N	N	N	N	N	N	N	41 U	4.1 U	4.1 U	4 U	N
alpha-Chlordane	3.6%	3.5	540	0	200 U	180 U	180 U	N	180 U	180 U	N	21 U	2.1 U	2.1 U	2 U	N
Aroclor-1254	0.0%	0	1000	0	390 U	360 U	350 U	N	350 U	360 U	N	410 U	41 U	41 U	40 U	N
Aroclor-1260	0.0%	0	1000	0	390 U	360 U	350 U	N	350 U	360 U	N	410 U	41 U	41 U	40 U	N
Explosives (ug/kg)																
HMX	7.1%	1300		NA	1000 U	1000 U	1100 UJ	960 UJ	980 U	930 U	N	120 U	120 U	N	120 U	N
RDX	14.3%	4800		NA	120 U	120 U	83 J	120 UJ	120 U	120 U	N	120 U	120 U	N	120 U	N
1,3,5-Trinitrobenzene	35.7%	3900		NA	120 U	120 U	127 J	86 J	3900	350	N	170	120 U	N	120 U	N
1,3-Dinitrobenzene	3.6%	160		NA	120 U	120 U	140 UJ	120 UJ	160	120 U	N	120 U	120 U	N	120 U	N
Tetryl	0.0%	0		NA	400 U	400 U	450 UJ	380 UJ	390 U	370 U	N	120 U	120 U	N	120 U	N
2,4,6-Trinitrotoluene	17.9%	2100		NA	120 U	120 U	140 UJ	150 J	2100	760	N	120 U	120 U	N	120 U	N
4-amino-2,6-Dinitrotoluene	35.7%	1300		NA	120 U	120 U	710 J	370 J	1300	300	N	70 J	120 U	N	120 U	N
2-amino-4,6-Dinitrotoluene	35.7%	1800		NA	120 U	120 U	880 J	480 J	1800	320	N	110 J	120 U	N	120 U	N
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	140 UJ	120 UJ	120 U	120 U	N	120 U	120 U	N	120 U	N
2,4-Dinitrotoluene	67.9%	4000		NA	120 U	4000	100 J	78 J	670	800	N	260	120 U	N	120 U	N
Metals (mg/kg)																
Aluminum	100.0%	38900	17503.0	17	20400	14100	N	N	20700	21100	38900	26100	15000	N	13000	N
Antimony	18.5%	13.6	5	5	12.5 U R	30 R	N	N	115 R	35.7 R	8.7 R	23 R	6 U R	N	12.8 R	N
Arsenic	92.6%	20	7.5	2	6 J	6.1 J	N	N	20	11.7 R	0.86 R	8 J	6.2 J	N	5.6 J	N
Barium	88.9%	4740	300	10	190 J	270 J	N	N	4740	1400	2890	1650	206	N	191	N
Beryllium	29.6%	0.97	1	0	1.2 R	0.78 R	N	N	0.87 R	1 R	0.99 R	0.65	0.82	N	0.77	N
Cadmium	85.2%	27.9	1.8	20	3.3	4.7	N	N	6.9 J	9 J	27.9	26	0.52 J	N	0.73	N
Calcium	100.0%	138000	46825.0	3	4350 J	4810 J	N	N	14800	18000	30000	41900	9190	N	7140	N
Chromium	88.9%	1430	26.6	15	28.6	1430	N	N	32.2 R	71 R	87.8 R	109	24.4	N	20.7	N
Cobalt	100.0%	15.4	30	0	11.5	9.1	N	N	12.2	11.9	11.2	12.7	12.1	N	11.2	N
Copper	81.5%	15500	25	21	21.6 J	316 J	N	N	5300	632	998	918	66.1	N	69.2	N
Iron	100.0%	48800	32698.0	10	27000 J	32800 J	N	N	34200	35200	29700	36200	28600	N	23700	N
Lead	88.9%	22400	30	21	18	390 J	N	N	22400 J	7800 J	8710 J	5450	249 J	N	5250 J	N
Magnesium	100.0%	10900	9071.1	6	4580	3520	N	N	9910	6080	8230	9540	5200	N	4140	N
Manganese	100.0%	948	1065.8	0	705	710	N	N	662	947	584	602	557	N	513	N
Mercury	44.4%	0.42	0.1	4	0.08 J	0.04 J	N	N	0.19 J	0.42 J	0.1 J	0.06 J	0.12 J	N	0.13	N
Nickel	100.0%	64.5	41.3	8	33.1	20.1	N	N	39.9	33.9	64.5	57.7	33.1	N	28.2	N
Potassium	100.0%	3430	1529.6	18	3160	1890	N	N	2100 J	3430 J	2680 J	2530	1120	N	974	N
Selenium	55.6%	3.3	2	2	0.25 J	0.77 J	N	N	1.9 R	0.17 R	0.12 R	0.92 J	1.4 J	N	1.2 J	N
Silver	37.0%	15.3	0.6	5	2 U	0.86 U	N	N	2.1 R	1.2 R	15.3	3.7	0.35 U	N	0.57 J	N
Sodium	88.9%	618	76	23	141 J	318 J	N	N	368 J	235 J	516 J	656 R	54.2 R	N	39.9 R	N
Thallium	14.8%	0.59	0.3	4	0.5 U	0.35 U	N	N	0.35 U	0.35 U	0.39 U	0.49 U	0.57 U	N	0.46 U	N
Vanadium	96.3%	41.4	150	0	31	25.7	N	N	26.9	33.8	41.4	35.6	25.8	N	22.7	N
Zinc	100.0%	6380	89.1	26	108 J	637 J	N	N	1650	862	5300	4040	281	N	239	N
Cyanide	0.0%	0	NA	NA	0.55 U	0.59 U	N	N	0.64 U	0.64 U	0.7 U	0.72 U	0.75 U	N	0.73 U	N

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TABLE 2-7

PAD G
SUMMARY OF COMPOUNDS DETECTED
GEOPHYS. ANOMALY EXCAVATIONS, BERM EXCAVATIONS, AND PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD G 0-6" 01/08/92 PBG-1-1	PAD G 0-6" 01/08/92 PBG-1-1RE	PAD G 2-4' 01/08/92 PBG-1-3	PAD G 0-6" 01/09/92 PBG-2-1	PAD G 0-2' 01/09/92 PBG-2-2	PAD G 0-6" 01/09/92 PBG-3-1	PAD G 0-2' 01/09/92 PBG-3-2	PAD G 0-6" 01/09/92 PBG-4-1	PAD G 0-2' 01/09/92 PBG-4-2	PAD G 0-6" 01/10/92 PBG-5-1	PAD G 0-2' 01/10/92 PBG-5-2	PAD G 2-4' 01/10/92 PBG-5-3
VOCs (ug/kg)																
Methylene Chloride	3.3%	2	100	0	9 U J	8 U J	6 U	7 U	7 U	6 U	6 U	6 U	6 U	6 U	N	6 U
Acetone	0.0%	0	200	0	13 U J	13 U J	12 U	11 U	13 U	12 U	12 U	13 U	12 U	12 U	N	12 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U J	6 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N	6 U
Chloroform	20.0%	12	300	0	12 J	9 J	6 U	6	6 U	10	6 U	6 U	6 U	6 U	N	6 U
2-Butanone	0.0%	0	300	0	13 U J	13 U J	12 U	11 U	13 U	12 U	12 U	13 U	12 U	12 U	N	12 U
1,1,1-Trichloroethane	3.3%	2	800	0	6 U J	6 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N	6 U
Carbon Tetrachloride	0.0%	0	600	0	6 U J	6 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N	6 U
Trichloroethene	3.3%	1	700	0	6 U J	6 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N	6 U
Benzene	0.0%	0	60	0	6 U J	6 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N	6 U
Tetrachloroethene	10.0%	15	1400	0	6 U J	6 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N	6 U
Toluene	6.7%	2	1500	0	6 U J	6 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N	6 U
Chlorobenzene	0.0%	0	1700	0	6 U J	6 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N	6 U
Xylene (total)	0.0%	0	1200	0	6 U J	6 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N	6 U
Semivolatiles (ug/kg)																
Phenol	0.0%	0	30 or MDL	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
2-Methylphenol	0.0%	0	100 or MDL	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
4-Methylphenol	0.0%	0	900	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
2,4-Dimethylphenol	0.0%	0	50,000*	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Benzoic acid	5.3%	98	2700	0	3800 U	N	3800 U	3900 U	3600 U	3900 U	3700 U	4100 U	3800 U	3800 U	3800 U	N
Naphthalene	3.6%	88	13,000	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
2-Methylnaphthalene	3.6%	52	36,400	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
2-Chloronaphthalene	0.0%	0	50,000*	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
2-Nitroaniline	0.0%	0	430 or MDL	0	3800 U	N	3800 U	3900 U	3600 U	3900 U	3700 U	4100 U	3800 U	3800 U	3800 U	N
Acenaphthylene	3.6%	42	41,000	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
2,6-Dinitrotoluene	21.4%	2000	1000	1	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	86 J	N
3-Nitroaniline	0.0%	0	500 or MDL	0	3800 U	N	3800 U	3900 U	3600 U	3900 U	3700 U	4100 U	3800 U	3800 U	3800 U	N
Acenaphthene	3.6%	270	50,000*	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Dibenzofuran	3.6%	140	6200	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
2,4-Dinitrotoluene	42.9%	33000	50,000*	0	790 U	N	780 U	800 U	81 J	810 U	770 U	840 U	790 U	510 J	1300	N
Diethylphthalate	3.6%	22	7100	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Fluorene	3.6%	210	50,000*	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
N-Nitrosodiphenylamine (1)	32.1%	7000	50,000*	0	790 U	N	780 U	190 J	750 U	810 U	770 U	840 U	790 U	780 U	280 J	N
Hexachlorobenzene	0.0%	0	410	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Pentachlorophenol	0.0%	0	1000 or MDL	0	3800 U	N	3800 U	3900 U	3600 U	3900 U	3700 U	4100 U	3800 U	3800 U	3800 U	N
Phenanthrene	14.3%	2600	50,000*	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Anthracene	3.6%	440	50,000*	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Carbazole	11.1%	1000	50,000*	0	N	N	N	N	N	N	N	N	N	N	N	N
Di-n-butylphthalate	28.6%	5800	8100	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Fluoranthene	17.9%	4400	50,000*	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Pyrene	17.9%	5600	50,000*	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Butylbenzylphthalate	0.0%	0	50,000*	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Benzo(a)anthracene	10.7%	3900	220 or MDL	2	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Chrysene	10.7%	8900	400	1	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
bis(2-Ethylhexyl)phthalate	28.6%	420	50,000*	0	790 U	N	200 J	800 U	420 J	810 U	770 U	840 U	790 U	780 U	790 U	N
Di-n-octylphthalate	0.0%	0	50,000*	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Benzo(b)fluoranthene	17.9%	11000	1100	1	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
benzo(k)fluoranthene	10.7%	[illegible]	1100	1	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Benzo(a)pyrene	10.7%	[illegible]	61 or MDL	2	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Indeno(1,2,3-cd)pyrene	7.1%	2300	3200	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Dibenz(a,h)anthracene	3.6%	290	14 or MDL	1	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N
Benzo(g,h,i)perylene	10.7%	810	50,000*	0	790 U	N	780 U	800 U	750 U	810 U	770 U	840 U	790 U	780 U	790 U	N

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TABLE 2-7

PAD G
SUMMARY OF COMPOUNDS DETECTED
GEOPHYS. ANOMALY EXCAVATIONS, BERM EXCAVATIONS, AND PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD G 0-6" 01/08/92 PBG-1-1	PAD G 0-6" 01/08/92 PBG-1-1RE	PAD G 2-4' 01/08/92 PBG-1-3	PAD G 0-6" 01/09/92 PBG-2-1	PAD G 0-2' 01/09/92 PBG-2-2	PAD G 0-6" 01/09/92 PBG-3-1	PAD G 0-2' 01/09/92 PBG-3-2	PAD G 0-6" 01/09/92 PBG-4-1	PAD G 0-2' 01/09/92 PBG-4-2	PAD G 0-6" 01/10/92 PBG-5-1	PAD G 0-2' 01/10/92 PBG-5-2	PAD G 2-4' 01/10/92 PBG-5-3
Pesticides/PCBs (ug/kg)																
beta-BHC	0.0%	0	200	0	19 U	N	19 U	19 U	18 U	20 U	19 U	20 U	19 U	19 U	19 U	N
delta-BHC	0.0%	0	300	0	19 U	N	19 U	19 U	18 U	20 U	19 U	20 U	19 U	19 U	19 U	N
gamma-BHC (Lindane)	0.0%	0	60	0	19 U	N	19 U	19 U	18 U	20 U	19 U	20 U	19 U	19 U	19 U	N
Heptachlor	0.0%	0	100	0	19 U	N	19 U	19 U	18 U	20 U	19 U	20 U	19 U	19 U	19 U	N
Aldrin	0.0%	0	41	0	19 U	N	19 U	19 U	18 U	20 U	19 U	20 U	19 U	19 U	19 U	N
Heptachlor epoxide	0.0%	0	20	0	19 U	N	19 U	19 U	18 U	20 U	19 U	20 U	19 U	19 U	19 U	N
Endosulfan I	0.0%	0	900	0	19 U	N	19 U	19 U	18 U	20 U	19 U	20 U	19 U	19 U	19 U	N
Dieldrin	0.0%	0	44	0	38 U	N	38 U	39 U	36 U	39 U	37 U	41 U	38 U	38 U	38 U	N
4,4'-DDE	14.3%	32	2100	0	38 U	N	38 U	39 U	36 U	39 U	37 U	41 U	38 U	38 U	38 U	N
Endrin	0.0%	0	100	0	38 U	N	38 U	39 U	36 U	39 U	37 U	41 U	38 U	38 U	38 U	N
Endosulfan II	0.0%	0	900	0	38 U	N	38 U	39 U	36 U	39 U	37 U	41 U	38 U	38 U	38 U	N
4,4'-DDD	0.0%	0	2900	0	38 U	N	38 U	39 U	36 U	39 U	37 U	41 U	38 U	38 U	38 U	N
Endosulfan sulfate	0.0%	0	1000	0	38 U	N	38 U	39 U	36 U	39 U	37 U	41 U	38 U	38 U	38 U	N
4,4'-DDT	14.3%	92	2100	0	33 J	N	38 U	39 U	36 U	39 U	37 U	41 U	38 U	38 U	38 U	N
EndrinAldehyde	0.0%	0		NA	N	N	N	N	N	N	N	N	N	N	N	N
alpha-Chlordane	3.6%	3.5	540	0	190 U	N	190 U	190 U	180 U	200 U	190 U	200 U	190 U	190 U	190 U	N
Aroclor-1254	0.0%	0	1000	0	380 U	N	380 U	390 U	360 U	390 U	370 U	410 U	380 U	380 U	380 U	N
Aroclor-1260	0.0%	0	1000	0	380 U	N	380 U	390 U	360 U	390 U	370 U	410 U	380 U	380 U	380 U	N
Explosives (ug/kg)																
HMX	7.1%	1300		NA	980 J	N	1000 U	1300	1000 U	1000 U	1000 U	1000 U J	1000 U	1000 U J	1000 U	N
RDX	14.3%	4800		NA	2900	N	120 U	4800	170 J	120 U	120 U	120 U J	120 U	120 U J	120 U	N
1,3,5-Trinitrobenzene	35.7%	3900		NA	250	N	210	260	120 U	120 U	120 U	120 U J	120 U	120 U J	120 U	N
1,3-Dinitrobenzene	3.6%	160		NA	120 U	N	120 U	120 U	120 U	120 U	120 U	120 U J	120 U	120 U J	120 U	N
Tetryl	0.0%	0		NA	400 U	N	400 U	400 U	400 U	400 U	400 U	400 U J	400 U	400 U J	400 U	N
2,4,6-Trinitrotoluene	17.9%	2100		NA	390	N	290	120 U	120 U	120 U	120 U	120 U J	120 U	120 U J	120 U	N
4-amino-2,6-Dinitrotoluene	35.7%	1300		NA	600	N	270	250	120 U	120 U	120 U	120 U J	120 U	120 U J	120 U	N
2-amino-4,6-Dinitrotoluene	35.7%	1800		NA	480	N	530	150	120 U	120 U	120 U	120 U J	120 U	120 U J	120 U	N
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	N	120 U	120 U	120 U	120 U	120 U	120 U J	120 U	120 U J	120 U	N
2,4-Dinitrotoluene	67.9%	4000		NA	180	N	110 J	240	300	76 J	120 U	120 U J	120 U	120 U J	120 U	N
Metals (mg/kg)																
Aluminum	100.0%	38900	17503.0	17	22500	N	18500	9370	14200	18900	18200	18000	21200	18100	19200	N
Antimony	18.5%	13.6	5	5	6 UJ	N	13.6 J	6 UJ	5.6 UJ	5.8 UJ	7.4 J	6.7 UJ	6.2 UJ	6 UJ	5.9 UJ	N
Arsenic	92.6%	20	7.5	2	4 J	N	9 J	4.7 J	3.7 J	6 J	5.7 J	5.2 J	5.1 J	4.6 J	4.4 J	N
Barium	88.9%	4740	300	10	709	N	1390	422	481	554	233	157	134	167	161	N
Beryllium	29.6%	0.97	1	0	0.64 R	N	0.99 R	0.56 R	0.82 R	0.91 R	0.94 R	0.88 R	0.86 R	0.86 R	0.91 R	N
Cadmium	85.2%	27.9	1.8	20	11.3	N	4.3	9.6	9.2	6.7	4.2	20.7	3.4	5.9	3.1	N
Calcium	100.0%	138000	46825.0	3	92100	N	6310	138000	34400	23000	6040	26200	3410	4080	5170	N
Chromium	88.9%	1430	26.6	15	37.3 J	N	30.5 J	24.4 J	26.5 J	41.4 J	29.4 J	25.6 J	28.5 J	21 J	23.9 J	N
Cobalt	100.0%	15.4	30	0	10.7	N	13.7	7.4	12.5	13.4	15.3	12.3	12.1	11	12.2	N
Copper	81.5%	15500	25	21	466	N	1650	108	75.4	688	46.3	80.8	27	28	37.8	N
Iron	100.0%	48800	32698.0	10	35800	N	37400	25700	28500	32700	30300	26500	31400	21200	22400	N
Lead	88.9%	22400	30	21	509	N	3360	203	7.7	212	65.7	639	43.3 R	88.5	50.2 R	N
Magnesium	100.0%	10900	9071.1	6	7720	N	6730	10700	9650	6720	5640	5050	4660	3680	3970	N
Manganese	100.0%	948	1065.8	0	505	N	618	359	610	799	948	693	736	750	826	N
Mercury	44.4%	0.42	0.1	4	0.15 R	N	0.15 R	0.1 R	0.2 R	0.13 R	0.13 R	0.17 R	0.19 R	0.28 R	0.29 R	N
Nickel	100.0%	64.5	41.3	8	48.2 J	N	43.2 J	34.8 J	35.5 J	39.9 J	53.5 J	30.7 J	29.1 J	19.8 J	22.4 J	N
Potassium	100.0%	3430	1529.6	18	1650 J	N	1500 J	1410 J	1730 J	2450 J	1630 J	1810 J	2160 J	1680 J	1890 J	N
Selenium	55.6%	3.3	2	2	1.2	N	0.27 J	0.28 J	0.35 J	0.3 J	0.14 U	0.19 U	0.22 U	0.38 J	0.97 U	N
Silver	37.0%	15.3	0.6	5	1.2	N	2.9	0.99 J	0.59 J	0.37 J	0.36 U	0.56 J	0.39 U	0.39 U	0.38 U	N
Sodium	88.9%	618	76	23	385 J	N	130 J	324 J	344 J	151 J	92.6 J	129 J	128 J	83.1 J	115 J	N
Thallium	14.8%	0.59	0.3	4	0.51 U	N	0.46 U	0.39 U	0.49 U	0.62 U	0.34 U	0.48 J	0.52 U	0.51 U	0.46 U	N
Vanadium	96.3%	41.4	150	0	20.2	N	25.8	16.9 R	21.6	27.8	27.2	25.4	30.3	25.9	27.1	N
Zinc	100.0%	6380	89.1	26	1600	N	615	740	297	585	172	216	93.1	127	129	N
Cyanide	0.0%	0	NA	NA	0.55 U	N	0.64 U	0.7 U	0.62 U	0.6 U	0.66 U	0.62 U	0.68 U	0.64 U	0.67 U	N

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TABLE 2-7

PAD G
SUMMARY OF COMPOUNDS DETECTED
GEOPHYS. ANOMALY EXCAVATIONS, BERM EXCAVATIONS, AND PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD G 0-6" 01/13/92 PBG-6-1	PAD G 4'+ 01/13/92 PBG-6-4	PAD G 4'+ 01/13/13 PBG-6-4RE	PAD G 0-6" 01/13/92 PBG-7-1	PAD G 0-6" 01/13/92 PBG-7-1RE	PAD G 0-2' 01/13/92 PBG-7-2	OB 0-2 01/14/93 PBG-8-1	OB 2-4 01/14/93 PBG-8-2	OB 4-6 01/14/93 PBG-8-3	OB 0-2 01/14/93 PBG-8-6	OB 0-2 01/12/93 PBG-9-1	OB 2-4 01/12/93 PBG-9-2
VOCs (ug/kg)																
Methylene Chloride	3.3%	2	100	0	6 U	6 U J	12 U	6 U J	11 U J	6 U	12 U	N	11 U	12 U	2 J	12 U
Acetone	0.0%	0	200	0	12 U	11 U J	11 U	11 U J	11 U J	12 U	12 U	N	11 U	12 U	13 U	12 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U	6 U J	6 U	6 U J	6 U J	6 U	12 U	N	11 U	12 U	13 U	12 U
Chloroform	20.0%	12	300	0	6 U	6 U J	6 U	6 U J	1 J	6 U	12 U	N	11 U	12 U	13 U	12 U
2-Butanone	0.0%	0	300	0	12 U	11 U J	11 U	11 U J	11 U J	12 U	12 U	N	11 U	12 U	13 U	12 U
1,1,1-Trichloroethane	3.3%	2	800	0	6 U	6 U J	6 U	6 U J	6 U J	2 J	12 U	N	11 U	12 U	13 U	12 U
Carbon Tetrachloride	0.0%	0	600	0	6 U	6 U J	6 U	6 U J	6 U J	6 U	12 U	N	11 U	12 U	13 U	12 U
Trichloroethene	3.3%	1	700	0	6 U	6 U J	6 U	6 U J	6 U J	6 U	12 U	N	11 U	12 U	13 U	12 U
Benzene	0.0%	0	60	0	6 U	6 U J	6 U	6 U J	6 U J	6 U	12 U	N	11 U	12 U	13 U	12 U
Tetrachloroethene	10.0%	15	1400	0	6 U	6 U J	6 U	6 U J	6 U J	6 U	12 U	N	11 U	12 U	13 U	12 U
Toluene	6.7%	2	1500	0	6 U	6 U J	6 U	6 U J	6 U J	6 U	12 U	N	11 U	12 U	13 U	2 J
Chlorobenzene	0.0%	0	1700	0	6 U	6 U J	6 U	6 U J	6 U J	6 U	12 U	N	11 U	12 U	13 U	12 U
Xylene (total)	0.0%	0	1200	0	6 U	6 U J	6 U	6 U J	6 U J	6 U	12 U	N	11 U	12 U	13 U	12 U
Semivolatiles (ug/kg)																
Phenol	0.0%	0	30 or MDL	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
2-Methylphenol	0.0%	0	100 or MDL	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
4-Methylphenol	0.0%	0	900	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
Benzoic acid	5.3%	98	2700	0	98 J	3700 U	N	3600 U	N	3500 U	N	N	N	N	N	N
Naphthalene	3.6%	88	13,000	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
2-Methylnaphthalene	3.6%	52	36,400	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
2-Chloronaphthalene	0.0%	0	50,000*	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
2-Nitroaniline	0.0%	0	430 or MDL	0	3800 U	3700 U	N	3600 U	N	3500 U	970 U	960 U	N	3000 U	860 U	930 U
Acenaphthylene	3.6%	42	41,000	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
2,6-Dinitrotoluene	21.4%	2000	1000	1	780 U	760 U	N	740 U	N	150 J	400 U	390 U	N	380 J	360 U	380 U
3-Nitroaniline	0.0%	0	500 or MDL	0	3800 U	3700 U	N	3600 U	N	3500 U	970 U	960 U	N	3000 U	860 U	930 U
Acenaphthene	3.6%	270	50,000*	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
Dibenzofuran	3.6%	140	6200	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
2,4-Dinitrotoluene	42.9%	33000	50,000*	0	290 J	78 J	N	740 U	N	3600	170 J	390 U	N	6600 J	360 U	380 U
Diethylphthalate	3.6%	22	7100	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	22 J
Fluorene	3.6%	210	50,000*	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
N-Nitrosodiphenylamine (1)	32.1%	7000	50,000*	0	780 U	760 U	N	740 U	N	480 J	58 J	390 U	N	290 J	360 U	380 U
Hexachlorobenzene	0.0%	0	410	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	3800 U	3700 U	N	3600 U	N	3500 U	970 U	960 U	N	3000 U	860 U	930 U
Phenanthrene	14.3%	2600	50,000*	0	96 J	760 U	N	230 J	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
Anthracene	3.6%	440	50,000*	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
Carbazole	11.1%	1000	50,000*	0	N	N	N	N	N	N	400 U	390 U	N	1200 U	360 U	380 U
Di-n-butylphthalate	28.6%	5800	8100	0	780 U	760 U	N	320 J	N	720 U	21 J	28 J	N	5800 J	360 U	380 U
Fluoranthene	17.9%	4400	50,000*	0	120 J	760 U	N	420 J	N	720 U	400 U	390 U	N	1200 U	13 J	380 U
Pyrene	17.9%	5600	50,000*	0	110 J	760 U	N	400 J	N	720 U	400 U	390 U	N	1200 U	13 J	380 U
Butylbenzylphthalate	0.0%	0	50,000*	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
Benzo(a)anthracene	10.7%	3900	220 or MDL	2	75 J	760 U	N	270 J	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
Chrysene	10.7%	8900	400	1	100 J	760 U	N	330 J	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
bis(2-Ethylhexyl)phthalate	28.6%	420	50,000*	0	780 U	760 U	N	740 U	N	720 U	210 J	210 J	N	230 J	360 U	380 U
Di-n-octylphthalate	0.0%	0	50,000*	0	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
Benzo(b)fluoranthene	17.9%	11000	1100	1	120 J	760 U	N	400 J	N	720 U	400 U	390 U	N	1200 U	17 J	380 U
benzo(k)fluoranthene	10.7%	4500	1100	1	75 J	760 U	N	210 J	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
Benzo(a)pyrene	10.7%	3700	61 or MDL	2	780 U	760 U	N	230 J	N	720 U	400 U	390 U	N	1200 U	14 J	380 U
Indeno(1,2,3-cd)pyrene	7.1%	2300	3200	0	780 U	760 U	N	180 J	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
Dibenz(a,h)anthracene	3.6%	290	14 or MDL	1	780 U	760 U	N	740 U	N	720 U	400 U	390 U	N	1200 U	360 U	380 U
Benzo(g,h,i)perylene	10.7%	810	50,000*	0	780 U	760 U	N	210 J	N	720 U	400 U	390 U	N	1200 U	120 J	380 U

TABLE 2-7

PAD G
SUMMARY OF COMPOUNDS DETECTED
GEOPHYS. ANOMALY EXCAVATIONS, BERM EXCAVATIONS, AND PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD G 0-6" 01/13/92 PBG-6-1	PAD G 4'+ 01/13/92 PBG-6-4	PAD G 4'+ 01/13/13 PBG-6-4RE	PAD G 0-6" 01/13/92 PBG-7-1	PAD G 0-6" 01/13/92 PBG-7-1RE	PAD G 0-2' 01/13/92 PBG-7-2	OB 0-2 01/14/93 PBG-8-1	OB 2-4 01/14/93 PBG-8-2	OB 4-6 01/14/93 PBG-8-3	OB 0-2 01/14/93 PBG-8-6	OB 0-2 01/12/93 PBG-9-1	OB 2-4 01/12/93 PBG-9-2
Pesticides/PCBs (ug/kg)																
beta-BHC	0.0%	0	200	0	19 U	19 U	N	18 U	N	17 U	2.1 U	2 U	N	2 U	1.9 U	2 U
delta-BHC	0.0%	0	300	0	19 U	19 U	N	18 U	N	17 U	2.1 U	2 U	N	2 U	1.9 U	2 U
gamma-BHC (Lindane)	0.0%	0	60	0	19 U	19 U	N	18 U	N	17 U	2.1 U	2 U	N	2 U	1.9 U	2 U
Heptachlor	0.0%	0	100	0	19 U	19 U	N	18 U	N	17 U	2.1 U	2 U	N	2 U	1.9 U	2 U
Aldrin	0.0%	0	41	0	19 U	19 U	N	18 U	N	17 U	2.1 U	2 U	N	2 U	1.9 U	2 U
Heptachlor epoxide	0.0%	0	20	0	19 U	19 U	N	18 U	N	17 U	2.1 U	2 U	N	2 U	1.9 U	2 U
Endosulfan I	0.0%	0	900	0	19 U	19 U	N	18 U	N	17 U	2.1 U	2 U	N	2 U	1.9 U	2 U
Dieldrin	0.0%	0	44	0	38 U	37 U	N	36 U	N	35 U	4.1 U	3.9 U	N	3.8 U	3.6 U	3.8 U
4,4'-DDE	14.3%	32	2100	0	38 U	37 U	N	36 U	N	35 U	4.1 U	3.9 U	N	3.8 U	1.9 J	3.8 U
Endrin	0.0%	0	100	0	38 U	37 U	N	36 U	N	35 U	4.1 U	3.9 U	N	3.8 U	3.6 U	3.8 U
Endosulfan II	0.0%	0	900	0	38 U	37 U	N	36 U	N	35 U	4.1 U	3.9 U	N	3.8 U	3.6 U	3.8 U
4,4'-DDD	0.0%	0	2900	0	38 U	37 U	N	36 U	N	35 U	4.1 U	3.9 U	N	3.8 U	3.6 U	3.8 U
Endosulfan sulfate	0.0%	0	1000	0	38 U	37 U	N	36 U	N	35 U	4.1 U	3.9 U	N	3.8 U	3.6 U	3.8 U
4,4'-DDT	14.3%	92	2100	0	38 U	37 U	N	36 U	N	35 U	4.1 U	3.9 U	N	3.8 U	3.6 U	3.8 U
EndrinAldehyde	0.0%	0		NA	N	N	N	N	N	N	4.1 U	3.9 U	N	3.8 U	3.6 U	3.8 U
alpha-Chlordane	3.6%	3.5	540	0	190 U	190 U	N	180 U	N	170 U	2.1 U	2 U	N	2 U	3.5 J	2 U
Aroclor-1254	0.0%	0	1000	0	380 U	370 U	N	360 U	N	350 U	41 U	39 U	N	38 U	36 U	38 U
Aroclor-1260	0.0%	0	1000	0	380 U	370 U	N	360 U	N	350 U	41 U	39 U	N	38 U	36 U	38 U
Explosives (ug/kg)																
HMX	7.1%	1300		NA	1000 U	1000 U	N	1000 U	N	1000 U	120 U	120 U	N	120 U	120 U	120 U
RDX	14.3%	4800		NA	120 U	120 U	N	120 U	N	120 U	120 U	120 U	N	120 U	120 U	120 U
1,3,5-Trinitrobenzene	35.7%	3900		NA	250	120 U	N	80 J	N	120 U	120 U	120 U	N	120 U	120 U	120 U
1,3-Dinitrobenzene	3.6%	160		NA	120 U	120 U	N	120 U	N	120 U	120 U	120 U	N	120 U	120 U	120 U
Tetryl	0.0%	0		NA	400 U	400 U	N	400 U	N	400 U	120 U	120 U	N	120 U	120 U	120 U
2,4,6-Trinitrotoluene	17.9%	2100		NA	120 U	120 U	N	120 U	N	120 U	120 U	120 U	N	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	35.7%	1300		NA	590	120 U	N	120 U	N	210	120 U	120 U	N	120 U	120 U	120 U
2-amino-4,6-Dinitrotoluene	35.7%	1800		NA	360	120 U	N	120 U	N	220	120 U	120 U	N	120 U	120 U	120 U
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	N	120 U	N	120 U	120 U	120 U	N	120 U	120 U	120 U
2,4-Dinitrotoluene	67.9%	4000		NA	1200	260	N	79 J	N	4000	3000 J	75 J	N	410 J	120 J	120 U
Metals (mg/kg)																
Aluminum	100.0%	38900	17503.0	17	13300	22800	N	24900	N	19600	18100	14600	N	14500	13300	14400
Antimony	18.5%	13.6	5	5	5.8 UJ	6.2 UJ	N	6.1 J	N	9.8 J	6.2 UJ	5.8 UJ	N	9.1 J	5.7 UJ	6 UJ
Arsenic	92.6%	20	7.5	2	5.3	3.9	N	6.8	N	3.7	5 J	4 J	N	4.6 J	6.2 J	4.7 J
Barium	88.9%	4740	300	10	511 R	354 R	N	1860	N	366 R	155	114	N	163	141	122
Beryllium	29.6%	0.97	1	0	0.75 R	1.1 R	N	0.88 R	N	1 R	0.97	0.69	N	0.65	0.74	0.72
Cadmium	85.2%	27.9	1.8	20	7.8 J	6.1 J	N	17 J	N	7.1 J	0.36 U	0.33 U	N	0.34 U	0.51 J	0.34 U
Calcium	100.0%	138000	46825.0	3	21200	12600	N	30200	N	25300	9770	52900	N	14100	14600	29400
Chromium	88.9%	1430	26.6	15	45.7 J	156 J	N	54.7 J	N	53.4 J	263	28.6	N	129	19.9	22.9
Cobalt	100.0%	15.4	30	0	11.4	15	N	15.1	N	15.4	13.6	11	N	12.5	10.5	11.9
Copper	81.5%	15500	25	21	439	162	N	15500	N	185	36.5 R	28.7 R	N	52.1 R	23.4 R	37.7 R
Iron	100.0%	48800	32698.0	10	23400	34600	N	48800	N	42900	28200	26200	N	24900	21600	26800
Lead	88.9%	22400	30	21	291	37.5 R	N	1700	N	332	64.3 J	23.8 J	N	145 J	24.4 J	38.1 J
Magnesium	100.0%	10900	9071.1	6	5630	7190	N	9300	N	8340	5530	10900	N	5220	4500	6080
Manganese	100.0%	948	1065.8	0	477	730	N	616	N	520	590	871	N	490	644	537
Mercury	44.4%	0.42	0.1	4	0.08 R	0.13 R	N	0.08 R	N	0.09 R	0.03 U	0.04 J	N	0.04 J	0.04 J	0.04 J
Nickel	100.0%	64.5	41.3	8	36	47.1	N	52.6	N	50.8	33.5	37.9	N	35.2	26.7	38.3
Potassium	100.0%	3430	1529.6	18	1990 J	3240 J	N	2580 J	N	2920 J	1470	1290	N	1420	1370	1260
Selenium	55.6%	3.3	2	2	2.1 J	0.18 UJ	N	3.3 J	N	0.7 J	0.26 UJ	0.23 UJ	N	0.2 UJ	0.41 J	0.14 UJ
Silver	37.0%	15.3	0.6	5	0.37 U	0.39 U	N	2	N	0.36 U	0.37 U	0.34 U	N	0.35 U	0.34 U	0.35 U
Sodium	88.9%	618	76	23	441 J	380 J	N	618	N	227 J	87.6 J	124 J	N	86.5 J	74 J	114 J
Thallium	14.8%	0.59	0.3	4	0.51 J	0.59 J	N	0.33 U	N	0.53 J	0.61 U	0.54 U	N	0.47 U	0.48 U	0.32 U
Vanadium	96.3%	41.4	150	0	18.7 J	30.4 J	N	29 J	N	27.2 J	28.6	22.3	N	22.6	22.3	22.3
Zinc	100.0%	6380	89.1	26	1560	799	N	6380	N	772	116 J	95.2 J	N	197 J	77.5 J	118 J
Cyanide	0.0%	0	NA	NA	0.58 U	0.69 U	N	0.62 U	N	0.65 U	0.74 U	0.69 U	N	0.7 U	0.66 U	0.71 U

NOTES:

a) * = As per proposed TAGM, Total VOCs <10 ppm, Total Semi-VOCs <500 ppm, Individual Semi-VOCs <50 ppm.
For certain metals, the TAGM is equal to the greater value between the proposed TAGM and site background.
The number of samples above the TAGM was determined by comparison to the actual number given, not the MDL.
b) The TAGM for 1,2-Dichloroethene (trans) was used for 1,2-Dichloroethene (total) since it was the only value available.
c) NA = not applicable
d) N = Compound was not analyzed.
e) U = Compound was not detected.
f) J = The reported value is an estimated concentration.
g) R = The data was rejected in the data validation process.
h) SB = Site background
i) MDL = Method detection limit

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TABLE 2-8

PAD H
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD H 4.0' 12/12/91 BE-H-2-91	PAD H 4.0' 12/10/91 BE-H-3-91	OB 2.0 feet 12/04/92 BE-H-5	PAD-H 0-6" 12/12/91 PBH-1-1	PAD-H 0-2' 12/12/91 PBH-1-2	PAD H 0-2' 12/12/91 PBH-1-2RE	OB 0-2' 01/14/93 PBH-2-1	OB 0-2' 01/14/93 PBH2-1RE	OB 2-4' 01/14/93 PBH-2-2	OB 0-2' 03/12/93 PBH-3-1	OB 0-2' 03/12/93 PBH3-1RE	OB 0-2' 03/12/93 PBH-4-1	OB 0-2' 03/12/93 PBH4-1RE	OB 0-2' 03/12/93 PBH-5-1	OB 0-2' 03/12/93 PBH-6-1
VOCs (ug/kg)																			
Methylene Chloride	0.0%	0	100	0	6 U	6 U	11 U	5 U	5 U J	5 U J	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 U
Acetone	6.7%	100	200	0	11 U	12 U	11 U	11 U	10 U J	18 U J	11 U	11 U	100	11 U	11 U	10 U	10 U	11 U	11 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U	6 U	11 U	5 U	5 U J	5 U J	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 U
Chloroform	6.7%	2	300	0	2 J	6 U	11 U	5 U	5 U J	5 U J	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 U
2-Butanone	6.7%	22	300	0	11 U	12 U	11 U	11 U	10 U J	10 U J	11 U	11 U	22	11 U	11 U	10 U	10 U	11 U	11 U
1,1,1-Trichloroethane	0.0%	0	800	0	6 U	6 U	11 U	5 U	5 U J	5 U J	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 U
Carbon Tetrachloride	0.0%	0	600	0	6 U	6 U	11 U	5 U	5 U J	5 U J	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 U
Trichloroethene	0.0%	0	700	0	6 U	6 U	11 U	5 U	5 U J	5 U J	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 U
Benzene	0.0%	0	60	0	6 U	6 U	11 U	5 U	5 U J	5 U J	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 U
Tetrachloroethene	33.3%	110	1400	0	110	6 U	11 U	5 U	5 U J	2 J	11 U	11 U	11 U	11 U	11 U	4 J	4 J	2 J	11 U
Toluene	26.7%	3	1500	0	6 U	6 U	11 U	5 U	3 J	1 J	11 U	11 U	11 U	11 U	11 U	3 J	3 J	11 U	11 U
Chlorobenzene	0.0%	0	1700	0	6 U	6 U	11 U	5 U	5 U J	5 U J	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 U
Xylene (total)	6.7%	11	1200	0	6 U	6 U	11 U	5 U	5 U J	5 U J	11 U	11 U	11 J	11 U	11 U	10 U	10 U	11 U	11 U
Semivolatiles (ug/kg)																			
Phenol	0.0%	0	30 or MDL	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
2-Methylphenol	0.0%	0	100 or MDL	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
4-Methylphenol	0.0%	0	900	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Benzoic acid	0.0%	0	2700	0	3500 U	3600 U	N	3400 U	3300 U	N	N	N	N	N	N	N	N	N	N
Naphthalene	18.2%	570	13,000	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	570 J	360 U	N	250 J	N	350 U	1800 U
2-Methylnaphthalene	27.3%	4700	36,400	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	4700	360 U	N	1100	N	350 U	280 J
2-Chloronaphthalene	0.0%	0	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
2-Nitroaniline	9.1%	20	430 or MDL	0	3500 U	3600 U	960 U	3400 U	3300 U	N	850 U	N	1800 U	860 U	N	850 U	N	20 J	4300 U
Acenaphthylene	0.0%	0	41,000	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
2,6-Dinitrotoluene	81.8%	760	1000	0	200 J	760	43 J	510 J	680 U	N	220 J	N	140 J	110 J	N	83 J	N	170 J	1800 U
3-Nitroaniline	0.0%	0	500 or MDL	0	3500 U	3600 U	960 U	3400 U	3300 U	N	850 U	N	1800 U	860 U	N	850 U	N	850 U	4300 U
Acenaphthene	27.3%	480	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	480 J	360 U	N	120 J	N	350 U	100 J
Dibenzofuran	9.1%	62	6200	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	62 J	N	350 U	1800 U
2,4-Dinitrotoluene	90.9%	12000	50,000*	0	3600	12000 J	520 J	2200	760	N	590	N	730 U	400	N	610	N	660	1600 J
Diethylphthalate	18.2%	18	7100	0	730 U	750 U	14 J	710 U	680 U	N	350 U	N	730 U	18 J	N	350 U	N	350 U	1800 U
Fluorene	27.3%	710	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	710 J	360 U	N	160 J	N	350 U	170 J
N-Nitrosodiphenylamine	27.3%	1500	50,000*	0	120 J	1500	400 U	71 J	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Hexachlorobenzene	0.0%	0	410	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	3500 U	3600 U	960 U	3400 U	3300 U	N	850 U	N	1800 U	860 U	N	850 U	N	850 U	4300 U
Phenanthrene	27.3%	1700	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	1700	360 U	N	260 J	N	350 U	330 J
Anthracene	18.2%	69	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	53 J	N	350 U	69 J
Carbazole	0.0%	0	50,000*	0	N	N	400 U	N	N	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Di-n-butylphthalate	90.9%	1500	8100	0	540 J	430 J	400 U	1500	110 J	N	500	N	98 J	160 J	N	140 J	N	250 J	140 J
Fluoranthene	0.0%	0	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Pyrene	18.2%	69	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	30 J	N	350 U	69 J
Butylbenzylphthalate	0.0%	0	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Benzo(a)anthracene	0.0%	0	220 or MDL	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Chrysene	0.0%	0	400	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
bis(2-Ethylhexyl)phthalate	18.2%	400	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	190 J	N	400 J	360 U	N	350 U	N	350 U	1800 U
Di-n-octylphthalate	0.0%	0	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Benzo(b)fluoranthene	0.0%	0	1100	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
benzo(k)fluoranthene	0.0%	0	1100	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Benzo(a)pyrene	0.0%	0	61 or MDL	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	730 U	750 U	400 U	710 U	680 U	N	350 U	N	730 U	360 U	N	350 U	N	350 U	1800 U

TABLE 2-8

PAD H
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS & PAD BORINGS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD H 4.0' 12/12/91 BE-H-2-91	PAD H 4.0' 12/10/91 BE-H-3-91	OB 2.0 feet 12/04/92 BE-H-5	PAD-H 0-6" 12/12/91 PBH-1-1	PAD-H 0-2' 12/12/91 PBH-1-2	PAD H 0-2' 12/12/91 PBH-1-2RE	OB 0-2' 01/14/93 PBH-2-1	OB 0-2' 01/14/93 PBH2-1RE	OB 2-4' 01/14/93 PBH-2-2	OB 0-2' 03/12/93 PBH-3-1	OB 0-2' 03/12/93 PBH3-1RE	OB 0-2' 03/12/93 PBH-4-1	OB 0-2' 03/12/93 PBH4-1RE	OB 0-2' 03/12/93 PBH-5-1	OB 0-2' 03/12/93 PBH-6-1
Pesticides/PCBs (ug/kg)																			
beta-BHC	9.1%	2.1	200	0	18 U	18 U	2 U	17 U	17 U	N	1.8 U	N	1.9 U	1.8 U	N	3.6 U	N	2.1 J	3.6 U
delta-BHC	0.0%	0	300	0	18 U	18 U	2 U	17 U	17 U	N	1.8 U	N	1.9 U	1.8 U	N	3.6 U	N	1.8 U	3.6 U
gamma-BHC (Lindane)	0.0%	0	60	0	18 U	18 U	2 U	17 U	17 U	N	1.8 U	N	1.9 U	1.8 U	N	3.6 U	N	1.8 U	3.6 U
Heptachlor	0.0%	0	100	0	18 U	18 U	2 U	17 U	17 U	N	1.8 U	N	1.9 U	1.8 U	N	3.6 U	N	1.8 U	3.6 U
Aldrin	0.0%	0	41	0	18 U	18 U	2 U	17 U	17 U	N	1.8 U	N	1.9 U	1.8 U	N	3.6 U	N	1.8 U	3.6 U
Heptachlor epoxide	0.0%	0	20	0	18 U	18 U	2 U	17 U	17 U	N	1.8 U	N	1.9 U	1.8 U	N	3.6 U	N	1.8 U	3.6 U
Endosulfan I	0.0%	0	900	0	18 U	18 U	2 U	17 U	17 U	N	1.8 U	N	1.9 U	1.8 U	N	3.6 U	N	1.8 U	3.6 U
Dieldrin	0.0%	0	44	0	35 U	36 U	3.9 U	34 U	33 U	N	3.5 U	N	3.7 U	3.5 U	N	6.9 U	N	3.5 U	7.1 U
4,4'-DDE	18.2%	4.5	2100	0	35 U	36 U	3.2 J	34 U	33 U	N	3.5 U	N	3.7 U	3.5 U	N	6.9 U	N	3.5 U	4.5 J
Endrin	0.0%	0	100	0	35 U	36 U	3.9 U	34 U	33 U	N	3.5 U	N	3.7 U	3.5 U	N	6.9 U	N	3.5 U	7.1 U
Endosulfan II	0.0%	0	900	0	35 U	36 U	3.9 U	34 U	33 U	N	3.5 U	N	3.7 U	3.5 U	N	6.9 U	N	3.5 U	7.1 U
4,4'-DDD	0.0%	0	2900	0	35 U	36 U	3.9 U	34 U	33 U	N	3.5 U	N	3.7 U	3.5 U	N	6.9 U	N	3.5 U	7.1 U
Endosulfan sulfate	0.0%	0	1000	0	35 U	36 U	3.9 U	34 U	33 U	N	3.5 U	N	3.7 U	3.5 U	N	6.9 U	N	3.5 U	7.1 U
4,4'-DDT	18.2%	3.6	2100	0	35 U	36 U	3.6 J	34 U	33 U	N	3.5 U	N	3.7 U	3.5 U	N	6.9 U	N	3.5 U	3.6 J
Endrin aldehyde	0.0%	0		NA	N	N	3.9 U	N	N	N	3.5 U	N	3.7 U	3.5 U	N	6.9 U	N	3.5 U	7.1 U
alpha-Chlordane	0.0%	0	540	0	180 U	180 U	2 U	170 U	170 U	N	1.8 U	N	1.9 U	1.8 U	N	3.6 U	N	1.8 U	3.6 U
Aroclor-1254	0.0%	0	1000	0	350 U	360 U	39 U	340 U	330 U	N	35 U	N	37 U	35 U	N	69 U	N	35 U	71 U
Aroclor-1260	0.0%	0	1000	0	350 U	360 U	39 U	340 U	330 U	N	35 U	N	37 U	35 U	N	69 U	N	35 U	71 U
Explosives (ug/kg)																			
HMX	0.0%	0		NA	1000 U	1000 U	120 U	1000 U	1000 U	N	120 U	N	120 U	120 U	N	120 U	N	120 U	120 U
RDX	18.2%	71		NA	120 U	120 U	120 U	120 U	120 U	N	120 U	N	120 U	120 U	N	120 U	N	71 J	71 J
1,3,5-Trinitrobenzene	72.7%	350		NA	330	320	80 J	200	350	N	120 U	N	120 U	120 U	N	130 J	N	79 J	200 J
1,3-Dinitrobenzene	54.5%	440		NA	120 U	120 U	120 U	440	150	N	230	N	120 U	160	N	120	N	110 J	120 U
Tetryl	27.3%	270		NA	400 U	400 U	120 U	400 U	400 U	N	120 U	N	120 U	120 U	N	180 J	N	100 J	270 J
2,4,6-Trinitrotoluene	45.5%	910		NA	110 J	210	120 U	120 U	910	N	120 U	N	120 U	120 U	N	75 J	N	120 U	210 J
4-amino-2,6-Dinitrotoluene	72.7%	810		NA	190	540	66 J	120 U	810	N	120 U	N	120 U	83 J	N	440 J	N	250	400 J
2-amino-4,6-Dinitrotoluene	63.6%	1300		NA	110 J	440	71 J	120 U	1300	N	120 U	N	120 U	120 U	N	860	N	250	640
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	120 U	120 U	120 U	N	120 U	N	120 U	120 U	N	120 U	N	120 U	120 U
2,4-Dinitrotoluene	100.0%	3900		NA	230	1500 J	240	3900	1500	N	3800	N	260	2300	N	2000	N	3400	930
Metals (mg/kg)																			
Aluminum	100.0%	19100	17503.0	2	13400	18700	19100	14000	13300	N	9080	N	13100	14400	N	14200	N	10600	6410
Antimony	9.1%	13.7	5	1	40.8 R	108 R	6.5 U R	6.1 R	5.3 R	N	5.8 UJ	N	13.7 J	4.4 UJ	N	4.6 UJ	N	4.4 UJ	3.1 UJ
Arsenic	100.0%	25.8	7.5	4	25.8	25	11.5 J	4.7 J	3.7 J	N	2.5 J	N	11.7 J	4.7	N	4.3	N	4	4.6
Barium	100.0%	4400	300	6	2580	4400	883	1810	571 J	N	144	N	708	131	N	96	N	39.6	124
Beryllium	63.6%	0.89	1	0	0.59 R	0.73 R	0.89	0.56 R	0.59 R	N	0.44 J	N	0.56	0.63 J	N	0.62 J	N	0.48 J	0.32 J
Cadmium	54.5%	6.1	1.8	4	6.1 J	5.6 J	0.95	4.5	3.6	N	0.33 U	N	0.52 J	0.33 U	N	0.33 U	N	0.32 U	0.23 U
Calcium	100.0%	34700	46825.0	0	6580	9640	15500	25200	26700	N	30200	N	13300	34700	N	26400	N	20000	16600
Chromium	81.8%	33.6	26.6	3	27.8 R	35.4 R	26.9	21.9	22.1	N	17.5	N	33.6	26.8	N	25.7	N	19.7	12
Cobalt	100.0%	14.4	30	0	8	12.7	12.7	11.2	11.2	N	8.5	N	12.7	14.3	N	14.4	N	13.9	8.6
Copper	90.9%	2900	25	10	1930	2900	427	43.5	42.6	N	27.9 R	N	742	44.2	N	44.7	N	33.2	39
Iron	100.0%	38000	32698.0	1	25900	38000	26500	25400	26900	N	19400	N	22100	32300	N	31000	N	26600	15000
Lead	100.0%	24200	30	10	6900 J	24200 J	1370	75.8	58.8	N	15.5	N	2760	75.6	N	68.7	N	30.5	51.6
Magnesium	100.0%	8450	9071.1	0	5620	8450	5660	6980	6380	N	4650	N	4890	7420	N	7220	N	5570	3480
Manganese	100.0%	732	1065.8	0	487	732	699	315	336	N	292	N	522	410	N	348	N	271	209
Mercury	72.7%	0.52	0.1	4	0.13 J	0.52 J	0.13	0.09	0.04 U	N	0.04 J	N	0.06 J	0.04 U	N	0.05 U	N	0.05 J	0.12
Nickel	100.0%	51.8	41.3	5	25.9	42.5	29.6	41.6	39.8	N	32.1	N	26.8	51.8 J	N	51.3 J	N	48.5 J	27.6 J
Potassium	100.0%	2670	1529.6	4	1120 J	1900 J	2670	1440	1430	N	961	N	1400	1580	N	1570	N	967	596
Selenium	54.5%	1.2	2	0	0.34 R	2.4 R	1.2 J	0.24 J	0.11 J	N	0.26 J	N	0.24 UJ	0.25 UJ	N	0.17 J	N	0.27 UJ	0.34 J
Silver	9.1%	0.44	0.6	0	0.98 R	1.4 R	0.38 U	0.99 U	0.87 U	N	0.34 U	N	0.44 J	0.7 U	N	0.72 U	N	0.69 U	0.49 U
Sodium	90.9%	312	76	8	110 J	312 J	82.8 R	109 J	113 J	N	70.7 J	N	112 J	139 J	N	126 J	N	82.6 J	58.8 J
Thallium	0.0%	0	0.3	0	0.34 U	0.35 U	0.42 U	0.52 U	0.33 U	N	0.34 U	N	0.56 U	0.58 U	N	0.37 U	N	0.62 U	0.52 U
Vanadium	100.0%	32.5	150	0	20.5	28.2	32.5	16.7	16.3	N	12.1	N	20.7	19.5	N	19.8	N	14.9	9
Zinc	100.0%	1590	89.1	8	1590	992	303	217	402	N	70 J	N	457	89.9 J	N	93.5 J	N	77.6 J	43.7 J
Cyanide	0.0%	0	NA	NA	0.59 U	0.6 U	0.67 U	0.63 U	0.59 U	N	0.63 U	N	0.65 U	0.64 U	N	0.63 U	N	0.64 U	0.65 U

NOTES:

a) * = As per proposed TAGM, Total VOCs <10 ppm, Total Semi-VOCs <500 ppm, Individual Semi-VOCs <50 ppm.
For certain metals, the TAGM is equal to the greater value between the proposed TAGM and site background
The number of samples above the TAGM was determined by comparison to the actual number given, not the MDL.
b) The TAGM for 1,2-Dichloroethene (trans) was used for 1,2-Dichloroethene (total) since it was the only value available.
c) NA = not applicable
d) N = Compound was not analyzed.
e) U = Compound was not detected.
f) J = The reported value is an estimated concentration.
g) R = The data was rejected in the data validation process.
h) SB = Site background
i) MDL = Method detection limit

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TABLE 2-9

PAD J
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS, PAD BORINGS,
& GEOPHYSICAL ANOMALY EXCAVATIONS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD J 3.0' 12/06/91 BE-J-4-91	PAD J 3.0' 12/06/91 BE-J-5-91	PAD J 3.0' 12/06/91 BE-J-6-91	OB 2.0 feet 12/07/92 BE-J-8	OB 2.0 feet 12/07/92 BE-J8RE	OB 2.0 feet 12/07/92 BE-J-10	OB 2.0 feet 12/07/92 BE-J-13	OB 2.0 feet 12/07/92 BE-J13RE	OB 2.0 feet 12/07/92 BE-J-14	OB 2.0 feet 12/07/92 BE-J14RE
VOCs (ug/kg)														
Methylene Chloride	8.1%	5	100	0	6 U	5 U	6 U	5 J	N	12 U	2 J	5 J	13 U	N
Acetone	0.0%	0	200	0	12 U	11 U	11 U	12 U	N	12 U	12 U	12 U	13 U	N
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U	5 U	6 U	12 U	N	12 U	12 U	12 U	13 U	N
Chloroform	10.8%	7	300	0	6 U	5 U	6 U	12 U	N	12 U	12 U	12 U	13 U	N
2-Butanone	0.0%	0	300	0	12 U	11 U	11 U	12 U	N	12 U	12 U	12 U	13 U	N
1,1,1-Trichloroethane	0.0%	0	800	0	6 U	5 U	6 U	12 U	N	12 U	12 U	12 U	13 U	N
Carbon Tetrachloride	5.4%	4	600	0	6 U	5 U	6 U	12 U	N	12 U	12 U	12 U	13 U	N
Trichloroethene	5.4%	7	700	0	6 U	5 U	6 U	12 U	N	12 U	12 U	12 U	13 U	N
Benzene	0.0%	0	60	0	6 U	5 U	6 U	12 U	N	12 U	12 U	12 U	13 U	N
Tetrachloroethene	5.4%	67	1400	0	6 U	5 U	6 U	12 U	N	12 U	25	67	13 U	N
Toluene	16.2%	3	1500	0	6 U	5 U	1 J	12 U	N	12 U	12 U	12 U	13 U	N
Chlorobenzene	0.0%	0	1700	0	6 U	5 U	6 U	12 U	N	12 U	12 U	12 U	13 U	N
Xylene (total)	2.7%	3	1200	0	6 U	5 U	6 U	12 U	N	12 U	12 U	12 U	13 U	N
Semivolatiles (ug/kg)														
Phenol	0.0%	0	30 or MDL	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
2-Methylphenol	0.0%	0	100 or MDL	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
4-Methylphenol	0.0%	0	900	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
2,4-Dimethylphenol	0.0%	0	50,000*	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Benzoic acid	5.0%	88	2700	0	88 J	3400 U	3500 U	N	N	N	N	N	N	N
Naphthalene	3.7%	26	13,000	0	750 U	700 U	720 U	400 U	N	420 U	26 J	N	400 U	N
2-Methylnaphthalene	0.0%	0	36,400	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
2-Chloronaphthalene	0.0%	0	50,000*	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
2-Nitroaniline	0.0%	0	430 or MDL	0	3600 U	3400 U	3500 U	970 U	N	1000 U	990 U	N	960 U	N
Acenaphthylene	0.0%	0	41,000	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
2,6-Dinitrotoluene	0.0%	0	1000	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
3-Nitroaniline	0.0%	0	500 or MDL	0	3600 U	3400 U	3500 U	970 U	N	1000 U	990 U	N	960 U	N
Acenaphthene	0.0%	0	50,000*	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Dibenzofuran	0.0%	0	6200	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
2,4-Dinitrotoluene	10.7%	820	50,000*	0	750 U	700 U	720 U	400 U	N	420 U	400 U	N	400 U	N
Diethylphthalate	7.1%	24	7100	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Fluorene	0.0%	0	50,000*	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
N-Nitrosodiphenylamine	3.6%	81	50,000*	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Hexachlorobenzene	0.0%	0	410	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Pentachlorophenol	0.0%	0	1000 or MDL	0	3600 U	3400 U	3500 U	970 U	N	1000 U	990 U	N	960 U	N
Phenanthrene	21.4%	270	50,000*	0	750 U	700 U	720 U	400 U	N	17 J	23 J	N	22 J	N
Anthracene	0.0%	0	50,000*	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Carbazole	0.0%	0	50,000*	0	N	N	N	400 U	N	420 U	410 U	N	400 U	N
Di-n-butylphthalate	17.9%	480	8100	0	750 U	700 U	720 U	20 J	N	21 J	23 J	N	18 J	N
Fluoranthene	25.0%	330	50,000*	0	750 U	700 U	720 U	26 J	N	19 J	20 J	N	25 J	N
Pyrene	25.0%	230	50,000*	0	750 U	700 U	720 U	24 J	N	16 J	17 J	N	20 J	N
Butylbenzylphthalate	0.0%	0	50,000*	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Benzo(a)anthracene	3.6%	86	220 or MDL	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Chrysene	17.9%	120	400	0	750 U	700 U	720 U	25 J	N	14 J	13 J	N	16 J	N
bis(2-Ethylhexyl)phthalate	46.4%	1100	50,000*	0	750 U	700 U	720 U	32 J	N	27 J	110 J	N	30 J	N
Di-n-octylphthalate	0.0%	0	50,000*	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Benzo(b)fluoranthene	10.7%	81	1100	0	750 U	700 U	720 U	23 J	N	420 U	410 U	N	15 J	N
benzo(k)fluoranthene	10.7%	[illegible]	1100	0	750 U	700 U	720 U	21 J	N	420 U	410 U	N	15 J	N
Benzo(a)pyrene	3.6%	76	61 or MDL	1	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	750 U	700 U	720 U	400 U	N	420 U	410 U	N	400 U	N

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TABLE 2-9

PAD J
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS, PAD BORINGS,
& GEOPHYSICAL ANOMALY EXCAVATIONS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD J 3.0' 12/06/91 BE-J-4-91	PAD J 3.0' 12/06/91 BE-J-5-91	PAD J 3.0' 12/06/91 BE-J-6-91	OB 2.0 feet 12/07/92 BE-J-8	OB 2.0 feet 12/07/92 BE-J8RE	OB 2.0 feet 12/07/92 BE-J-10	OB 2.0 feet 12/07/92 BE-J-13	OB 2.0 feet 12/07/92 BE-J13RE	OB 2.0 feet 12/07/92 BE-J-14	OB 2.0 feet 12/07/92 BE-J14RE
Pesticides/PCBs (ug/kg)														
beta-BHC	0.0%	0	200	0	18 U	17 U	18 U	2.1 U	2.1 U	2.2 U	2.1 U	N	2 U	2 U
delta-BHC	0.0%	0	300	0	18 U	17 U	18 U	2 1 U	2.1 U	2.2 U	2 1 U	N	2 U	2 U
gamma-BHC (Lindane)	0.0%	0	60	0	18 U	17 U	18 U	2 1 U	2.1 U	2.2 U	2.1 U	N	2 U	2 U
Heptachlor	0.0%	0	100	0	18 U	17 U	18 U	2 1 U	2.1 U	2.2 U	2.1 U	N	2 U	2 U
Aldrin	0.0%	0	41	0	18 U	17 U	18 U	2 1 U	2.1 U	2.2 U	2.1 U	N	2 U	2 U
Heptachlor epoxide	0.0%	0	20	0	18 U	17 U	18 U	2.1 U	2.1 U	2.2 U	2.1 U	N	2 U	2 U
Endosulfan I	0.0%	0	900	0	18 U	17 U	18 U	2.1 U	2.1 U	2.2 U	2.1 U	N	2 U	2 U
Dieldrin	0.0%	0	44	0	36 U	34 U	35 U	4 U	4 U	4.3 U	4.1 U	N	4 U	4 U
4,4'-DDE	46.9%	830	2100	0	36 U	34 U	35 U	4.9 J	18	6.7 J	6.5	N	4 U	3.9 J
Endrin	3.1%	41	100	0	36 U	34 U	35 U	4 U	4 U	4.3 U	4 1 U	N	4 U	4 U
Endosulfan II	0.0%	0	900	0	36 U	34 U	35 U	4 U	4 U	4.3 U	4.1 U	N	4 U	4 U
4,4'-DDD	0.0%	0	2900	0	36 U	34 U	35 U	4 U	4 U	4.3 U	4.1 U	N	4 U	4 U
Endosulfan sulfate	0.0%	0	1000	0	36 U	34 U	35 U	4 U	4 U	4.3 U	4.1 U	N	4 U	4 U
4,4'-DDT	25.0%	320	2100	0	36 U	34 U	35 U	4.6 J	17	8.3 J	9	N	4 U	5.4 J
Endrin aldehyde	0.0%	0		NA	N	N	N	4 U	4 U	4.3 U	4.1 U	N	4 U	4 U
alpha-Chlordane	0.0%	0	540	NA	180 U	170 U	180 U	'2.1 U	2.1 U	2.2 U	2.1 U	N	2 U	2 U
Aroclor-1254	0.0%	0	1000	NA	360 U	340 U	350 U	40 U	40 U	43 U	41 U	N	40 U	40 U
Aroclor-1260	0.0%	0	1000	NA	360 U	340 U	350 U	40 U	40 U	43 U	41 U	N	40 U	40 U
Explosives (ug/kg)														
HMX	0.0%	0		NA	990 U	1000 U	990 U	120 U	N	120 U	120 U	N	120 U	N
RDX	3.6%	270		NA	120 U	120 U	120 U	120 U	N	120 U	120 U	N	120 U	N
1,3,5-Trinitrobenzene	3.6%	120		NA	120 U	120 U	120 U	120 U	N	120 U	120 U	N	120 U	N
1,3-Dinitrobenzene	0.0%	0		NA	120 U	120 U	120 U	120 U	N	120 U	120 U	N	120 U	N
Tetryl	0.0%	0		NA	390 U	400 U	390 U	120 U	N	120 U	120 U	N	120 U	N
2,4,6-Trinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	N	120 U	120 U	N	120 U	N
4-amino-2,6-Dinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	N	120 U	120 U	N	120 U	N
2-amino-4,6-Dinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	N	120 U	120 U	N	120 U	N
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	120 U	120 U	N	120 U	120 U	N	120 U	N
2,4-Dinitrotoluene	42.9%	420		NA	120 U	170	92 J	120 U	N	120 U	120 U	N	120 U	N
Metals (mg/kg)														
Aluminum	100.0%	30200	17503.0	13	16700	13800	16000	15700	N	22400	24500	N	26300	N
Antimony	25.0%	15.3	5	7	5.4 R	5.1 R	5.5 R	7.7 R	N	16 R	18.2 R	N	5.9 U R	N
Arsenic	89.3%	8.1	7.5	2	4.1 R	3.4 R	4.6 R	5.9 J	N	4.9 J	5.3 J	N	5 J	N
Barium	75.0%	34400	300	18	213 R	136 R	470 R	2200	N	28300	22000	N	34400	N
Beryllium	42.9%	0.78	1	0	0.9 R	0.74 R	0.95 R	0.77	N	0.52 J	0.65	N	0.54 J	N
Cadmium	89.3%	10	1.8	23	3.4 J	4.5 J	3.4 J	0.73	N	5.1	3.8	N	5.8	N
Calcium	100.0%	71300	46825.0	2	3310	8200	7930	7430	N	12600	20300	N	7870	N
Chromium	92.9%	52.7	26.6	18	19 R	21.8 R	19 9 J	22.7	N	52.7	34.9	N	22.1	N
Cobalt	100.0%	33.4	30	2	9.7	7.4	7.9	10.4	N	30.7	26.4	N	33.4	N
Copper	85.7%	6560	25	24	29.8	137	59.9	54.1	N	231	348	N	340	N
Iron	100.0%	95800	32698.0	12	24100	18500	20800	23400	N	95800 J	24500	N	17400 J	N
Lead	89.3%	2040	30	21	32.4 J	644 J	48 J	363	N	347	204	N	2040 J	N
Magnesium	100.0%	24100	9071.1	15	3320	3650	4270	5390	N	24100 J	22300	N	23100	N
Manganese	100.0%	1320	1065.8	1	978	451	802	599	N	897	528	N	1320	N
Mercury	57.1%	1.1	0.1	13	0.37 J	0.27 J	0.39 J	0.18	N	0.23	0.36	N	0.15	N
Nickel	100 0%	57.3	41.3	13	15.7	21.9	20	24.5	N	38.2	33.8	N	17.7	N
Potassium	100.0%	3500	1529.6	14	1550 J	1150 J	1380 J	1410	N	1380	1800	N	1070	N
Selenium	60.7%	1.1	2	0	0.1 R	0.1 R	0.1 R	0.53 J	N	1 J	1.1 J	N	0.77 J	N
Silver	32.1%	1.2	0.6	6	0.34 U	0.45 R	0.55 R	0.38 U	N	0.41 U	0.53 J	N	0.35 U	N
Sodium	78.6%	376	76	18	54.7 J	54.5 J	56 J	113 R	N	709 R	519 R	N	319 R	N
Thallium	39.3%	38	0.3	11	0.33 U	0.32 U	0.33 U	0.47 U	N	0.45 U	0.4 U	N	0.52 U	N
Vanadium	100.0%	41.6	150	0	30.1	24	26.5	26.1	N	23.9	25.3	N	20.9	N
Zinc	100.0%	5790	89.1	28	138	903	156	446	N	3190	2390	N	3240	N
Cyanide	0.0%	0	NA	NA	0.66 U	0.62 U	0.44 U	0.71 U	N	0.78 U	0.75 U	N	0.54 U	N

TABLE 2-9

PAD J
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS, PAD BORINGS,
& GEOPHYSICAL ANOMALY EXCAVATIONS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD J 0-6" 01/13/92 PBJ-1-1DL	PAD I 0-6" 01/13/92 PBJ-1-1DL1	PAD J 0-6" 01/13/92 PBJ-1-1	PAD J 0-6" 01/13/92 PBJ-1-1RE	PAD J 0-2' 01/13/92 PBJ-1-2	PAD J 0-6" 01/13/92 PBJ-2-1	PAD J 0-2' 01/14/92 PBJ-2-2	PAD J 0-6" 01/14/92 PBJ-3-1	PAD-J 0-6" 01/14/92 PBJ-3-1RE	PAD-J 0-2' 01/15/92 PBJ-3-2	PAD-J 0-6" 01/15/92 PBJ-4-1
VOCs (ug/kg)															
Methylene Chloride	8.1%	5	100	0	N	N	6 U J	6 U J	6 U	7 U	6 U	7 U J	8 U J	6 U	12 U
Acetone	0.0%	0	200	0	N	N	11 U J	11 U J	12 U	12 U	12 U	14 U J	15 U J	12 U	12 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	N	N	6 U J	6 U J	6 U	6 U	6 U	7 U J	8 U J	6 U	6 U
Chloroform	10.8%	7	300	0	N	N	6 U J	6 U J	6 U	6 U	2 J	6 J	8 U J	6 U	6 U
2-Butanone	0.0%	0	300	0	N	N	11 U J	11 U J	12 U	12 U	12 U	14 U J	15 U J	12 U	12 U
1,1,1-Trichloroethane	0.0%	0	800	0	N	N	6 U J	6 U J	6 U	6 U	6 U	7 U J	8 U J	6 U	6 U
Carbon Tetrachloride	5.4%	4	600	0	N	N	6 U J	6 U J	6 U	6 U	6 U	7 U J	8 U J	6 U	6 U
Trichloroethene	5.4%	7	700	0	N	N	6 U J	6 U J	6 U	6 U	6 U	7 U J	8 U J	6 U	6 U
Benzene	0.0%	0	60	0	N	N	6 U J	6 U J	6 U	6 U	6 U	7 U J	8 U J	6 U	6 U
Tetrachloroethene	5.4%	67	1400	0	N	N	6 U J	6 U J	6 U	6 U	6 U	7 U J	8 U J	6 U	6 U
Toluene	16.2%	3	1500	0	N	N	6 U J	6 U J	6 U	1 J	6 U	7 U J	8 U J	6 U	6 U
Chlorobenzene	0.0%	0	1700	0	N	N	6 U J	6 U J	6 U	6 U	6 U	7 U J	8 U J	6 U	6 U
Xylene (total)	2.7%	3	1200	0	N	N	6 U J	6 U J	6 U	6 U	6 U	7 U J	8 U J	6 U	6 U
Semivolatiles (ug/kg)															
Phenol	0.0%	0	30 or MDL	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
2-Methylphenol	0.0%	0	100 or MDL	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
4-Methylphenol	0.0%	0	900	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Benzoic acid	5.0%	88	2700	0	N	N	3900 U	N	3800 U	4000 U	3800 U	3900 U	N	3600 U	3600 U
Naphthalene	3.7%	26	13,000	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
2-Methylnaphthalene	0.0%	0	36,400	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
2-Chloronaphthalene	0.0%	0	50,000*	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
2-Nitroaniline	0.0%	0	430 or MDL	0	N	N	3900 U	N	3800 U	4000 U	3800 U	3900 U	N	3600 U	3600 U
Acenaphthylene	0.0%	0	41,000	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
2,6-Dinitrotoluene	0.0%	0	1000	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
3-Nitroaniline	0.0%	0	500 or MDL	0	N	N	3900 U	N	3800 U	4000 U	3800 U	3900 U	N	3600 U	3600 U
Acenaphthene	0.0%	0	50,000*	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Dibenzofuran	0.0%	0	6200	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
2,4-Dinitrotoluene	10.7%	820	50,000*	0	N	N	130 J	N	770 U	820 J	770 U	800 U	N	750 U	740 U
Diethylphthalate	7.1%	24	7100	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Fluorene	0.0%	0	50,000*	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
N-Nitrosodiphenylamine	3.6%	81	50,000*	0	N	N	800 U	N	770 U	81 J	770 U	800 U	N	750 U	740 U
Hexachlorobenzene	0.0%	0	410	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	N	N	3900 U	N	3800 U	4000 U	3800 U	3900 U	N	3600 U	3600 U
Phenanthrene	21.4%	270	50,000*	0	N	N	93 J	N	770 U	840 U	770 U	800 U	N	750 U	69 J
Anthracene	0.0%	0	50,000*	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Carbazole	0.0%	0	50,000*	0	N	N	N	N	N	N	N	N	N	N	N
Di-n-butylphthalate	17.9%	480	8100	0	N	N	480 J	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Fluoranthene	25.0%	330	50,000*	0	N	N	96 J	N	770 U	840 U	770 U	800 U	N	750 U	90 J
Pyrene	25.0%	230	50,000*	0	N	N	100 J	N	770 U	840 U	770 U	800 U	N	750 U	78 J
Butylbenzylphthalate	0.0%	0	50,000*	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Benzo(a)anthracene	3.6%	86	220 or MDL	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Chrysene	17.9%	120	400	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
bis(2-Ethylhexyl)phthalate	46.4%	1100	50,000*	0	N	N	800 U	N	770 U	190 J	110 J	800 U	N	750 U	140 J
Di-n-octylphthalate	0.0%	0	50,000*	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Benzo(b)fluoranthene	10.7%	81	1100	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
benzo(k)fluoranthene	10.7%	96	1100	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Benzo(a)pyrene	3.6%	76	61 or MDL	1	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	N	N	800 U	N	770 U	840 U	770 U	800 U	N	750 U	740 U

TABLE 2-9

PAD J
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS, PAD BORINGS,
& GEOPHYSICAL ANOMALY EXCAVATIONS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD J 0-6" 01/13/92 PBJ-1-1DL	PAD J 0-6" 01/13/92 PBJ-1-1DL1	PAD J 0-6" 01/13/92 PBJ-1-1	PAD J 0-6" 01/13/92 PBJ-1-1RE	PAD J 0-2' 01/13/92 PBJ-1-2	PAD J 0-6" 01/13/92 PBJ-2-1	PAD J 0-2' 01/14/92 PBJ-2-2	PAD J 0-6" 01/14/92 PBJ-3-1	PAD-J 0-6" 01/14/92 PBJ-3-1RE	PAD-J 0-2' 01/15/92 PBJ-3-2	PAD-J 0-6" 01/15/92 PBJ-4-1
Pesticides/PCBs (ug/kg)															
beta-BHC	0.0%	0	200	0	58 U	580 U R	N	N	19 U	20 U	19 U	19 U	N	18 U	18 U
delta-BHC	0.0%	0	300	0	58 U	580 U R	N	N	19 U	20 U	19 U	19 U	N	18 U	18 U
gamma-BHC (Lindane)	0.0%	0	60	0	58 U	580 U R	N	N	19 U	20 U	19 U	19 U	N	18 U	18 U
Heptachlor	0.0%	0	100	0	58 U	580 U R	N	N	19 U	20 U	19 U	19 U	N	18 U	18 U
Aldrin	0.0%	0	41	0	58 U	580 U R	N	N	19 U	20 U	19 U	19 U	N	18 U	18 U
Heptachlor epoxide	0.0%	0	20	0	58 U	580 U R	N	N	19 U	20 U	19 U	19 U	N	18 U	18 U
Endosulfan I	0.0%	0	900	0	58 U	580 U R	N	N	19 U	20 U	19 U	19 U	N	18 U	18 U
Dieldrin	0.0%	0	44	0	120 U	1200 U R	N	N	38 U	40 U	38 U	39 U	N	36 U	36 U
4,4'-DDE	46.9%	830	2100	0	980 R	830 J	N	N	32 J	38 J	38 U	21 J	N	36 U	25 J
Endrin	3.1%	41	100	0	120 U	1200 U R	N	N	38 U	40 U	38 U	39 U	N	36 U	36 U
Endosulfan II	0.0%	0	900	0	120 U	1200 U R	N	N	38 U	40 U	38 U	39 U	N	36 U	36 U
4,4'-DDD	0.0%	0	2900	0	120 U	1200 U R	N	N	38 U	40 U	38 U	39 U	N	36 U	36 U
Endosulfan sulfate	0.0%	0	1000	0	120 U	1200 U R	N	N	38 U	40 U	38 U	39 U	N	36 U	36 U
4,4'-DDT	25.0%	320	2100	0	320	1200 U R	N	N	38 U	40 U	38 U	39 U	N	36 U	36 U
Endrin aldehyde	0.0%	0		NA	N	N	N	N	N	N	N	N	N	N	N
alpha-Chlordane	0.0%	0	540	NA	580 U	5800 U R	N	N	190 U	200 U	190 U	190 U	N	180 U	180 U
Aroclor-1254	0.0%	0	1000	NA	1200 U	12000 U R	N	N	380 U	400 U	380 U	390 U	N	360 U	360 U
Aroclor-1260	0.0%	0	1000	NA	1200 U	12000 U R	N	N	380 U	400 U	380 U	390 U	N	360 U	360 U
Explosives (ug/kg)															
HMX	0.0%	0		NA	N	N	1000 U	N	1000 U	1000 U	1000 U	1000 U	N	1000 U	1000 U
RDX	3.6%	270		NA	N	N	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U
1,3,5-Trinitrobenzene	3.6%	120		NA	N	N	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U
1,3-Dinitrobenzene	0.0%	0		NA	N	N	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U
Tetryl	0.0%	0		NA	N	N	400 U	N	400 U	400 U	400 U	400 U	N	400 U	400 U
2,4,6-Trinitrotoluene	0.0%	0		NA	N	N	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U
4-amino-2,6-Dinitrotoluene	0.0%	0		NA	N	N	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U
2-amino-4,6-Dinitrotoluene	0.0%	0		NA	N	N	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U
2,6-Dinitrotoluene	0.0%	0	1000	0	N	N	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U
2,4-Dinitrotoluene	42.9%	420		NA	N	N	420	N	120 U	370	120 U	300	N	120 U	86 J
Metals (mg/kg)															
Aluminum	100.0%	30200	17503.0	13	N	N	18800	N	26900	21800	21400	16800	N	17000	19900
Antimony	25.0%	15.3	5	7	N	N	6.1 UJ	N	5.8 UJ	5.7 UJ	5.8 UJ	6.1 UJ	N	8.6 J	10.3 J
Arsenic	89.3%	8.1	7.5	2	N	N	3.7	N	4.9	4.1	4.3	4.8	N	7.1	8.1
Barium	75.0%	34400	300	18	N	N	8130	N	1660	2520	351 R	3470	N	2830	5610
Beryllium	42.9%	0.78	1	0	N	N	0.7 R	N	1.3 R	1 R	1 R	0.91 R	N	0.83 R	0.82 R
Cadmium	89.3%	10	1.8	23	N	N	4.8 J	N	4.3 J	5.4 J	4.1 J	4.8 J	N	3.8 J	6.9 J
Calcium	100.0%	71300	46825.0	2	N	N	22800	N	11700	34400	19100	27200	N	22700 J	32300
Chromium	92.9%	52.7	26.6	18	N	N	30.1 J	N	35.4 J	38.5 J	30.4 J	34.4 J	N	31.9 J	50.8 J
Cobalt	100.0%	33.4	30	2	N	N	9.1	N	15.5	15.5	15.2	11.9	N	11.8	16.5
Copper	85.7%	6560	25	24	N	N	143	N	58.4	137	69.3	435	N	158	262
Iron	100.0%	95800	32698.0	12	N	N	20700	N	37700	42500	33300	31600	N	31000	39200
Lead	89.3%	2040	30	21	N	N	356	N	80.9	266	115	448	N	29.2 R	1340
Magnesium	100.0%	24100	9071.1	15	N	N	16700	N	8650	10600	7510	10200	N	7730	11400
Manganese	100.0%	1320	1065.8	1	N	N	334	N	774	619	437	393	N	490	475
Mercury	57.1%	1.1	0.1	13	N	N	0.11 R	N	0.12 R	0.17 R	0.1 R	0.19 R	N	0.11 R	0.11 R
Nickel	100.0%	57.3	41.3	13	N	N	38.4	N	42.5	57.3	44.8	46.7	N	36.5	48
Potassium	100.0%	3500	1529.6	14	N	N	1520 J	N	2930 J	2310 J	1980 J	1740 J	N	1730 J	2780 J
Selenium	60.7%	1.1	2	0	N	N	0.33 J	N	0.2 UJ	0.24 J	0.21 J	0.31 J	N	0.12 UJ	0.22 J
Silver	32.1%	1.2	0.6	6	N	N	0.39 U	N	0.37 U	0.37 U	0.4 J	0.65 J	N	0.74 J	0.61 J
Sodium	78.6%	376	76	18	N	N	244 J	N	164 J	165 J	145 J	341 J	N	224 J	258 J
Thallium	39.3%	38	0.3	11	N	N	0.43 J	N	0.48 U	0.56 J	0.63 J	0.35 J	N	0.59 J	0.35 J
Vanadium	100.0%	41.6	150	0	N	N	17.8 J	N	39 J	27.1 J	26.8 J	20.5 J	N	26 J	27.2 J
Zinc	100.0%	5790	89.1	28	N	N	1380	N	246	512	344	5790	N	700	1510
Cyanide	0.0%	0	NA	NA	N	N	0.7 U	N	0.72 U	0.69 U	0.7 U	0.64 U	N	0.52 U	0.58 U

TABLE 2-9

PAD J
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS, PAD BORINGS,
& GEOPHYSICAL ANOMALY EXCAVATIONS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD J 0-2' 01/15/92 PBJ-4-2	PAD-J 4'+ 01/15/92 PBJ-4-4	PAD-J 0-6" 01/15/92 PBJ-5-1	PAD-J 0-6" 01/15/92 PBJ-5-1RE	PAD-J 0-2' 01/15/92 PBJ-5-2	PAD-J 0-2' 01/15/92 PBJ-5-2RE	PAD-J 0-6" 01/15/92 PBJ-6-1	PAD-J 0-6" 01/15/92 PBJ-6-1DL	PAD-J 0-6" 01/15/92 PBJ-6-1RE	PAD-J 0-2' 01/15/92 PBJ-6-2	PAD-J 0-2' 01/15/92 PBJ-6-2RE
VOCs (ug/kg)															
Methylene Chloride	8.1%	5	100	0	N	6 U	10 U J	6 U J	6 U J	9 U J	8 U	N	7 U J	9 U J	9 U J
Acetone	0.0%	0	200	0	N	11 U	12 U J	11 U J	11 U J	11 U J	12 U	N	12 U J	11 U J	11 U J
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	N	6 U	6 U J	6 U J	6 U J	6 U J	6 U	N	6 U J	5 U J	5 U J
Chloroform	10.8%	7	300	0	N	6 U	6 U J	6 U J	6 U J	6 U J	6 U	N	6 U J	3 J	5 U J
2-Butanone	0.0%	0	300	0	N	11 U	12 U J	11 U J	11 U J	11 U J	12 U	N	12 U J	11 U J	11 U J
1,1,1-Trichloroethane	0.0%	0	800	0	N	6 U	6 U J	6 U J	6 U J	6 U J	6 U	N	6 U J	5 U J	5 U J
Carbon Tetrachloride	5.4%	4	600	0	N	6 U	6 U J	6 U J	6 U J	6 U J	6 U	N	6 U J	4 J	2 J
Trichloroethene	5.4%	7	700	0	N	6 U	6 U J	6 U J	6 U J	6 U J	6 U	N	6 U J	7	4 J
Benzene	0.0%	0	60	0	N	6 U	6 U J	6 U J	6 U J	6 U J	6 U	N	6 U J	5 U J	5 U J
Tetrachloroethene	5.4%	67	1400	0	N	6 U	6 U J	6 U J	6 U J	6 U J	6 U	N	6 U J	5 U J	5 U J
Toluene	16.2%	3	1500	0	N	6 U	6 U J	6 U J	6 U J	1 J	6 U	N	6 U J	5 U J	5 U J
Chlorobenzene	0.0%	0	1700	0	N	6 U	6 U J	6 U J	6 U J	6 U J	6 U	N	6 U J	5 U J	5 U J
Xylene (total)	2.7%	3	1200	0	N	6 U	6 U J	6 U J	6 U J	6 U J	6 U	N	6 U J	5 U J	5 U J
Semivolatiles (ug/kg)															
Phenol	0.0%	0	30 or MDL	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
2-Methylphenol	0.0%	0	100 or MDL	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
4-Methylphenol	0.0%	0	900	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
2,4-Dimethylphenol	0.0%	0	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Benzoic acid	5.0%	88	2700	0	3400 U	N	3700 U	N	3600 U	N	3800 U	N	N	3500 U	N
Naphthalene	3.7%	26	13,000	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
2-Methylnaphthalene	0.0%	0	36,400	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
2-Chloronaphthalene	0.0%	0	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
2-Nitroaniline	0.0%	0	430 or MDL	0	3400 U	N	3700 U	N	3600 U	N	3800 U	N	N	3500 U	N
Acenaphthylene	0.0%	0	41,000	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
2,6-Dinitrotoluene	0.0%	0	1000	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
3-Nitroaniline	0.0%	0	500 or MDL	0	3400 U	N	3700 U	N	3600 U	N	3800 U	N	N	3500 U	N
Acenaphthene	0.0%	0	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Dibenzofuran	0.0%	0	6200	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
2,4-Dinitrotoluene	10.7%	820	50,000*	0	380 J	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Diethylphthalate	7.1%	24	7100	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Fluorene	0.0%	0	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
N-Nitrosodiphenylamine	3.6%	81	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Hexachlorobenzene	0.0%	0	410	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Pentachlorophenol	0.0%	0	1000 or MDL	0	3400 U	N	3700 U	N	3600 U	N	3800 U	N	N	3500 U	N
Phenanthrene	21.4%	270	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	270 J	N
Anthracene	0.0%	0	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Carbazole	0.0%	0	50,000*	0	N	N	N	N	N	N	N	N	N	N	N
Di-n-butylphthalate	17.9%	480	8100	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Fluoranthene	25.0%	330	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	330 J	N
Pyrene	25.0%	230	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	230 J	N
Butylbenzylphthalate	0.0%	0	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Benzo(a)anthracene	3.6%	86	220 or MDL	0	710 U	N	760 U	N	740 U	N	780 U	N	N	86 J	N
Chrysene	17.9%	120	400	0	710 U	N	760 U	N	740 U	N	780 U	N	N	120 J	N
bis(2-Ethylhexyl)phthalate	46.4%	1100	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	130 J	N
Di-n-octylphthalate	0.0%	0	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Benzo(b)fluoranthene	10.7%	81	1100	0	710 U	N	760 U	N	740 U	N	780 U	N	N	81 J	N
benzo(k)fluoranthene	10.7%	96	1100	0	710 U	N	760 U	N	740 U	N	780 U	N	N	96 J	N
Benzo(a)pyrene	3.6%	76	61 or MDL	1	710 U	N	760 U	N	740 U	N	780 U	N	N	76 J	N
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	710 U	N	760 U	N	740 U	N	780 U	N	N	720 U	N

PAD J
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS, PAD BORINGS,
& GEOPHYSICAL ANOMALY EXCAVATIONS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD J 0-2' 01/15/92 PBJ-4-2	PAD-J 4'+ 01/15/92 PBJ-4-4	PAD-J 0-6" 01/15/92 PBJ-5-1	PAD-J 0-6" 01/15/92 PBJ-5-1RE	PAD-J 0-2' 01/15/92 PBJ-5-2	PAD-J 0-2' 01/15/92 PBJ-5-2RE	PAD-J 0-6" 01/15/92 PBJ-6-1	PAD-J 0-6" 01/15/92 PBJ-6-1DL	PAD-J 0-6" 01/15/92 PBJ-6-1RE	PAD-J 0-2' 01/15/92 PBJ-6-2	PAD-J 0-2' 01/15/92 PBJ-6-2RE
Pesticides/PCBs (ug/kg)															
beta-BHC	0.0%	0	200	0	17 U	N	18 U	N	18 U	N	19 U	57 U R	N	17 U	N
delta-BHC	0.0%	0	300	0	17 U	N	18 U	N	18 U	N	19 U	57 U R	N	17 U	N
gamma-BHC (Lindane)	0.0%	0	60	0	17 U	N	18 U	N	18 U	N	19 U	57 U R	N	17 U	N
Heptachlor	0.0%	0	100	0	17 U	N	18 U	N	18 U	N	19 U	57 U R	N	17 U	N
Aldrin	0.0%	0	41	0	17 U	N	18 U	N	18 U	N	19 U	57 U R	N	17 U	N
Heptachlor epoxide	0.0%	0	20	0	17 U	N	18 U	N	18 U	N	19 U	57 U R	N	17 U	N
Endosulfan I	0.0%	0	900	0	17 U	N	18 U	N	18 U	N	19 U	57 U R	N	17 U	N
Dieldrin	0.0%	0	44	0	34 U	N	37 U	N	36 U	N	38 U	110 U R	N	35 U	N
4,4'-DDE	46.9%	830	2100	0	34 U	N	18 J	N	36 U	N	97 R	79 J	N	19 J	N
Endrin	3.1%	41	100	0	34 U	N	37 U	N	36 U	N	38 U	110 U R	N	35 U	N
Endosulfan II	0.0%	0	900	0	34 U	N	37 U	N	36 U	N	38 U	110 U R	N	35 U	N
4,4'-DDD	0.0%	0	2900	0	34 U	N	37 U	N	36 U	N	38 U	110 U R	N	35 U	N
Endosulfan sulfate	0.0%	0	1000	0	34 U	N	37 U	N	36 U	N	38 U	110 U R	N	35 U	N
4,4'-DDT	25.0%	320	2100	0	34 U	N	37 U	N	36 U	N	23 J	110 U R	N	35 U	N
Endrin aldehyde	0.0%	0		NA	N	N	N	N	N	N	N	N	N	N	N
alpha-Chlordane	0.0%	0	540	NA	170 U	N	180 U	N	180 U	N	190 U	570 U R	N	170 U	N
Aroclor-1254	0.0%	0	1000	NA	340 U	N	370 U	N	360 U	N	380 U	1100 U R	N	350 U	N
Aroclor-1260	0.0%	0	1000	NA	340 U	N	370 U	N	360 U	N	380 U	1100 U R	N	350 U	N
Explosives (ug/kg)															
HMX	0.0%	0		NA	1000 U	N	1080 U	N	1000 U	N	1000 U	N	N	1000 U	N
RDX	3.6%	270		NA	120 U	N	120 U	N	120 U	N	270 J	N	N	120 U	N
1,3,5-Trinitrobenzene	3.6%	120		NA	120 U	N	120 U	N	120 U	N	120	N	N	120 U	N
1,3-Dinitrobenzene	0.0%	0		NA	120 U	N	120 U	N	120 U	N	120 U	N	N	120 U	N
Tetryl	0.0%	0		NA	400 U	N	400 U	N	400 U	N	400 U	N	N	400 U	N
2,4,6-Trinitrotoluene	0.0%	0		NA	120 U	N	120 U	N	120 U	N	120 U	N	N	120 U	N
4-amino-2,6-Dinitrotoluene	0.0%	0		NA	120 U	N	120 U	N	120 U	N	120 U	N	N	120 U	N
2-amino-4,6-Dinitrotoluene	0.0%	0		NA	120 U	N	120 U	N	120 U	N	120 U	N	N	120 U	N
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	N	120 U	N	120 U	N	120 U	N	N	120 U	N
2,4-Dinitrotoluene	42.9%	420		NA	130	N	210	N	330	N	77 J	N	N	140	N
Metals (mg/kg)															
Aluminum	100.0%	30200	17503.0	13	20100	N	18800	N	16500	N	20700	N	N	14200	N
Antimony	25.0%	15.3	5	7	6.6 J	N	15.3 J	N	6.4 J	N	5.7 UJ	N	N	5.6 UJ	N
Arsenic	89.3%	8.1	7.5	2	5.2	N	7.7	N	6.7	N	4.5	N	N	3.8	N
Barium	75.0%	34400	300	18	707 R	N	5650	N	2270	N	5180	N	N	785 R	N
Beryllium	42.9%	0.78	1	0	0.81 R	N	0.74 R	N	0.8 R	N	0.85 R	N	N	0.73 R	N
Cadmium	89.3%	10	1.8	23	4.5 J	N	10 J	N	4.9 J	N	6.9 J	N	N	3.8 J	N
Calcium	100.0%	71300	46825.0	2	37300	N	32800	N	34900	N	37800	N	N	32200	N
Chromium	92.9%	52.7	26.6	18	36.9 J	N	39.8 J	N	35.6 J	N	38.2 J	N	N	27.1 J	N
Cobalt	100.0%	33.4	30	2	17.2	N	13.7	N	13.9	N	13.8	N	N	12.5	N
Copper	85.7%	6560	25	24	104	N	520	N	235	N	6560	N	N	64.9	N
Iron	100.0%	95800	32698.0	12	39800	N	33800	N	33900	N	37400	N	N	33400	N
Lead	89.3%	2040	30	21	105	N	1840	N	530	N	117	N	N	74.3 R	N
Magnesium	100.0%	24100	9071.1	15	9150	N	12800	N	9580	N	12700	N	N	7730	N
Manganese	100.0%	1320	1065.8	1	432	N	464	N	419	N	445	N	N	376	N
Mercury	57.1%	1.1	0.1	13	0.13 R	N	0.07 R	N	0.11 R	N	0.19 R	N	N	0.15 R	N
Nickel	100.0%	57.3	41.3	13	55.2	N	46	N	50.1	N	55.5	N	N	45.4	N
Potassium	100.0%	3500	1529.6	14	1760 J	N	2160 J	N	2070 J	N	2190 J	N	N	1490 J	N
Selenium	60.7%	1.1	2	0	0.29 J	N	0.25 J	N	0.39 J	N	0.42 J	N	N	0.29 J	N
Silver	32.1%	1.2	0.6	6	0.45 J	N	0.89 J	N	0.62 J	N	1.2	N	N	0.36 U	N
Sodium	78.6%	376	76	18	202 J	N	376 J	N	296 J	N	189 J	N	N	106 J	N
Thallium	39.3%	38	0.3	11	0.48 J	N	0.54 J	N	38 J	N	0.39 U	N	N	0.61 J	N
Vanadium	100.0%	41.6	150	0	23.6 J	N	24.6 J	N	23.9 J	N	27.1 J	N	N	19.1 J	N
Zinc	100.0%	5790	89.1	28	245	N	2160	N	985	N	2100	N	N	262	N
Cyanide	0.0%	0	NA	NA	0.62 U	N	0.65 U	N	0.6 U	N	0.64 U	N	N	0.63 U	N

TABLE 2-9

PAD J
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS, PAD BORINGS,
& GEOPHYSICAL ANOMALY EXCAVATIONS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD-J 0-6" 01/17/92 PBJ-7-1	PAD-J 0-6" 01/17/92 PBJ-7-1RE	PAD-J 0-2' 01/17/92 PBJ-7-2	PAD-J 0-2' 01/17/92 PBJ-7-2RE	PAD-J 0-6" 01/17/92 PBJ-8-1	PAD-J 0-2' 01/17/92 PBJ-8-2	OB 0-2 01/13/93 PBJ-9-1	OB 2-4 01/13/93 PBJ-9-2	OB 0-2 01/12/93 PBJ-10-1	OB 4-5 01/12/93 PBJ-10-3	GAE-J 1.0' 12/11/91 GAE-J-1
VOCs (ug/kg)															
Methylene Chloride	8.1%	5	100	0	5 U J	7 U J	10 U J	10 U J	7 U	10 U	12 U	12 U	12 U	11 U	6 U
Acetone	0.0%	0	200	0	11 U J	11 U J	20 U J	16 U J	13 U	12 U	12 U	12 U	12 U	11 U	12 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	5 U J	6 U J	5 U J	5 U J	7 U	6 U	12 U	12 U	12 U	11 U	6 U
Chloroform	10.8%	7	300	0	5 U J	6 U J	5 U J	7	7 U	6 U	12 U	12 U	12 U	11 U	6 U
2-Butanone	0.0%	0	300	0	11 U J	11 U J	11 U J	11 U J	13 U	12 U	12 U	12 U	12 U	11 U	12 U
1,1,1-Trichloroethane	0.0%	0	800	0	5 U J	6 U J	5 U J	5 U J	7 U	6 U	12 U	12 U	12 U	11 U	6 U
Carbon Tetrachloride	5.4%	4	600	0	5 U J	6 U J	5 U J	5 U J	7 U	6 U	12 U	12 U	12 U	11 U	6 U
Trichloroethene	5.4%	7	700	0	5 U J	6 U J	5 U J	5 U J	7 U	6 U	12 U	12 U	12 U	11 U	6 U
Benzene	0.0%	0	60	0	5 U J	6 U J	5 U J	5 U J	7 U	6 U	12 U	12 U	12 U	11 U	6 U
Tetrachloroethene	5.4%	67	1400	0	5 U J	6 U J	5 U J	5 U J	7 U	6 U	12 U	12 U	12 U	11 U	6 U
Toluene	16.2%	3	1500	0	5 U J	6 U J	3 J	2 J	7 U	6 U	12 U	3 J	12 U	11 U	6 U
Chlorobenzene	0.0%	0	1700	0	5 U J	6 U J	5 U J	5 U J	7 U	6 U	12 U	12 U	12 U	11 U	6 U
Xylene (total)	2.7%	3	1200	0	5 U J	6 U J	3 J	5 U J	7 U	6 U	12 U	12 U	12 U	11 U	6 U
Semivolatiles (ug/kg)															
Phenol	0.0%	0	30 or MDL	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	N	380 U	790 U
2-Methylphenol	0.0%	0	100 or MDL	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	N	380 U	790 U
4-Methylphenol	0.0%	0	900	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	N	380 U	790 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	N	380 U	790 U
Benzoic acid	5.0%	88	2700	0	3600 U	N	3400 U	N	4200 U	3900 U	N	N	N	N	3800 U
Naphthalene	3.7%	26	13,000	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	N	380 U	790 U
2-Methylnaphthalene	0.0%	0	36,400	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	N	380 U	790 U
2-Chloronaphthalene	0.0%	0	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	N	380 U	790 U
2-Nitroaniline	0.0%	0	430 or MDL	0	3600 U	N	3400 U	N	4200 U	3900 U	950 U	870 U	N	930 U	3800 U
Acenaphthylene	0.0%	0	41,000	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	N	380 U	790 U
2,6-Dinitrotoluene	0.0%	0	1000	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	N	380 U	790 U
3-Nitroaniline	0.0%	0	500 or MDL	0	3600 U	N	3400 U	N	4200 U	3900 U	950 U	870 U	N	930 U	3800 U
Acenaphthene	0.0%	0	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	N	380 U	790 U
Dibenzofuran	0.0%	0	6200	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
2,4-Dinitrotoluene	10.7%	820	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Diethylphthalate	7.1%	24	7100	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	24 J	18 J	790 U
Fluorene	0.0%	0	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
N-Nitrosodiphenylamine	3.6%	81	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Hexachlorobenzene	0.0%	0	410	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	3600 U	N	3400 U	N	4200 U	3900 U	950 U	870 U	1000 U	930 U	3800 U
Phenanthrene	21.4%	270	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Anthracene	0.0%	0	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Carbazole	0.0%	0	50,000*	0	N	N	N	N	N	N	390 U	360 U	420 U	380 U	N
Di-n-butylphthalate	17.9%	480	8100	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Fluoranthene	25.0%	330	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Pyrene	25.0%	230	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Butylbenzylphthalate	0.0%	0	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Benzo(a)anthracene	3.6%	86	220 or MDL	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Chrysene	17.9%	120	400	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
bis(2-Ethylhexyl)phthalate	46.4%	1100	50,000*	0	120 J	N	1100	N	190 J	430 J	530	360 U	420 U	380 U	790 U
Di-n-octylphthalate	0.0%	0	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Benzo(b)fluoranthene	10.7%	81	1100	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
benzo(k)fluoranthene	10.7%	96	1100	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Benzo(a)pyrene	3.6%	76	61 or MDL	1	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	750 U	N	700 U	N	870 U	800 U	390 U	360 U	420 U	380 U	790 U

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TABLE 2-9

PAD J
SUMMARY OF COMPOUNDS DETECTED
BERM EXCAVATIONS, PAD BORINGS,
& GEOPHYSICAL ANOMALY EXCAVATIONS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	PAD-J 0-6" 01/17/92 PBJ-7-1	PAD-J 0-6" 01/17/92 PBJ-7-1RE	PAD-J 0-2' 01/17/92 PBJ-7-2	PAD-J 0-2' 01/17/92 PBJ-7-2RE	PAD-J 0-6" 01/17/92 PBJ-8-1	PAD-J 0-2' 01/17/92 PBJ-8-2	OB 0-2 01/13/93 PBJ-9-1	OB 2-4 01/13/93 PBJ-9-2	OB 0-2 01/12/93 PBJ-10-1	OB 4-5 01/12/93 PBJ-10-3	GAE-J 1.0' 12/11/91 GAE-J-1
Pesticides/PCBs (ug/kg)															
beta-BHC	0.0%	0	200	0	18 U	N	17 U	N	21 U	19 U	2 U	1.9 U	2.1 U	2 U	19 U
delta-BHC	0.0%	0	300	0	18 U	N	17 U	N	21 U	19 U	2 U	1.9 U	2.1 U	2 U	19 U
gamma-BHC (Lindane)	0.0%	0	60	0	18 U	N	17 U	N	21 U	19 U	2 U	1.9 U	2.1 U	2 U	19 U
Heptachlor	0.0%	0	100	0	18 U	N	17 U	N	21 U	19 U	2 U	1.9 U	2.1 U	2 U	19 U
Aldrin	0.0%	0	41	0	18 U	N	17 U	N	21 U	19 U	2 U	1.9 U	2.1 U	2 U	19 U
Heptachlor epoxide	0.0%	0	20	0	18 U	N	17 U	N	21 U	19 U	2 U	1.9 U	2.1 U	2 U	19 U
Endosulfan I	0.0%	0	900	0	18 U	N	17 U	N	21 U	19 U	2 U	1.9 U	2.1 U	2 U	19 U
Dieldrin	0.0%	0	44	0	36 U	N	34 U	N	42 U	39 U	3.9 U	3.6 U	4.2 U	3.8 U	38 U
4,4'-DDE	46.9%	830	2100	0	36 U	N	34 U	N	42 U	39 U	6.1	3.6 U	4.2 U	2.9 J	38 U
Endrin	3.1%	41	100	0	36 U	N	34 U	N	41 J	39 U	3.9 U	3.6 U	4.2 U	3.8 U	38 U
Endosulfan II	0.0%	0	900	0	36 U	N	34 U	N	42 U	39 U	3.9 U	3.6 U	4.2 U	3.8 U	38 U
4,4'-DDD	0.0%	0	2900	0	36 U	N	34 U	N	42 U	39 U	3.9 U	3.6 U	4.2 U	3.8 U	38 U
Endosulfan sulfate	0.0%	0	1000	0	36 U	N	34 U	N	42 U	39 U	3.9 U	3.6 U	4.2 U	3.8 U	38 U
4,4'-DDT	25.0%	320	2100	0	36 U	N	34 U	N	42 U	39 U	2.8 J	3.6 U	4.2 U	3.8 U	38 U
Endrin aldehyde	0.0%	0		NA	N	N	N	N	N	N	3.9 U	3.6 U	4.2 U	3.8 U	N
alpha-Chlordane	0.0%	0	540	NA	180 U	N	170 U	N	210 U	190 U	2 U	1.9 U	2.1 U	2 U	190 U
Aroclor-1254	0.0%	0	1000	NA	360 U	N	340 U	N	420 U	390 U	39 U	36 U	42 U	38 U	380 U
Aroclor-1260	0.0%	0	1000	NA	360 U	N	340 U	N	420 U	390 U	39 U	36 U	42 U	38 U	380 U
Explosives (ug/kg)															
HMX	0.0%	0		NA	1000 U J	N	1000 U	N	1000 U J	1000 U	120 U	120 U	120 U	120 U	1000 U
RDX	3.6%	270		NA	120 U J	N	120 U	N	120 U J	120 U	120 U	120 U	120 U	120 U	120 U
1,3,5-Trinitrobenzene	3.6%	120		NA	120 U J	N	120 U	N	120 U J	120 U	120 U	120 U	120 U	120 U	120 U
1,3-Dinitrobenzene	0.0%	0		NA	120 U J	N	120 U	N	120 U J	120 U	120 U	120 U	120 U	120 U	120 U
Tetryl	0.0%	0		NA	400 U J	N	400 U	N	400 U J	400 U	120 U	120 U	120 U	120 U	400 U
2,4,6-Trinitrotoluene	0.0%	0		NA	120 U J	N	120 U	N	120 U J	120 U	120 U	120 U	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	0.0%	0		NA	120 U J	N	120 U	N	120 U J	120 U	120 U	120 U	120 U	120 U	120 U
2-amino-4,6-Dinitrotoluene	0.0%	0		NA	120 U J	N	120 U	N	120 U J	120 U	120 U	120 U	120 U	120 U	120 U
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U J	N	120 U	N	120 U J	120 U	120 U	120 U	120 U	120 U	120 U
2,4-Dinitrotoluene	42.9%	420		NA	120 U J	N	120 U	N	71 J	120 U	120 U	120 U	120 U	120 U	120 U
Metals (mg/kg)															
Aluminum	100.0%	30200	17503.0	13	21900 J	N	17900 J	N	15700 J	14200 J	11900	10200	13300	13400	30200
Antimony	25.0%	15.3	5	7	10.3 J	N	5.7 U J	N	8.7 J	6.9 U J	6.1 UJ	5.5 UJ	6.1 UJ	5.8 UJ	8.2 U R
Arsenic	89.3%	8.1	7.5	2	5.6	N	5.1	N	4.7	4.9	4.8 J	6.2 J	4.4 J	4.4 J	6.2 J
Barium	75.0%	34400	300	18	10300 J	N	6130 J	N	7010 J	307 R	407	112	91.7	116	700 J
Beryllium	42.9%	0.78	1	0	0.78	N	0.64	N	0.66	0.7	0.58	0.5 J	0.59	0.59	1.1 R
Cadmium	89.3%	10	1.8	23	4.5	N	3.9	N	7	4.3	0.35 U	0.4 J	0.35 U	0.33 U	3.7
Calcium	100.0%	71300	46825.0	2	31000 J	N	28500 J	N	29800 J	7060 J	12700	70400	71300	35800	4140 J
Chromium	92.9%	52.7	26.6	18	32.1 J	N	27.8 J	N	26.9 J	18.3 J	19.6	16.3	19.2	24.2	33.7
Cobalt	100.0%	33.4	30	2	9.4	N	10.4	N	7.7	9.7	10.6	7.1	8.5	16.6	23
Copper	85.7%	6560	25	24	182	N	108 J	N	155	108 J	31.5 R	19.3 R	19.5 R	23 R	27.6 J
Iron	100.0%	95800	32698.0	12	31400	N	29800	N	25500	37100	23600	18700	24700	29900	33700 J
Lead	89.3%	2040	30	21	1370	N	453	N	317	34.9 R	28.8 J	17.2 J	20.2	25.2 J	50.4
Magnesium	100.0%	24100	9071.1	15	16600 J	N	13600 J	N	7970 J	4610 J	5470	9190	17400	7090	7050
Manganese	100.0%	1320	1065.8	1	536	N	423	N	533	645	401	308	474	512	646
Mercury	57.1%	1.1	0.1	13	0.02 J	N	0.02 J	N	0.33	1.1	0.15	0.11	0.11	0.08	0.74
Nickel	100.0%	57.3	41.3	13	47.6	N	46.9	N	31.4	24.9	34.3	26.5	29.4	46.1	31.8
Potassium	100.0%	3500	1529.6	14	1910	N	1360	N	1470	1210	1000	1020	902	822	3500
Selenium	60.7%	1.1	2	0	0.98 U J	N	0.2 J	N	0.21 U J	0.16 U J	0.24 J	0.2 UJ	0.23 UJ	0.23 UJ	0.31 J
Silver	32.1%	1.2	0.6	6	0.98 U	N	0.93 U	N	1.2 U	1.1 U	0.36 U	0.33 U	0.36 U	0.35 U	1.3 U
Sodium	78.6%	376	76	18	157 J	N	89.3 J	N	41.4 U	39.7 U	67.9 J	129 J	167 J	92 J	84.9 J
Thallium	39.3%	38	0.3	11	0.47 U	N	0.45 U	N	0.5 U	0.48 J	0.52 U	0.47 U	0.54 U	0.55 U	0.62 U
Vanadium	100.0%	41.6	150	0	21	N	17.3	N	19	23.1	19.8	15.5	20.3	17.5	41.6
Zinc	100.0%	5790	89.1	28	2170 J	N	3180 J	N	1840 J	333 J	91.4 J	70.8 J	62.3 J	56.2 J	139 J
Cyanide	0.0%	0	NA	NA	0.68 U	N	0.64 U	N	0.63 U	0.57 U	0.7 U	0.67 U	0.76 U	0.69 U	0.54 U

NOTES:
a) * = As per proposed TAGM, Total VOCs <10 ppm, Total Semi-VOCs <500 ppm, Individual Semi-VOCs <50 ppm
For certain metals, the TAGM is equal to the greater value between the proposed TAGM and site background
The number of samples above the TAGM was determined by comparison to the actual number given, not the MDL.
b) The TAGM for 1,2-Dichloroethene (trans) was used for 1,2-Dichloroethene (total) since it was the only value available
c) NA = not applicable
d) N = Compound was not analyzed.
e) U = Compound was not detected.
f) J = The reported value is an estimated concentration.
g) R = The data was rejected in the data validation process.
h) SB = Site background
i) MDL = Method detection limit

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GB-01 0-6" 12/03/91 GB01-1	GB-01 2-4' 12/03/91 GB01-3	GB-02 0-6" 12/04/91 GB02-1	GB-02 O-2' 12/04/91 GB02-2	GB-02 4-6' 12/04/91 GB02-4	GB-2 0-2' 12/04/91 GB02-4RE	GB-03 0-6" 12/05/91 GB03-1	GB-03 0-2' 12/04/91 GB03-2	GB-3 0-2' 12/04/91 GB03-2RE	GB-04 0-6" 12/06/91 GB04-1	GB-04 6' + 12/05/91 GB04-5	GB-05 0-6" 12/06/91 GB05-1
VOCs (ug/kg)																
Methylene Chloride	2.1%	4	100	0	7 U	6 U	6 U	6 U	6 U	N	6 U	6 U	N	6 U	6 U	6 U
Acetone	0.0%	0	200	0	13 U	11 U	13 U	12 U	11 U	N	11 U	12 U	N	12 U	12 U	12 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	7 U	6 U	6 U	6 U	6 U	N	6 U	6 U	N	6 U	6 U	6 U
Chloroform	5.3%	13	300	0	7 U	6 U	6 U	6 U	10	N	6 U	6 U	N	6 U	6 U	6 U
2-Butanone	0.0%	0	300	0	13 U	11 U	13 U	12 U	11 U	N	11 U	12 U	N	12 U	12 U	12 U
1,1,1-Trichloroethane	0.0%	0	800	0	7 U	6 U	6 U	6 U	6 U	N	6 U	6 U	N	6 U	6 U	6 U
Carbon Tetrachloride	0.0%	0	600	0	7 U	6 U	6 U	6 U	6 U	N	6 U	6 U	N	6 U	6 U	6 U
Trichloroethene	3.2%	100	700	0	7 U	6 U	6 U	6 U	6 U	N	6 U	6 U	N	6 U	6 U	6 U
Benzene	0.0%	0	60	0	7 U	6 U	6 U	6 U	6 U	N	6 U	6 U	N	6 U	6 U	6 U
Tetrachloroethene	5.3%	15	1400	0	7 U	6 U	6 U	6 U	6 U	N	6 U	6 U	N	6 U	6 U	6 U
Toluene	3.2%	3	1500	0	7 U	6 U	6 U	6 U	6 U	N	6 U	6 U	N	6 U	6 U	6 U
Chlorobenzene	0.0%	0	1700	0	7 U	6 U	6 U	6 U	6 U	N	6 U	6 U	N	6 U	6 U	6 U
Xylene (total)	0.0%	0	1200	0	7 U	6 U	6 U	6 U	6 U	N	6 U	6 U	N	6 U	6 U	6 U
Semivolatiles (ug/kg)																
Phenol	0.0%	0	30 or MDL	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
2-Methylphenol	0.0%	0	100 or MDL	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
4-Methylphenol	0.0%	0	900	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
Benzoic acid	0.0%	0	2700	0	3800 U	3500 U	3900 U J	3800 U	3700 U R	3700 U J	3700 U	3500 U R	1700 U J	3800 U	3600 U	3900 U
Naphthalene	0.0%	0	13,000	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
2-Methylnaphthalene	0.0%	0	36,400	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
2-Chloronaphthalene	0.0%	0	50,000*	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
2-Nitroaniline	0.0%	0	430 or MDL	0	3800 U	3500 U	3900 U J	3800 U	3700 U R	3700 U J	3700 U	3500 U R	1700 U J	3800 U	3600 U	3900 U
Acenaphthylene	0.0%	0	41,000	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
2,6-Dinitrotoluene	6.1%	340	1000	0	780 U	730 U	790 U J	790 U	770 U R	200 J	340 J	730 U R	110 J	780 U	750 U	800 U
3-Nitroaniline	0.0%	0	500 or MDL	0	3800 U	3500 U	3900 U J	3800 U	3700 U R	3700 U J	3700 U	3500 U R	1700 U J	3800 U	3600 U	3900 U
Acenaphthene	0.0%	0	50,000*	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
Dibenzofuran	0.0%	0	6200	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
2,4-Dinitrotoluene	13.1%	4200	50,000*	0	780 U	730 U	2000 J	790 U	770 U R	4200 J	7000	730 U R	2200 J	780 U	750 U	800 U
Diethylphthalate	11.1%	94	7100	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
Fluorene	0.0%	0	50,000*	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
N-Nitrosodiphenylamine	10.1%	1000	50,000*	0	780 U	730 U	340 J	790 U	770 U R	1000 J	1000	730 U R	510 J	780 U	750 U	800 U
Hexachlorobenzene	3.0%	90	410	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
Pentachlorophenol	1.0%	140	1000 or MDL	0	3800 U	3500 U	3900 U J	3800 U	3700 U R	3700 U J	3700 U	3500 U R	1700 U J	3800 U	3600 U	3900 U
Phenanthrene	1.0%	290	50,000*	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	290 J
Anthracene	1.0%	18	50,000*	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
Carbazole	0.0%	0	50,000*	0	N	N	N	N	N	N	N	N	N	N	N	N
Di-n-butylphthalate	32.3%	1500	8100	0	780 U	730 U	1100 J	790 U	770 U R	1400 J	840	730 U R	1400 J	780 U	750 U	800 U
Fluoranthene	3.0%	480	50,000*	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	480 J
Pyrene	3.0%	300	50,000*	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	300 J
Butylbenzylphthalate	1.0%	64	50,000*	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
Benzo(a)anthracene	1.0%	200	220 or MDL	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	200 J
Chrysene	1.0%	250	400	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	250 J
bis(2-Ethylhexyl)phthalate	37.4%	1400	50,000*	0	780 U	780	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
Di-n-octylphthalate	1.0%	19	50,000*	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
Benzo(b)fluoranthene	1.0%	180	1100	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	180 J
benzo(k)fluoranthene	1.0%	190	1100	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	190 J
Benzo(a)pyrene	1.0%	150	61 or MDL	1	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	150 J
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	780 U	730 U	790 U J	790 U	770 U R	770 U J	760 U	730 U R	360 U J	780 U	750 U	800 U

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GB-01 0-6" 12/03/91 GB01-1	GB-01 2-4' 12/03/91 GB01-3	GB-02 0-6" 12/04/91 GB02-1	GB-02 0-2' 12/04/91 GB02-2	GB-02 4-6' 12/04/91 GB02-4	GB-2 0-2' 12/04/91 GB02-4RE	GB-03 0-6" 12/05/91 GB03-1	GB-03 0-2' 12/04/91 GB03-2	GB-3 0-2' 12/04/91 GB03-2RE	GB-04 0-6" 12/06/91 GB04-1	GB-04 6' + 12/05/91 GB04-5	GB-05 0-6" 12/06/91 GB05-1
Pesticides/PCBs (ug/kg)																
beta-BHC	0.0%	0	200	0	19 U	18 U	19 U	19 U	19 U	N	19 U	18 U	N	19 U	18 U	19 U
delta-BHC	0.0%	0	300	0	19 U	18 U	19 U	19 U	19 U	N	19 U	18 U	N	19 U	18 U	19 U
gamma-BHC (Lindane)	0.0%	0	60	0	19 U	18 U	19 U	19 U	19 U	N	19 U	18 U	N	19 U	18 U	19 U
Heptachlor	0.0%	0	100	0	19 U	18 U	19 U	19 U	19 U	N	19 U	18 U	N	19 U	18 U	19 U
Aldrin	1.1%	2.5	41	0	19 U	18 U	19 U	19 U	19 U	N	19 U	18 U	N	19 U	18 U	19 U
Heptachlor epoxide	0.0%	0	20	0	19 U	18 U	19 U	19 U	19 U	N	19 U	18 U	N	19 U	18 U	19 U
Endosulfan I	1.1%	1.3	900	0	19 U	18 U	19 U	19 U	19 U	N	19 U	18 U	N	19 U	18 U	19 U
Dieldrin	0.0%	0	44	0	38 U	35 U	39 U	38 U	37 U	N	37 U	35 U	N	38 U	36 U	39 U
4,4'-DDE	5.4%	32	2100	0	38 U	35 U	39 U	38 U	37 U	N	32 J	35 U	N	38 U	36 U	39 U
Endrin	0.0%	0	100	0	38 U	35 U	39 U	38 U	37 U	N	37 U	35 U	N	38 U	36 U	39 U
Endosulfan II	0.0%	0	900	0	38 U	35 U	39 U	38 U	37 U	N	37 U	35 U	N	38 U	36 U	39 U
4,4'-DDD	1.1%	4.2	2900	0	38 U	35 U	39 U	38 U	37 U	N	37 U	35 U	N	38 U	36 U	39 U
Endosulfan sulfate	0.0%	0	1000	0	38 U	35 U	39 U	38 U	37 U	N	37 U	35 U	N	38 U	36 U	39 U
4,4'-DDT	2.2%	5.3	2100	0	38 U	35 U	39 U	38 U	37 U	N	37 U	35 U	N	38 U	36 U	39 U
Endrin aldehyde	0.0%	0		NA	N	N	N	N	N	N	N	N	N	N	N	N
alpha-Chlordane	0.0%	0	540	0	190 U	180 U	190 U	190 U	190 U	N	190 U	180 U	N	190 U	180 U	190 U
Aroclor-1254	1.1%	430	1000	0	380 U	350 U	390 U	380 U	370 U	N	370 U	350 U	N	380 U	360 U	390 U
Aroclor-1260	1.1%	240	1000	0	380 U	350 U	390 U	380 U	370 U	N	370 U	350 U	N	380 U	360 U	390 U
Explosives (ug/kg)																
HMX	1.1%	75		NA	1000 U	1000 U	1000 U	1000 U	1200 U J	950 U J	1000 U	1100 U J	980 U J	1000 U	980 U	1000 U
RDX	4.4%	240		NA	120 U	120 U	120 U	120 U	150 U J	120 U J	120 U	140 U J	120 U J	120 U	120 U	120 U
1,3,5-Trinitrobenzene	7.8%	280		NA	120 U	120 U	82 J	120 U	150 U J	120 U J	184	280 J	150 J	120 U	120 U	120 U
1,3-Dinitrobenzene	0.0%	0		NA	120 U	120 U	120 U	120 U	150 U J	120 U J	120 U	140 U J	120 U J	120 U	120 U	120 U
Tetryl	0.0%	0		NA	400 U	400 U	400 U	400 U	470 U J	380 U J	400 U	440 U J	390 U J	400 U	390 U	400 U
2,4,6-Trinitrotoluene	5.6%	350		NA	120 U	120 U	120 U	120 U	150 U J	120 U J	150	69 J	120 U J	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	10.0%	430		NA	120 U	120 U	120 U	120 U	150 U J	120 U J	370	280 J	200 J	120 U	120 U	120 U
2-amino-4,6-Dinitrotoluene	13.3%	370		NA	120 U	120 U	85 J	73 J	150 U J	120 U J	370	300 J	200 J	120 U	120 U	120 U
2,6-Dinitrotoluene	1.1%	67	1000	0	120 U	120 U	120 U	120 U	150 U J	120 U J	120 U	140 U J	120 U J	67 J	120 U	120 U
2,4-Dinitrotoluene	13.3%	2400		NA	120 U	120 U	270	120 U	150 U J	120 U J	940	850 J	630 J	120 U	120 U	120 U
Metals (mg/kg)																
Aluminum	100.0%	25300	17503.0	33	12900	17500	20900	19000	16600	N	18600	14700	N	18500	15400	16100
Antimony	13.2%	26.6	5	12	12.7 U R	11.4 U R	19.6 R	13.4 U R	10.4 U R	N	6.8 U R	9.8 U R	N	8 U R	11.5 U R	8.2 U R
Arsenic	98.9%	18.5	7.5	8	6.6	4.7	18.5	5.3	3.8	N	4.9	6.1	N	5.1	3.8	5.8
Barium	91.2%	4520	300	15	226	365	2290	906	72.8	N	924	819	N	131	63.6	227
Beryllium	61.5%	1.1	1	1	0.9 R	1.1 R	0.88 R	1.2 R	1.1 R	N	0.83 R	0.9 R	N	0.91 R	1 R	0.7 R
Cadmium	56.0%	7	1.8	44	2.2	2.4	5.9	2.3	2.5	N	3.7	3.5	N	2.4	2.6	3.7
Calcium	100.0%	99000	46825.0	14	11200	10000	8270	6250	5050	N	17500	22200	N	17700	2160	61600
Chromium	100.0%	35.4	26.6	38	21.6	28.3	34.9	27.7	29.5	N	33.3	29.7	N	27.9	28.6	31.6
Cobalt	100.0%	26.6	30	0	10.4 J	9.2 J	12.8	9.5 J	19.3	N	13.4	10.6	N	15.1	15.9	11.8
Copper	100.0%	1680	25	72	1010	256	1060	399	42.8	N	109	108	N	34.1	34.5	730
Iron	100.0%	39700	32698.0	23	26700	32100	37700	28800	35800	N	30100	27600	N	32200	34100	26700
Lead	94.5%	6230	30	48	630	481	5310	3400	27.9	N	194	252	N	36.1	18.1	167
Magnesium	100.0%	16000	9071.1	10	5150	6060	7190	5870	7200	N	6620	6070	N	7290	7010	11200
Manganese	100.0%	1650	1065.8	6	360	449	597	380	466	N	611	499	N	516	336	503
Mercury	71.4%	1.1	0.1	18	0.13	0.04 J	0.15	0.14	0.04 U	N	0.09 J	0.14	N	0.04 U	0.04 U	0.04 U
Nickel	100.0%	76	41.3	38	33.8	39.6	45.4	34.6	62.4	N	40.1	39.1	N	47	55.5	36.6
Potassium	100.0%	3170	1529.6	35	1280	2010	2340	2030	1590	N	2360	1760	N	2540	1580	2150
Selenium	40.7%	1.5	2	0	0.16 U J	0.16 U J	0.91 J	1 U J	0.13 U J	N	0.16 U J	0.42 J	N	0.12 U J	0.22 U J	0.24 U J
Silver	7.7%	3.7	0.6	3	2.1 U	1.9 U	1.6 U	2.2 U	1.7 U	N	1.1 U	1.6 J	N	1.3 U	1.9 U	1.3 U
Sodium	72.5%	227	76	36	73.5 U	66.2 U	160 J	130 J	72.3 J	N	82.2 J	98.8 J	N	78.9 J	66.7 U	160 J
Thallium	9.9%	0.8	0.3	9	0.5 U	0.5 U	0.44 U	0.67 U	0.42 U	N	0.5 U	0.63 U	N	0.38 U	0.71 U	0.75 U
Vanadium	100.0%	38.6	150	0	20.4	28.1	26.7	29.7	24.2	N	25.8	18.1	N	27.3	19.8	25.7
Zinc	100.0%	1200	89.1	58	383	163	780	210	94.9	N	676	445	N	141	51	332
Cyanide	1.1%	2.6	NA	NA	0.67 U	0.61 U	0.7 U	0.62 U	0.51 U	N	0.65 U	0.58 U	N	0.65 U	0.6 U	0.62 U

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GB-05 0-2' 12/05/91 GB05-2	GB-05 2-4' 12/05/91 GB-5-3	GB-06 0-6" 12/06/91 GB06-1	GB-06 6' 12/06/91 GB06-5	GB-07 0-6" 12/09/91 GB-07-1	GB-7 0-6" 12/09/91 GB-07-1RE	GB-07 0-2' 12/09/91 GB-07-2	GB-08 0-6" 12/09/91 GB-08-1	GB-08 0-6" 12/09/91 GB-08-1RE	GB-08 4-6' 12/09/91 GB-08-4	GB-09 0-6" 12/10/91 GB-09-1	GB-9 0-6" 12/10/91 GB-09-1RE
VOC's (ug/kg)																
Methylene Chloride	2.1%	4	100	0	6 U	N	6 U	6 U	6 U	N	6 U	6 U J	6 U J	6 U	6 U	N
Acetone	0.0%	0	200	0	12 U	N	12 U	13 U	11 U	N	12 U	12 U J	12 U J	11 U	12 U	N
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U	N	6 U	6 U	6 U	N	6 U	6 U J	6 U J	6 U	6 U	N
Chloroform	5.3%	13	300	0	6 U	N	6 U	6 U	6 U	N	6 U	13 J	6 U J	6 U	6 U	N
2-Butanone	0.0%	0	300	0	12 U	N	12 U	13 U	11 U	N	12 U	12 U J	12 U J	11 U	12 U	N
1,1,1-Trichloroethane	0.0%	0	800	0	6 U	N	6 U	6 U	6 U	N	6 U	6 U J	6 U J	6 U	6 U	N
Carbon Tetrachloride	0.0%	0	600	0	6 U	N	6 U	6 U	6 U	N	6 U	6 U J	6 U J	6 U	6 U	N
Trichloroethene	3.2%	100	700	0	6 U	N	6 U	6 U	6 U	N	6 U	6 U J	6 U J	6 U	6 U	N
Benzene	0.0%	0	60	0	6 U	N	6 U	6 U	6 U	N	6 U	6 U J	6 U J	6 U	6 U	N
Tetrachloroethene	5.3%	15	1400	0	6 U	N	6 U	6 U	6 U	N	6 U	2 J	13 J	6 U	6 U	N
Toluene	3.2%	3	1500	0	6 U	N	6 U	6 U	6 U	N	6 U	6 U J	6 U J	6 U	6 U	N
Chlorobenzene	0.0%	0	1700	0	6 U	N	6 U	6 U	6 U	N	6 U	6 U J	6 U J	6 U	6 U	N
Xylene (total)	0.0%	0	1200	0	6 U	N	6 U	6 U	6 U	N	6 U	6 U J	6 U J	6 U	6 U	N
Semivolatiles (ug/kg)																
Phenol	0.0%	0	30 or MDL	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
2-Methylphenol	0.0%	0	100 or MDL	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
4-Methylphenol	0.0%	0	900	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
2,4-Dimethylphenol	0.0%	0	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Benzoic acid	0.0%	0	2700	0	3700 U	N	3800 U	3900 U	4000 U R	2000 U J	3700 U	4100 U R	2000 U J	3700 U	4000 U R	2000 U J
Naphthalene	0.0%	0	13,000	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
2-Methylnaphthalene	0.0%	0	36,400	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
2-Chloronaphthalene	0.0%	0	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
2-Nitroaniline	0.0%	0	430 or MDL	0	3700 U	N	3800 U	3900 U	4000 U R	2000 U J	3700 U	4100 U R	2000 U J	3700 U	4000 U R	2000 U J
Acenaphthylene	0.0%	0	41,000	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
2,6-Dinitrotoluene	6.1%	340	1000	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
3-Nitroaniline	0.0%	0	500 or MDL	0	3700 U	N	3800 U	3900 U	4000 U R	2000 U J	3700 U	4100 U R	2000 U J	3700 U	4000 U R	2000 U J
Acenaphthene	0.0%	0	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Dibenzofuran	0.0%	0	6200	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
2,4-Dinitrotoluene	13.1%	4200	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	780 J	760 U	820 U R	410 U J
Diethylphthalate	11.1%	94	7100	0	760 U	N	780 U	800 U	830 U R	410 U J	94 J	840 U R	410 U J	760 U	820 U R	410 U J
Fluorene	0.0%	0	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
N-Nitrosodiphenylamine	10.1%	1000	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	260 J	760 U	820 U R	410 U J
Hexachlorobenzene	3.0%	90	410	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	90 J	760 U	820 U R	410 U J
Pentachlorophenol	1.0%	140	1000 or MDL	0	3700 U	N	3800 U	3900 U	4000 U R	2000 U J	3700 U	4100 U R	2000 U J	3700 U	4000 U R	2000 U J
Phenanthrene	1.0%	290	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Anthracene	1.0%	18	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Carbazole	0.0%	0	50,000*	0	N	N	N	N	N	N	N	N	N	N	N	N
Di-n-butylphthalate	32.3%	1500	8100	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	73 J	760 U	820 U R	410 U J
Fluoranthene	3.0%	480	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Pyrene	3.0%	300	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Butylbenzylphthalate	1.0%	64	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Benzo(a)anthracene	1.0%	200	220 or MDL	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Chrysene	1.0%	250	400	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
bis(2-Ethylhexyl)phthalate	37.4%	1400	50,000*	0	300 J	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Di-n-octylphthalate	1.0%	19	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Benzo(b)fluoranthene	1.0%	180	1100	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
benzo(k)fluoranthene	1.0%	190	1100	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Benzo(a)pyrene	1.0%	150	61 or MDL	1	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	760 U	N	780 U	800 U	830 U R	410 U J	770 U	840 U R	410 U J	760 U	820 U R	410 U J

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GB-05 0-2' 12/05/91 GB05-2	GB-05 2-4' 12/05/91 GB-5-3	GB-06 0-6" 12/06/91 GB06-1	GB-06 6'+ 12/06/91 GB06-5	GB-07 0-6" 12/09/91 GB-07-1	GB-7 0-6" 12/09/91 GB-07-1RE	GB-07 0-2' 12/09/91 GB-07-2	GB-08 0-6" 12/09/91 GB-08-1	GB-08 0-6" 12/09/91 GB-08-1RE	GB-08 4-6' 12/09/91 GB-08-4	GB-09 0-6" 12/10/91 GB-09-1	GB-9 0-6" 12/10/91 GB-09-1RE
Pesticides/PCBs (ug/kg)																
beta-BHC	0.0%	0	200	0	18 U	N	19 U	19 U	20 U	N	19 U	20 U	N	18 U	20 U	N
delta-BHC	0.0%	0	300	0	18 U	N	19 U	19 U	20 U	N	19 U	20 U	N	18 U	20 U	N
gamma-BHC (Lindane)	0.0%	0	60	0	18 U	N	19 U	19 U	20 U	N	19 U	20 U	N	18 U	20 U	N
Heptachlor	0.0%	0	100	0	18 U	N	19 U	19 U	20 U	N	19 U	20 U	N	18 U	20 U	N
Aldrin	1.1%	2.5	41	0	18 U	N	19 U	19 U	20 U	N	19 U	20 U	N	18 U	20 U	N
Heptachlor epoxide	0.0%	0	20	0	18 U	N	19 U	19 U	20 U	N	19 U	20 U	N	18 U	20 U	N
Endosulfan I	1.1%	1.3	900	0	18 U	N	19 U	19 U	20 U	N	19 U	20 U	N	18 U	20 U	N
Dieldrin	0.0%	0	44	0	37 U	N	38 U	39 U	40 U	N	37 U	41 U	N	37 U	40 U	N
4,4'-DDE	5.4%	32	2100	0	37 U	N	38 U	39 U	40 U	N	37 U	41 U	N	37 U	40 U	N
Endrin	0.0%	0	100	0	37 U	N	38 U	39 U	40 U	N	37 U	41 U	N	37 U	40 U	N
Endosulfan II	0.0%	0	900	0	37 U	N	38 U	39 U	40 U	N	37 U	41 U	N	37 U	40 U	N
4,4'-DDD	1.1%	4.2	2900	0	37 U	N	38 U	39 U	40 U	N	37 U	41 U	N	37 U	40 U	N
Endosulfan sulfate	0.0%	0	1000	0	37 U	N	38 U	39 U	40 U	N	37 U	41 U	N	37 U	40 U	N
4,4'-DDT	2.2%	5.3	2100	0	37 U	N	38 U	39 U	40 U	N	37 U	41 U	N	37 U	40 U	N
Endrin aldehyde	0.0%	0		NA	N	N	N	N	N	N	N	N	N	N	N	N
alpha-Chlordane	0.0%	0	540	0	180 U	N	190 U	190 U	200 U	N	190 U	200 U	N	180 U	200 U	N
Aroclor-1254	1.1%	430	1000	0	370 U	N	380 U	390 U	400 U	N	370 U	410 U	N	370 U	400 U	N
Aroclor-1260	1.1%	240	1000	0	370 U	N	380 U	390 U	400 U	N	370 U	240 J	N	370 U	400 U	N
Explosives (ug/kg)																
HMX	1.1%	75		NA	970 U	N	1000 U	960 U	1000 U	N	N	1000 U	N	N	1000 U	N
RDX	4.4%	240		NA	120 U	N	120 U	120 U	120 U	N	N	120 U	N	N	120 U	N
1,3,5-Trinitrobenzene	7.8%	280		NA	120 U	N	120 U	120 U	120 U	N	N	120 U	N	N	120 U	N
1,3-Dinitrobenzene	0.0%	0		NA	120 U	N	120 U	120 U	120 U	N	N	120 U	N	N	120 U	N
Tetryl	0.0%	0		NA	390 U	N	400 U	380 U	400 U	N	N	400 U	N	N	400 U	N
2,4,6-Trinitrotoluene	5.6%	350		NA	120 U	N	120 U	120 U	120 U	N	N	120 U	N	N	120 U	N
4-amino-2,6-Dinitrotoluene	10.0%	430		NA	120 U	N	120 U	120 U	120 U	N	N	86 J	N	N	120 U	N
2-amino-4,6-Dinitrotoluene	13.3%	370		NA	120 U	N	120 U	120 U	120 U	N	N	94 J	N	N	120 U	N
2,6-Dinitrotoluene	1.1%	67	1000	0	120 U	N	120 U	120 U	120 U	N	N	120 U	N	N	120 U	N
2,4-Dinitrotoluene	13.3%	2400		NA	120 U	N	120 U	120 U	120 U	N	N	120 U	N	N	120 U	N
Metals (mg/kg)																
Aluminum	100.0%	25300	17503.0	33	N	10100	21200	18300	17100	N	12800	16800	N	16500	17700	N
Antimony	13.2%	26.6	5	12	N	12.6 U R	6.7 U R	12 U R	13.1 U R	N	11.4 U R	13.1 U R	N	11.3 U R	13.3 U R	N
Arsenic	98.9%	18.5	7.5	8	N	3.1	5.2	4.6	5.9	N	2.8	4.8	N	4.1	4.6	N
Barium	91.2%	4520	300	15	N	73.9	103	94.1	199	N	69.2	348	N	169	131	N
Beryllium	61.5%	1.1	1	1	N	0.81 R	0.75 R	1.2 R	1.4 R	N	0.9 R	1.2 R	N	1.1 R	1.2 R	N
Cadmium	56.0%	7	1.8	44	N	1.8	1.8	2.8	2.7	N	1.8	3.2	N	2	3.2	N
Calcium	100.0%	99000	46825.0	14	N	90400	2580	22700	11100	N	83500	5490	N	31700	6040	N
Chromium	100.0%	35.4	26.6	38	N	18.1	23.2	31.6	26.1	N	21.9	26.1	N	24.5	25.2	N
Cobalt	100.0%	26.6	30	0	N	6.1 J	10.2	25.9	21.7	N	10.9	11 J	N	8.8 J	11.9 J	N
Copper	100.0%	1680	25	72	N	16	15.7	37.3	74.5	N	26.5	91.3	N	37.8	77.8	N
Iron	100.0%	39700	32698.0	23	N	19700	26900	39700	36800	N	25100	32200	N	27900	32000	N
Lead	94.5%	6230	30	48	N	12.4	12.4	22	110	N	18.1	184	N	182	31.7	N
Magnesium	100.0%	16000	9071.1	10	N	9360	4360	7720	8270	N	13300	5380	N	6950	5500	N
Manganese	100.0%	1650	1065.8	6	N	263	242	1110	1650	N	404	533	N	471	663	N
Mercury	71.4%	1.1	0.1	18	N	0.04 U	0.05 U	0.05 U	0.07 J	N	0.05 U	0.32	N	0.11 J	0.96	N
Nickel	100.0%	76	41.3	38	N	28.3	49.6	69.3	47.3	N	36.2	37.4	N	37.2	37.9	N
Potassium	100.0%	3170	1529.6	35	N	1450	1510	1560	1540	N	1460	1900	N	2400	2050	N
Selenium	40.7%	1.5	2	0	N	0.2 J	0.15 U J	0.13 U J	0.15 U J	N	0.12 U J	0.38 J	N	0.1 U J	0.2 J	N
Silver	7.7%	3.7	0.6	3	N	2 U	1.1 U	2 U	2.1 U	N	1.8 U	2.1 U	N	1.8 U	2.2 U	N
Sodium	72.5%	227	76	36	N	142 J	54.5 J	69.5 U	76 U	N	99.4 J	75.7 U	N	92 J	77.1 U	N
Thallium	9.9%	0.8	0.3	9	N	0.52 U	0.46 U	0.41 U	0.49 U	N	0.37 U	0.68 U	N	0.32 U	0.43 U	N
Vanadium	100.0%	38.6	150	0	N	18.8	32.3	19.3	26.2	N	21	28.4	N	25	26.8	N
Zinc	100.0%	1200	89.1	58	N	56	69.9	90.8	99.4	N	71.2	404	N	123	397	N
Cyanide	1.1%	2.6	NA	NA	N	0.69 U	0.63 U	0.7 U	0.7 U	N	0.65 U	0.67 U	N	0.66 U	0.74 U	N

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GB-09 2-4' 12/10/91 GB-09-3	GB-10 0-6" 12/11/91 GB-10-1	GB-10 2-4' 12/11/91 GB-10-3	GB-11 0-6" 12/10/91 GB-11-1	GB-11 0-6" 12/10/91 GB-11-1RE	GB-11 2-4' 12/10/91 GB-11-3	GB-12 0-6" 12/16/91 GB-12-1	GB-12 0-6" 12/16/91 GB-12-1A	GB-12 0-2' 12/16/91 GB-12-2	GB-12 0-2' 12/16/91 GB-12-2RE	GB-12 0-2' 12/16/91 GB-12-2A	GB-13 0-6" 01/23/92 GB-13-1
VOCs (ug/kg)																
Methylene Chloride	2.1%	4	100	0	6 U	6 U	6 U	6 U	N	5 U	6 U	6 U	6 U	N	6 U	9 U
Acetone	0.0%	0	200	0	11 U	12 U	12 U	13 U	N	11 U	12 U	12 U	12 U	N	13 U	18 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U	6 U	6 U	6 U	N	5 U	6 U	6 U	6 U	N	6 U	9 U
Chloroform	5.3%	13	300	0	6 U	6 U	6 U	6 U	N	5 U	6 U	8	6 U	N	6 U	9 U
2-Butanone	0.0%	0	300	0	11 U	12 U	12 U	13 U	N	11 U	12 U	12 U	12 U	N	13 U	18 U
1,1,1-Trichloroethane	0.0%	0	800	0	6 U	6 U	6 U	6 U	N	5 U	6 U	6 U	6 U	N	6 U	9 U
Carbon Tetrachloride	0.0%	0	600	0	6 U	6 U	6 U	6 U	N	5 U	6 U	6 U	6 U	N	6 U	9 U
Trichloroethene	3.2%	100	700	0	6 U	6 U	6 U	6 U	N	5 U	6 U	3 J	6 U	N	6 U	9 U
Benzene	0.0%	0	60	0	6 U	6 U	6 U	6 U	N	5 U	6 U	6 U	6 U	N	6 U	9 U
Tetrachloroethene	5.3%	15	1400	0	6 U	6 U	6 U	6 U	N	5 U	6 U	3 J	6 U	N	6 U	9 U
Toluene	3.2%	3	1500	0	6 U	6 U	6 U	6 U	N	5 U	6 U	6 U	6 U	N	6 U	9 U
Chlorobenzene	0.0%	0	1700	0	6 U	6 U	6 U	6 U	N	5 U	6 U	6 U	6 U	N	6 U	9 U
Xylene (total)	0.0%	0	1200	0	6 U	6 U	6 U	6 U	N	5 U	6 U	6 U	6 U	N	6 U	9 U
Semivolatiles (ug/kg)																
Phenol	0.0%	0	30 or MDL	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U J	810 U R	790 U	1000 U
2-Methylphenol	0.0%	0	100 or MDL	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U J	810 U R	790 U	1000 U
4-Methylphenol	0.0%	0	900	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U J	810 U R	790 U	1000 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U J	810 U R	790 U	1000 U
Benzoic acid	0.0%	0	2700	0	3600 U	3800 U	3500 U	4100 U J	2000 U R	3400 U	3800 U	4000 U	3900 U J	3900 U R	3900 U	5000 U
Naphthalene	0.0%	0	13,000	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U J	810 U R	790 U	1000 U
2-Methylnaphthalene	0.0%	0	36,400	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U J	810 U R	790 U	1000 U
2-Chloronaphthalene	0.0%	0	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U J	810 U R	790 U	1000 U
2-Nitroaniline	0.0%	0	430 or MDL	0	3600 U	3800 U	3500 U	4100 U J	2000 U R	3400 U	3800 U	4000 U	3900 U J	3900 U R	3900 U	5000 U
Acenaphthylene	0.0%	0	41,000	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U J	810 U R	790 U	1000 U
2,6-Dinitrotoluene	6.1%	340	1000	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U J	810 U R	790 U	1000 U
3-Nitroaniline	0.0%	0	500 or MDL	0	3600 U	3800 U	3500 U	4100 U J	2000 U R	3400 U	3800 U	4000 U	3900 U	3900 U R	3900 U	5000 U
Acenaphthene	0.0%	0	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Dibenzofuran	0.0%	0	6200	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
2,4-Dinitrotoluene	13.1%	4200	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	130 J	820 U	810 U	810 U R	790 U	260 J
Diethylphthalate	11.1%	94	7100	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Fluorene	0.0%	0	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
N-Nitrosodiphenylamine	10.1%	1000	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	130 J
Hexachlorobenzene	3.0%	90	410	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Pentachlorophenol	1.0%	140	1000 or MDL	0	3600 U	3800 U	3500 U	4100 U J	2000 U R	3400 U	3800 U	4000 U	3900 U	3900 U R	3900 U	5000 U
Phenanthrene	1.0%	290	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Anthracene	1.0%	18	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Carbazole	0.0%	0	50,000*	0	N	N	N	N	N	N	N	N	N	N	N	N
Di-n-butylphthalate	32.3%	1500	8100	0	730 U	790 U	730 U	850 U J	420 U R	700 U	490 J	460 J	86 J	810 U R	180 J	1000 U
Fluoranthene	3.0%	480	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Pyrene	3.0%	300	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Butylbenzylphthalate	1.0%	64	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Benzo(a)anthracene	1.0%	200	220 or MDL	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Chrysene	1.0%	250	400	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
bis(2-Ethylhexyl)phthalate	37.4%	1400	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	260 J	820 U	810 U	810 U R	790 U	520 J
Di-n-octylphthalate	1.0%	19	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Benzo(b)fluoranthene	1.0%	180	1100	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
benzo(k)fluoranthene	1.0%	190	1100	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Benzo(a)pyrene	1.0%	150	61 or MDL	1	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	730 U	790 U	730 U	850 U J	420 U R	700 U	790 U	820 U	810 U	810 U R	790 U	1000 U

TABLE 2-10

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SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GB-09 2-4' 12/10/91 GB-09-3	GB-10 0-6" 12/11/91 GB-10-1	GB-10 2-4' 12/11/91 GB-10-3	GB-11 0-6" 12/10/91 GB-11-1	GB-11 0-6" 12/10/91 GB-11-1RE	GB-11 2-4' 12/10/91 GB-11-3	GB-12 0-6" 12/16/91 GB-12-1	GB-12 0-6" 12/16/91 GB-12-1A	GB-12 0-2' 12/16/91 GB-12-2	GB-12 0-2' 12/16/91 GB-12-2RE	GB-12 0-2' 12/16/91 GB-12-2A	GB-13 0-6" 01/23/92 GB-13-1
Pesticides/PCBs (ug/kg)																
beta-BHC	0.0%	0	200	0	18 U	19 U	18 U	21 U	N	17 U	19 U	20 U	20 U	N	19 U	25 U J
delta-BHC	0.0%	0	300	0	18 U	19 U	18 U	21 U	N	17 U	19 U	20 U	20 U	N	19 U	25 U J
gamma-BHC (Lindane)	0.0%	0	60	0	18 U	19 U	18 U	21 U	N	17 U	19 U	20 U	20 U	N	19 U	25 U J
Heptachlor	0.0%	0	100	0	18 U	19 U	18 U	21 U	N	17 U	19 U	20 U	20 U	N	19 U	25 U J
Aldrin	1.1%	2.5	41	0	18 U	19 U	18 U	21 U	N	17 U	19 U	20 U	20 U	N	19 U	25 U J
Heptachlor epoxide	0.0%	0	20	0	18 U	19 U	18 U	21 U	N	17 U	19 U	20 U	20 U	N	19 U	25 U J
Endosulfan I	1.1%	1.3	900	0	18 U	19 U	18 U	21 U	N	17 U	19 U	20 U	20 U	N	19 U	25 U J
Dieldrin	0.0%	0	44	0	36 U	38 U	35 U	41 U	N	34 U	38 U	40 U	39 U	N	39 U	50 U J
4,4'-DDE	5.4%	32	2100	0	36 U	38 U	35 U	41 U	N	34 U	38 U	40 U	39 U	N	39 U	50 U J
Endrin	0.0%	0	100	0	36 U	38 U	35 U	41 U	N	34 U	38 U	40 U	39 U	N	39 U	50 U J
Endosulfan II	0.0%	0	900	0	36 U	38 U	35 U	41 U	N	34 U	38 U	40 U	39 U	N	39 U	50 U J
4,4'-DDD	1.1%	4.2	2900	0	36 U	38 U	35 U	41 U	N	34 U	38 U	40 U	39 U	N	39 U	50 U J
Endosulfan sulfate	0.0%	0	1000	0	36 U	38 U	35 U	41 U	N	34 U	38 U	40 U	39 U	N	39 U	50 U J
4,4'-DDT	2.2%	5.3	2100	0	36 U	38 U	35 U	41 U	N	34 U	38 U	40 U	39 U	N	39 U	50 U J
Endrin aldehyde	0.0%	0		NA	N	N	N	N	N	N	N	N	N	N	N	N
alpha-Chlordane	0.0%	0	540	0	180 U	190 U	180 U	210 U	N	170 U	190 U	200 U	200 U	N	190 U	250 U J
Aroclor-1254	1.1%	430	1000	0	360 U	380 U	350 U	410 U	N	340 U	380 U	400 U	390 U	N	390 U	500 U J
Aroclor-1260	1.1%	240	1000	0	360 U	380 U	350 U	410 U	N	340 U	380 U	400 U	390 U	N	390 U	500 U J
Explosives (ug/kg)																
HMX	1.1%	75		NA	N	1000 U	1000 U	1000 U	N	1000 U	1000 U	1000 U	1000 U	N	1000 U	1000 U J
RDX	4.4%	240		NA	N	120 U	120 U	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U J
1,3,5-Trinitrobenzene	7.8%	280		NA	N	120 U	120 U	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U J
1,3-Dinitrobenzene	0.0%	0		NA	N	120 U	120 U	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U J
Tetryl	0.0%	0		NA	N	400 U	400 U	400 U	N	400 U	400 U	400 U	400 U	N	400 U	400 U J
2,4,6-Trinitrotoluene	5.6%	350		NA	N	120 U	120 U	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U J
4-amino-2,6-Dinitrotoluene	10.0%	430		NA	N	120 U	120 U	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U J
2-amino-4,6-Dinitrotoluene	13.3%	370		NA	N	120 U	120 U	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U J
2,6-Dinitrotoluene	1.1%	67	1000	0	N	120 U	120 U	120 U	N	120 U	120 U	120 U	120 U	N	120 U	120 U J
2,4-Dinitrotoluene	13.3%	2400		NA	N	120 U	120 U	120 U	N	120 J	120 U	64 J	120 U	N	120 U	100 J
Metals (mg/kg)																
Aluminum	100.0%	25300	17503.0	33	14000	25300	16700	24600	N	18000	13200	15200	19100	N	19700	20300 J
Antimony	13.2%	26.6	5	12	11.6 U R	12.2 U R	5.4 U R	10.8 U R	N	5.4 U R	40 R	6.4 R	6 U R	N	6 U R	8.3 U J
Arsenic	98.9%	18.5	7.5	8	3.7	6.8 J	3.5 J	5.5 J	N	7.1 J	4.8 J	4.7 J	4.6 J	N	4.2 J	5.8
Barium	91.2%	4520	300	15	166	208 J	81.3 J	154 J	N	77.1 J	397 J	365 J	249 J	N	168 J	622 R
Beryllium	61.5%	1.1	1	1	0.94 R	1.1 R	0.79 R	1.3 R	N	0.97 R	0.74 R	0.87 R	0.79 R	N	0.84 R	0.97
Cadmium	56.0%	7	1.8	44	2.3	3.4	3.4	3.6	N	4	3	2.5	2.9	N	3.5	7
Calcium	100.0%	99000	46825.0	14	74700	4480 J	60300 J	3630 J	N	37800 J	3990 J	4450 J	2840 J	N	2850 J	8000 J
Chromium	100.0%	35.4	26.6	38	23.7	30.2	25.6	32.3	N	29.1	23.1	23.4	23.3	N	26.5	29.9 J
Cobalt	100.0%	26.6	30	0	26.6	10.3 J	16.1	17.4	N	23.4	12.9	11.5	14.1	N	12.4	14.1
Copper	100.0%	1680	25	72	30.9	29.6 J	23 J	24.8	N	26.5	345	233	79.9	N	89.8	863
Iron	100.0%	39700	32698.0	23	30000	30800 J	31600 J	36900 J	N	35400 J	30700 J	25600 J	26900 J	N	29900 J	35600
Lead	94.5%	6230	30	48	14.4	35.2	18	14.1	N	13.5	6230 J	672 J	171 J	N	185 J	2440
Magnesium	100.0%	16000	9071.1	10	9370	6870	8660	5730	N	7830	4420	5230	4700	N	5540	6140 J
Manganese	100.0%	1650	1065.8	6	1550	561	545	841	N	674	562	565	359	N	423	745
Mercury	71.4%	1.1	0.1	18	0.04 U	0.05 J	0.04 U	0.05 U	N	0.04 U	0.06 J	0.08	0.05 J	N	0.05 J	0.15
Nickel	100.0%	76	41.3	38	58.7	34.8	46.1	46.6	N	55.3	30.1	36.1	26.6	N	33.9	62.1
Potassium	100.0%	3170	1529.6	35	1880	3140	1470	2480	N	1410	1000	1200	1580	N	1750	1980
Selenium	40.7%	1.5	2	0	0.11 U J	0.16 U J	0.11 U J	0.2 U J	N	0.11 U J	0.19 J	0.13 J	0.22 J	N	0.16 J	0.33 J
Silver	7.7%	3.7	0.6	3	1.9 U	2 U	0.88 U	1.8 U	N	0.88 U	0.95 U	1 U	0.97 U	N	0.98 U	1.4 U
Sodium	72.5%	227	76	36	133 J	101 J	110 J	62.6 U	N	62.1 J	34 U	37.1 U	48.2 J	N	43.1 J	48.2 U
Thallium	9.9%	0.8	0.3	9	0.34 U	0.5 U	0.34 U	0.64 U	N	0.36 U	0.37 U	0.37 U	0.38 U	N	0.34 U	0.65 J
Vanadium	100.0%	38.6	150	0	21.6	38.6	20.3	36.3	N	21.4	19.7	22.6	29.5	N	27.4	28.2
Zinc	100.0%	1200	89.1	58	120	79.2 J	65.6 J	96.1 J	N	102 J	284 J	232 J	112 J	N	138 J	900 J
Cyanide	1.1%	2.6	NA	NA	0.63 U	0.73 U	0.63 U	0.7 U	N	0.53 U	0.67 U	0.66 U	0.53 U	N	0.67 U	0.95 U

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GB-13 0-6" 01/23/92 GB-13-1RE	GB-13 0-2' 01/23/92 GB-13-2	GB-14 0-6" 12/16/91 GB-14-1	GB-14 0-6" 12/16/91 GB-14-1A	GB-14 0-6" 12/17/91 GB-14-1ARE	GB-14 0-2' 12/16/91 GB-14-2	GB-14 0-2' 12/16/91 GB-14-2A	GB-15 0-6" 01/23/92 GB-15-1	GB-15 0-2' 01/23/92 GB-15-2	GB-16 0-6" 01/23/92 GB-16-1	GB-16 0-2' 01/23/92 GB-16-2	GB-17/MW21 0-6" 01/14/92 GB-17-1
VOCs (ug/kg)																
Methylene Chloride	2.1%	4	100	0	N	7 U	6 U	6 U	N	6 U	6 U	7 U	6 U	7 U	10 U	6 U
Acetone	0.0%	0	200	0	N	12 U	14 U	12 U	N	12 U	12 U	14 U	12 U	12 U	12 U	12 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	N	6 U	6 U	6 U	N	6 U	6 U	7 U	6 U	6 U	6 U	6 U
Chloroform	5.3%	13	300	0	N	6 U	6 U	6 U	N	6 U	6 U	2 J	6 U	6 U	6 U	6 U
2-Butanone	0.0%	0	300	0	N	12 U	11 U	12 U	N	12 U	12 U	14 U	12 U	12 U	12 U	12 U
1,1,1-Trichloroethane	0.0%	0	800	0	N	6 U	6 U	6 U	N	6 U	6 U	7 U	6 U	6 U	6 U	6 U
Carbon Tetrachloride	0.0%	0	600	0	N	6 U	6 U	6 U	N	6 U	6 U	7 U	6 U	6 U	6 U	6 U
Trichloroethene	3.2%	100	700	0	N	6 U	6 U	6 U	N	6 U	6 U	7 U	6 U	6 U	6 U	6 U
Benzene	0.0%	0	60	0	N	6 U	6 U	6 U	N	6 U	6 U	7 U	6 U	6 U	6 U	6 U
Tetrachloroethene	5.3%	15	1400	0	N	6 U	6 U	6 U	N	6 U	6 U	7 U	6 U	6 U	6 U	6 U
Toluene	3.2%	3	1500	0	N	6 U	6 U	6 U	N	6 U	6 U	7 U	6 U	6 U	6 U	6 U
Chlorobenzene	0.0%	0	1700	0	N	6 U	6 U	6 U	N	6 U	6 U	7 U	6 U	6 U	6 U	6 U
Xylene (total)	0.0%	0	1200	0	N	6 U	6 U	6 U	N	6 U	6 U	7 U	6 U	6 U	6 U	6 U
Semivolatiles (ug/kg)																
Phenol	0.0%	0	30 or MDL	0	N	810 U	740 U	730 U	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
2-Methylphenol	0.0%	0	100 or MDL	0	N	810 U	740 U	730 U	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
4-Methylphenol	0.0%	0	900	0	N	810 U	740 U	730 U	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	N	810 U	740 U	730 U	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Benzoic acid	0.0%	0	2700	0	N	3900 U	3600 U	3500 U J	3500 U R	3800 U	3700 U	4300 U	3700 U	4200 U	3800 U	3900 U
Naphthalene	0.0%	0	13,000	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
2-Methylnaphthalene	0.0%	0	36,400	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
2-Chloronaphthalene	0.0%	0	50,000*	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
2-Nitroaniline	0.0%	0	430 or MDL	0	N	3900 U	3600 U	3500 U J	3500 U R	3800 U	3700 U	4300 U	3700 U	4200 U	3800 U	3900 U
Acenaphthylene	0.0%	0	41,000	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
2,6-Dinitrotoluene	6.1%	340	1000	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
3-Nitroaniline	0.0%	0	500 or MDL	0	N	3900 U	3600 U	3500 U J	3500 U R	3800 U	3700 U	4300 U	3700 U	4200 U	3800 U	3900 U
Acenaphthene	0.0%	0	50,000*	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Dibenzofuran	0.0%	0	6200	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
2,4-Dinitrotoluene	13.1%	4200	50,000*	0	N	810 U	150 J	730 U J	260 R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Diethylphthalate	11.1%	94	7100	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Fluorene	0.0%	0	50,000*	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
N-Nitrosodiphenylamine	10.1%	1000	50,000*	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Hexachlorobenzene	3.0%	90	410	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Pentachlorophenol	1.0%	140	1000 or MDL	0	N	3900 U	3600 U	3500 U	3500 U R	3800 U	3700 U	4300 U	3700 U	4200 U	3800 U	3900 U
Phenanthrene	1.0%	290	50,000*	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Anthracene	1.0%	18	50,000*	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Carbazole	0.0%	0	50,000*	0	N	N	N	N	N	N	N	N	N	N	N	N
Di-n-butylphthalate	32.3%	1500	8100	0	N	110 J	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Fluoranthene	3.0%	480	50,000*	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Pyrene	3.0%	300	50,000*	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Butylbenzylphthalate	1.0%	64	50,000*	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Benzo(a)anthracene	1.0%	200	220 or MDL	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Chrysene	1.0%	250	400	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
bis(2-Ethylhexyl)phthalate	37.4%	1400	50,000*	0	N	290 J	740 U	730 U J	730 U R	770 U	760 U	620 J	970	430 J	860	810 U
Di-n-octylphthalate	1.0%	19	50,000*	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Benzo(b)fluoranthene	1.0%	180	1100	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
benzo(k)fluoranthene	1.0%	190	1100	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Benzo(a)pyrene	1.0%	150	61 or MDL	1	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	N	810 U	740 U	730 U J	730 U R	770 U	760 U	880 U	770 U	870 U	790 U	810 U

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GB-13 0-6" 01/23/92 GB-13-1RE	GB-13 0-2' 01/23/92 GB-13-2	GB-14 0-6" 12/16/91 GB-14-1	GB-14 0-6" 12/16/91 GB-14-1A	GB-14 0-6" 12/17/91 GB-14-1ARE	GB-14 0-2' 12/16/91 GB-14-2	GB-14 0-2' 12/16/91 GB-14-2A	GB-15 0-6" 01/23/92 GB-15-1	GB-15 0-2' 01/23/92 GB-15-2	GB-16 0-6" 01/23/92 GB-16-1	GB-16 0-2' 01/23/92 GB-16-2	GB-17/MW21 0-6" 01/14/92 GB-17-1
Pesticides/PCBs (ug/kg)																
beta-BHC	0.0%	0	200	0	25 U J	20 U	18 U	18 U	N	19 U	18 U	21 U	19 U	21 U	19 U	20 U
delta-BHC	0.0%	0	300	0	25 U J	20 U	18 U	18 U	N	19 U	18 U	21 U	19 U	21 U	19 U	20 U
gamma-BHC (Lindane)	0.0%	0	60	0	25 U J	20 U	18 U	18 U	N	19 U	18 U	21 U	19 U	21 U	19 U	20 U
Heptachlor	0.0%	0	100	0	25 U J	20 U	18 U	18 U	N	19 U	18 U	21 U	19 U	21 U	19 U	20 U
Aldrin	1.1%	2.5	41	0	25 U J	20 U	18 U	18 U	N	19 U	18 U	21 U	19 U	21 U	19 U	20 U
Heptachlor epoxide	0.0%	0	20	0	25 U J	20 U	18 U	18 U	N	19 U	18 U	21 U	19 U	21 U	19 U	20 U
Endosulfan I	1.1%	1.3	900	0	25 U J	20 U	18 U	18 U	N	19 U	18 U	21 U	19 U	21 U	19 U	20 U
Dieldrin	0.0%	0	44	0	51 U J	39 U	36 U	35 U	N	38 U	37 U	43 U	37 U	42 U	38 U	39 U
4,4'-DDE	5.4%	32	2100	0	51 U J	39 U	36 U	35 U	N	38 U	37 U	43 U	37 U	42 U	38 U	39 U
Endrin	0.0%	0	100	0	51 U J	39 U	36 U	35 U	N	38 U	37 U	43 U	37 U	42 U	38 U	39 U
Endosulfan II	0.0%	0	900	0	51 U J	39 U	36 U	35 U	N	38 U	37 U	43 U	37 U	42 U	38 U	39 U
4,4'-DDD	1.1%	4.2	2900	0	51 U J	39 U	36 U	35 U	N	38 U	37 U	43 U	37 U	42 U	38 U	39 U
Endosulfan sulfate	0.0%	0	1000	0	51 U J	39 U	36 U	35 U	N	38 U	37 U	43 U	37 U	42 U	38 U	39 U
4,4'-DDT	2.2%	5.3	2100	0	51 U J	39 U	36 U	35 U	N	38 U	37 U	43 U	37 U	42 U	38 U	39 U
Endrin aldehyde	0.0%	0		NA	N	N	N	N	N	N	N	N	N	N	N	N
alpha-Chlordane	0.0%	0	540	0	250 U J	200 U	180 U	180 U	N	190 U	180 U	210 U	190 U	210 U	190 U	200 U
Aroclor-1254	1.1%	430	1000	0	510 U J	390 U	360 U	350 U	N	380 U	370 U	430 U	370 U	420 U	380 U	390 U
Aroclor-1260	1.1%	240	1000	0	510 U J	390 U	360 U	350 U	N	380 U	370 U	430 U	370 U	420 U	380 U	390 U
Explosives (ug/kg)																
HMX	1.1%	75		NA	N	1000 U	1000 U	1000 U	N	1000 U	1000 U	1000 U J	1000 U	1000 U J	1000 U	1000 U
RDX	4.4%	240		NA	N	120 U	120 U	120 U	N	120 U	120 U	90 J	120 U	120 U J	120 U	120 U
1,3,5-Trinitrobenzene	7.8%	280		NA	N	120 U	120 U	120 U	N	120 U	120 U	120 U J	120 U	120 U J	120 U	120 U
1,3-Dinitrobenzene	0.0%	0		NA	N	120 U	120 U	120 U	N	120 U	120 U	120 U J	120 U	120 U J	120 U	120 U
Tetryl	0.0%	0		NA	N	400 U	400 U	400 U	N	400 U	400 U	400 U J	400 U	400 U J	400 U	400 U
2,4,6-Trinitrotoluene	5.6%	350		NA	N	120 U	120 U	120 U	N	120 U	120 U	120 U J	120 U	120 U J	120 U	120 U
4-amino-2,6-Dinitrotoluene	10.0%	430		NA	N	120 U	120 U	120 U	N	120 U	120 U	99 J	120 U	120 U J	120 U	120 U
2-amino-4,6-Dinitrotoluene	13.3%	370		NA	N	120 U	120 U	120 U	N	120 U	120 U	130 J	120 U	120 U J	120 U	120 U
2,6-Dinitrotoluene	1.1%	67	1000	0	N	120 U	120 U	120 U	N	120 U	120 U	120 U J	120 U	120 U J	120 U	120 U
2,4-Dinitrotoluene	13.3%	2400		NA	N	120 U	120 U	120 U	N	120 U	120 U	120 U J	120 U	120 U J	120 U	120 U
Metals (mg/kg)																
Aluminum	100.0%	25300	17503.0	33	N	18600 J	13000	10800	N	21000	17600	18900 J	16600 J	18500 J	13600 J	19000
Antimony	13.2%	26.6	5	12	N	6.8 U J	6 U R	5.9 U R	N	5.7 U R	6 U R	7 U J	9.2 J	6.8 U J	6.2 U J	6.4 U J
Arsenic	98.9%	18.5	7.5	8	N	5.8	3.9 J	3.9 J	N	4.3 J	5.1 J	5.9	3	4.4	4.1	5.3
Barium	91.2%	4520	300	15	N	325 R	78.5 J	51.5 J	N	148 J	92.7 J	384 R	255 R	929 R	127 R	551 R
Beryllium	61.5%	1.1	1	1	N	0.93	0.78 R	0.68 R	N	0.97 R	0.73 R	0.97	0.84	0.91	0.72	1.6 R
Cadmium	56.0%	7	1.8	44	N	3.8	2.5	2.2	N	3.4	3	2.4	2	2.7	1.8	3.9 J
Calcium	100.0%	99000	46825.0	14	N	6130 J	12300 J	12100 J	N	5790 J	8130 J	3820 J	18600 J	10200 J	43600 J	4040
Chromium	100.0%	35.4	26.6	38	N	27.9 J	23.5	19.8	N	27.6	25.9	24.6 J	22.3 J	25.5 J	17.1 J	25.9 J
Cobalt	100.0%	26.6	30	0	N	14.7	13.3	10.9	N	12.9	13.9	12.4	9	9.7	9.1	18.9
Copper	100.0%	1680	25	72	N	234	65.3	49.8	N	57.8	42	345	81.6 J	51.6 J	21.4 J	39.1
Iron	100.0%	39700	32698.0	23	N	32600	25200 J	22000 J	N	29900 J	28000 J	28300	26800	27200	20800	31700
Lead	94.5%	6230	30	48	N	1060	49.8	68.5	N	137	77.5	2340	985	30.5 R	10.8 R	98.4
Magnesium	100.0%	16000	9071.1	10	N	6210 J	5990	5270	N	5510	5620	5470 J	5890 J	6190 J	9610 J	6490
Manganese	100.0%	1650	1065.8	6	N	620	349	317	N	419	490	624	476	510	448	620
Mercury	71.4%	1.1	0.1	18	N	0.11	0.06 J	0.08 J	N	0.07 J	0.06 J	0.1 J	0.04 J	0.35	0.02 U	0.17 R
Nickel	100.0%	76	41.3	38	N	40.7	43.4	37.5	N	40.2	37.9	33.8	34.8	31.1	24.7	39.2
Potassium	100.0%	3170	1529.6	35	N	1710	1110	872	N	2130	1620	1900	1820	1670	1500	1430 J
Selenium	40.7%	1.5	2	0	N	0.28 J	0.46 J	0.39 J	N	0.14 J	0.19 J	0.33 J	0.15 J	1.2 U J	0.86 U J	0.19 U J
Silver	7.7%	3.7	0.6	3	N	1.1 U	0.98 U	0.96 U	N	0.92 U	0.97 U	1.1 U	0.98 U	1.1 U	1 U	0.41 U
Sodium	72.5%	227	76	36	N	39.4 U	34.8 U	34.3 U	N	43.1 J	52.4 J	40.7 U	34.9 U	39.4 U	36 U	86.2 J
Thallium	9.9%	0.8	0.3	9	N	0.5 J	0.37	0.39	N	0.33 U	0.32 U	0.53 U	0.31 J	0.67 J	0.41 U	0.46 U
Vanadium	100.0%	38.6	150	0	N	27.7	21.8	16.2	N	30.7	24.3	28.7	23.6	28.9	22.2	26.2 J
Zinc	100.0%	1200	89.1	58	N	491 J	251 J	173 J	N	113 J	102 J	150 J	123 J	308 J	72.1 J	149
Cyanide	1.1%	2.6	NA	NA	N	0.73 U	0.66 U	0.66 U	N	0.55 U	0.64 U	0.7 U	0.56 U	0.72 U	0.54 U	0.57 U

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GB-17/MW21 0-2' 11/01/91 S110105	GB-18/MW19 0-6" 01/14/92 GB-18-1	GB-18/MW19 5-5.5' 10/31/91 S103104	GB-19 0-6" 01/14/92 GB-19-1	GB-20/MW29 0-6" 01/14/92 GB-20-1	GB20/MW29 2-4' 11/13/91 S1311106	GB21/MW30 0-2' 11/14/91 S1411110MW30	MW-31 0-2' 11/15/92 S1511115MW31	MW-32 0-2' 11/19/91 S1911118MW32	MW-34 0-2' 11/20/91 S2011121MW34	MW-34 0-2' 11/20/91 S2011121MW34RE
VOCs (ug/kg)															
Methylene Chloride	2.1%	4	100	0	6 U	7 U	5 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N
Acetone	0.0%	0	200	0	11 U	13 U	11 U J	13 U	13 U	11 U	18 U	17 U	12 U	12 U	N
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	6 U	7 U	5 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N
Chloroform	5.3%	13	300	0	6 U	7 U	5 U J	6 U	5 J	6 U	6 U	6 U	6 U	6 U	N
2-Butanone	0.0%	0	300	0	11 U	13 U	11 U J	13 U	13 U	11 U	12 U	12 U	12 U	12 U	N
1,1,1-Trichloroethane	0.0%	0	800	0	6 U	7 U	5 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N
Carbon Tetrachloride	0.0%	0	600	0	6 U	7 U	5 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N
Trichloroethene	3.2%	100	700	0	6 U	7 U	5 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N
Benzene	0.0%	0	60	0	6 U	7 U	5 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N
Tetrachloroethene	5.3%	15	1400	0	6 U	7 U	5 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N
Toluene	3.2%	3	1500	0	2 J	7 U	2 J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N
Chlorobenzene	0.0%	0	1700	0	6 U	7 U	5 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N
Xylene (total)	0.0%	0	1200	0	6 U	7 U	5 U J	6 U	6 U	6 U	6 U	6 U	6 U	6 U	N
Semivolatiles (ug/kg)															
Phenol	0.0%	0	30 or MDL	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
2-Methylphenol	0.0%	0	100 or MDL	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
4-Methylphenol	0.0%	0	900	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
2,4-Dimethylphenol	0.0%	0	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Benzoic acid	0.0%	0	2700	0	3600 U	4700 U	3400 U	4400 U	4400 U	3600 U	3900 U	N	N	3500 U	N
Naphthalene	0.0%	0	13,000	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
2-Methylnaphthalene	0.0%	0	36,400	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
2-Chloronaphthalene	0.0%	0	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
2-Nitroaniline	0.0%	0	430 or MDL	0	3600 U	4700 U	3400 U	4400 U	4400 U	3600 U	3900 U	N	N	3500 U	N
Acenaphthylene	0.0%	0	41,000	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
2,6-Dinitrotoluene	6.1%	340	1000	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
3-Nitroaniline	0.0%	0	500 or MDL	0	3600 U	4700 U	3400 U	4400 U	4400 U	3600 U	3900 U	N	N	3500 U	N
Acenaphthene	0.0%	0	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Dibenzofuran	0.0%	0	6200	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
2,4-Dinitrotoluene	13.1%	4200	50,000*	0	730 U	960 U	710 U	280 J	900 U	750 U	790 U	N	N	730 U	N
Diethylphthalate	11.1%	94	7100	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Fluorene	0.0%	0	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
N-Nitrosodiphenylamine	10.1%	1000	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Hexachlorobenzene	3.0%	90	410	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Pentachlorophenol	1.0%	140	1000 or MDL	0	3600 U	4700 U	3400 U	4400 U	4400 U	3600 U	3900 U	N	N	3500 U	N
Phenanthrene	1.0%	290	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Anthracene	1.0%	18	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Carbazole	0.0%	0	50,000*	0	N	N	N	N	N	N	N	N	N	N	N
Di-n-butylphthalate	32.3%	1500	8100	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Fluoranthene	3.0%	480	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	78 J	N	N	730 U	N
Pyrene	3.0%	300	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	120 J	N	N	730 U	N
Butylbenzylphthalate	1.0%	64	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Benzo(a)anthracene	1.0%	200	220 or MDL	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Chrysene	1.0%	250	400	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
bis(2-Ethylhexyl)phthalate	37.4%	1400	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Di-n-octylphthalate	1.0%	19	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Benzo(b)fluoranthene	1.0%	180	1100	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
benzo(k)fluoranthene	1.0%	190	1100	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Benzo(a)pyrene	1.0%	150	61 or MDL	1	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	730 U	960 U	710 U	900 U	900 U	750 U	790 U	N	N	730 U	N

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	GB-17/MW21 0-2' 11/01/91 S110105	GB-18/MW19 0-6" 01/14/92 GB-18-1	GB-18/MW19 5-5.5' 10/31/91 S103104	GB-19 0-6" 01/14/92 GB-19-1	GB-20/MW29 0-6" 01/14/92 GB-20-1	GB20/MW29 2-4' 11/13/91 S1311106	GB21/MW30 0-2' 11/14/91 S1411110MW30	MW-31 0-2' 11/15/92 S1511115MW31	MW-32 0-2' 11/19/91 S1911118MW32	MW-34 0-2' 11/20/91 S2011121MW34	MW-34 0-2' 11/20/91 S2011121MW34RE
Pesticides/PCBs (ug/kg)															
beta-BHC	0.0%	0	200	0	18 U	23 U	17 U	22 U	22 U	18 U	19 U	N	N	18 U	18 U R
delta-BHC	0.0%	0	300	0	18 U	23 U	17 U	22 U	22 U	18 U	19 U	N	N	18 U	18 U R
gamma-BHC (Lindane)	0.0%	0	60	0	18 U	23 U	17 U	22 U	22 U	18 U	19 U	N	N	18 U	18 U R
Heptachlor	0.0%	0	100	0	18 U	23 U	17 U	22 U	22 U	18 U	19 U	N	N	18 U	18 U R
Aldrin	1.1%	2.5	41	0	18 U	23 U	17 U	22 U	22 U	18 U	19 U	N	N	18 U	18 U R
Heptachlor epoxide	0.0%	0	20	0	18 U	23 U	17 U	22 U	22 U	18 U	19 U	N	N	18 U	18 U R
Endosulfan I	1.1%	1.3	900	0	18 U	23 U	17 U	22 U	22 U	18 U	19 U	N	N	18 U	18 U R
Dieldrin	0.0%	0	44	0	36 U	47 U	34 U	44 U	44 U	36 U	39 U	N	N	35 U	36 U R
4,4'-DDE	5.4%	32	2100	0	36 U	47 U	34 U	44 U	44 U	36 U	20 J	N	N	35 U	36 U R
Endrin	0.0%	0	100	0	36 U	47 U	34 U	44 U	44 U	36 U	39 U	N	N	35 U	36 U R
Endosulfan II	0.0%	0	900	0	36 U	47 U	34 U	44 U	44 U	36 U	39 U	N	N	35 U	36 U R
4,4'-DDD	1.1%	4.2	2900	0	36 U	47 U	34 U	44 U	44 U	36 U	39 U	N	N	35 U	36 U R
Endosulfan sulfate	0.0%	0	1000	0	36 U	47 U	34 U	44 U	44 U	36 U	39 U	N	N	35 U	36 U R
4,4'-DDT	2.2%	5.3	2100	0	36 U	47 U	34 U	44 U	44 U	36 U	39 U	N	N	35 U	36 U R
Endrin aldehyde	0.0%	0		NA	N	N	N	N	N	N	N	N	N	N	N
alpha-Chlordane	0.0%	0	540	0	180 U	230 U	170 U	220 U	220 U	180 U	190 U	N	N	180 U	180 U R
Aroclor-1254	1.1%	430	1000	0	360 U	470 U	340 U	440 U	440 U	360 U	390 U	N	N	350 U	360 U R
Aroclor-1260	1.1%	240	1000	0	360 U	470 U	340 U	440 U	440 U	360 U	390 U	N	N	350 U	360 U R
Explosives (ug/kg)															
HMX	1.1%	75		NA	120 U	1000 U	120 U	1000 U	1000 U	120 U	120 U	N	N	120 U	N
RDX	4.4%	240		NA	120 U	120 U	120 U	120 U	120 U	120 U	240	N	N	120 U	N
1,3,5-Trinitrobenzene	7.8%	280		NA	120 U	120 U	120 U	120 U	66 J	120 U	120 U	N	N	120 U	N
1,3-Dinitrobenzene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	N	N	120 U	N
Tetryl	0.0%	0		NA	120 U	400 U	120 U	400 U	400 U	120 U	120 U	N	N	120 U	N
2,4,6-Trinitrotoluene	5.6%	350		NA	120 U	120 U	120 U	120 U	350	120 U	120 U	N	N	120 U	N
4-amino-2,6-Dinitrotoluene	10.0%	430		NA	120 U	120 U	120 U	120 U	120 U	120 U	130	N	N	120 U	N
2-amino-4,6-Dinitrotoluene	13.3%	370		NA	120 U	120 U	120 U	120 U	120 U	120 U	110 J	N	N	120 U	N
2,6-Dinitrotoluene	1.1%	67	1000	0	120 U	120 U	120 U	120 U	120 U	120 U	120 U	N	N	120 U	N
2,4-Dinitrotoluene	13.3%	2400		NA	120 U	120 U	120 U	160	120 U	120 U	120 U	N	N	120 U	N
Metals (mg/kg)															
Aluminum	100.0%	25300	17503.0	33	18300	19100	17500	19200	21200	16900	16000	N	N	16100	N
Antimony	13.2%	26.6	5	12	9.7 U J	7.3 U J	8.1 U J	8.2 J	7 U J	11.4 U J	6.4 U J	N	N	5.7 J	N
Arsenic	98.9%	18.5	7.5	8	6.2	5	9.1	12.5	5.1	8.5	4	N	N	6.3 U	N
Barium	91.2%	4520	300	15	77.1	1740	96.9	1190	211 R	95.2	253	N	N	67.5	N
Beryllium	61.5%	1.1	1	1	0.84 J	1.1 R	0.88	1.1 R	1.2 R	1.1	0.94	N	N	0.86	N
Cadmium	56.0%	7	1.8	44	2.3	5.2 J	2.5	3.9 J	3.9 J	2.5	2.7	N	N	2.3	N
Calcium	100.0%	99000	46825.0	14	7540	8680	59100	6020	9770	86100	9150	N	N	28600	N
Chromium	100.0%	35.4	26.6	38	30	25.6 J	28.5	27 J	29.3 J	25.1	23.1	N	N	26.6	N
Cobalt	100.0%	26.6	30	0	17.2	13.1	15.8	11.2	14.2	10.9	11.5	N	N	17	N
Copper	100.0%	1680	25	72	28.1	82.4	27	619	50	28.7	74.7	N	N	32.7	N
Iron	100.0%	39700	32698.0	23	39700	29800	34900	28800	31600	26600	27900	N	N	35000	N
Lead	94.5%	6230	30	48	18.5	173	22.3	2370	82.6	16.1	316	N	N	11.9	N
Magnesium	100.0%	16000	9071.1	10	7930	5710	9870	6170	7010	8590	4790	N	N	6850	N
Manganese	100.0%	1650	1065.8	6	617	1100	546	796	695	498	620	N	N	803	N
Mercury	71.4%	1.1	0.1	18	0.06 R	1.1	0.04 U	0.19 R	0.13 R	0.04 U	0.16 R	N	N	0.07 R	N
Nickel	100.0%	76	41.3	38	50.7 J	26.8	52.9 J	31.3	40.4	59 J	30.9 J	N	N	49.3 J	N
Potassium	100.0%	3170	1529.6	35	1490	1950 J	2650	2460 J	2660 J	3170	2040	N	N	1290	N
Selenium	40.7%	1.5	2	0	0.13 U J	0.32 J	0.19 U J	0.64 J	0.36 J	0.16 U J	0.23 U J	N	N	0.18 U J	N
Silver	7.7%	3.7	0.6	3	1.4 U	0.46 U	1.2 U	0.44 U	0.45 U	1.7 U	0.96 U	N	N	0.87 J	N
Sodium	72.5%	227	76	36	74 U	59 J	147 J	66.5 J	64 J	196 J	52.8 J	N	N	55.2 J	N
Thallium	9.9%	0.8	0.3	9	0.35 U	0.69 U	0.53 U	0.8 J	0.57 J	0.46 U	0.64 U	N	N	0.51 U	N
Vanadium	100.0%	38.6	150	0	25.7	30.1 J	26.8	29.6 J	30.2 J	27.4	25.7	N	N	22.3	N
Zinc	100.0%	1200	89.1	58	71.2	621	100	399	175	86.3	220	N	N	95.7	N
Cyanide	1.1%	2.6	NA	NA	0.66 U	0.84 U	0.6 U	0.75 U	0.8 U	0.68 U	0.7 U	N	N	0.54 U	N

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 0-2 01/18/93 GB23-1	OB 2-4 01/18/93 GB23-2	OB 0-2 01/18/93 GB23-6	OB 0-2 01/18/93 GB24-1	OB 2-4 01/18/93 GB24-2	OB 0-2 01/18/93 GB25-1	OB 2-4 01/18/93 GB25-2	OB 0-2 01/19/93 GB26-1	OB 2-4 01/19/93 GB26-2	OB 0-2 01/19/93 GB26-4	OB 0-2 01/19/93 GB27-1	OB 4-6 01/19/93 GB27-3
VOCs (ug/kg)																
Methylene Chloride	2.1%	4	100	0	12 U	12 U	13 U	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
Acetone	0.0%	0	200	0	12 U	12 U	13 U	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	12 U	12 U	13 U	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
Chloroform	5.3%	13	300	0	12 U	12 U	13 U	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
2-Butanone	0.0%	0	300	0	12 U	12 U	13 U	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
1,1,1-Trichloroethane	0.0%	0	800	0	12 U	12 U	13 U	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
Carbon Tetrachloride	0.0%	0	600	0	12 U	12 U	13 U	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
Trichloroethene	3.2%	100	700	0	12 U	12 U	13 U	12 U	12 U	100	78	13 U	12 U	12 U	12 U	12 U
Benzene	0.0%	0	60	0	12 U	12 U	13 U	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
Tetrachloroethene	5.3%	15	1400	0	2 J	12 U	15 J	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
Toluene	3.2%	3	1500	0	12 U	12 U	13 U	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
Chlorobenzene	0.0%	0	1700	0	12 U	12 U	13 U	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
Xylene (total)	0.0%	0	1200	0	12 U	12 U	13 U	12 U	12 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U
Semivolatiles (ug/kg)																
Phenol	0.0%	0	30 or MDL	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
2-Methylphenol	0.0%	0	100 or MDL	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
4-Methylphenol	0.0%	0	900	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Benzoic acid	0.0%	0	2700	0	N	N	N	N	N	N	N	N	N	N	N	N
Naphthalene	0.0%	0	13,000	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
2-Methylnaphthalene	0.0%	0	36,400	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
2-Chloronaphthalene	0.0%	0	50,000*	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
2-Nitroaniline	0.0%	0	430 or MDL	0	1000 U	990 U	1000 U	950 U	880 U	970 U	890 U	980 U	980 U	990 U	950 U	940 U
Acenaphthylene	0.0%	0	41,000	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
2,6-Dinitrotoluene	6.1%	340	1000	0	41 J	410 U	290 J	210 J	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
3-Nitroaniline	0.0%	0	500 or MDL	0	1000 U	990 U	1000 U	950 U	880 U	970 U	890 U	980 U	980 U	990 U	950 U	940 U
Acenaphthene	0.0%	0	50,000*	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Dibenzofuran	0.0%	0	6200	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
2,4-Dinitrotoluene	13.1%	4200	50,000*	0	330 J	410 U	3400	2300	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Diethylphthalate	11.1%	94	7100	0	420 U	410 U	67 J	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Fluorene	0.0%	0	50,000*	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
N-Nitrosodiphenylamine	10.1%	1000	50,000*	0	190 J	410 U	380 J	260 J	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Hexachlorobenzene	3.0%	90	410	0	22 J	410 U	20 J	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Pentachlorophenol	1.0%	140	1000 or MDL	0	1000 U	990 U	1000 U	950 U	880 U	970 U	890 U	980 U	140 J	990 U	950 U	940 U
Phenanthrene	1.0%	290	50,000*	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Anthracene	1.0%	18	50,000*	0	420 U	410 U	420 U	18 J	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Carbazole	0.0%	0	50,000*	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Di-n-butylphthalate	32.3%	1500	8100	0	1000	66 J	1500	380 J	34 J	260 J	76 J	400 U	400 U	410 U	390 U	390 U
Fluoranthene	3.0%	480	50,000*	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Pyrene	3.0%	300	50,000*	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Butylbenzylphthalate	1.0%	64	50,000*	0	420 U	64 J	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Benzo(a)anthracene	1.0%	200	220 or MDL	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Chrysene	1.0%	250	400	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
bis(2-Ethylhexyl)phthalate	37.4%	1400	50,000*	0	400 J	360 J	460	290 J	120 J	420	190 J	870	400 U	1400	870	700
Di-n-octylphthalate	1.0%	19	50,000*	0	420 U	19 J	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Benzo(b)fluoranthene	1.0%	180	1100	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
benzo(k)fluoranthene	1.0%	190	1100	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Benzo(a)pyrene	1.0%	150	61 or MDL	1	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	420 U	410 U	420 U	390 U	360 U	400 U	370 U	400 U	400 U	410 U	390 U	390 U

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 0-2 01/18/93 GB23-1	OB 2-4 01/18/93 GB23-2	OB 0-2 01/18/93 GB23-6	OB 0-2 01/18/93 GB24-1	OB 2-4 01/18/93 GB24-2	OB 0-2 01/18/93 GB25-1	OB 2-4 01/18/93 GB25-2	OB 0-2 01/19/93 GB26-1	OB 2-4 01/19/93 GB26-2	OB 0-2 01/19/93 GB26-4	OB 0-2 01/19/93 GB27-1	OB 4-6 01/19/93 GB27-3
Pesticides/PCBs (ug/kg)																
beta-BHC	0.0%	0	200	0	2.2 U	2.1 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2.1 U	2.1 U	2.1 U	2 U	2 U
delta-BHC	0.0%	0	300	0	2.2 U	2.1 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2.1 U	2.1 U	2.1 U	2 U	2 U
gamma-BHC (Lindane)	0.0%	0	60	0	2.2 U	2.1 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2.1 U	2.1 U	2.1 U	2 U	2 U
Heptachlor	0.0%	0	100	0	2.2 U	2.1 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2.1 U	2.1 U	2.1 U	2 U	2 U
Aldrin	1.1%	2.5	41	0	2.2 U	2.1 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2.1 U	2.1 U	2.1 U	2 U	2 U
Heptachlor epoxide	0.0%	0	20	0	2.2 U	2.1 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2.1 U	2.1 U	2.1 U	2 U	2 U
Endosulfan I	1.1%	1.3	900	0	2.2 U	2.1 U	1.3 J	2 U	1.8 U	2 U	1.9 U	2.1 U	2.1 U	2.1 U	2 U	2 U
Dieldrin	0.0%	0	44	0	4.2 U	4 U	4.2 U	3.9 U	3.6 U	4 U	3.6 U	4 U	4.1 U	4.1 U	3.9 U	3.9 U
4,4'-DDE	5.4%	32	2100	0	4.2 U	4 U	4.2 U	5.8	3.6 U	4 U	3.6 U	4 U	4.1 U	4.1 U	3.9 U	3.9 U
Endrin	0.0%	0	100	0	4.2 U	4 U	4.2 U	3.9 U	3.6 U	4 U	3.6 U	4 U	4.1 U	4.1 U	3.9 U	3.9 U
Endosulfan II	0.0%	0	900	0	4.2 U	4 U	4.2 U	3.9 U	3.6 U	4 U	3.6 U	4 U	4.1 U	4.1 U	3.9 U	3.9 U
4,4'-DDD	1.1%	4.2	2900	0	4.2 U	4 U	4.2 U	4.2	3.6 U	4 U	3.6 U	4 U	4.1 U	4.1 U	3.9 U	3.9 U
Endosulfan sulfate	0.0%	0	1000	0	4.2 U	4 U	4.2 U	3.9 U	3.6 U	4 U	3.6 U	4 U	4.1 U	4.1 U	3.9 U	3.9 U
4,4'-DDT	2.2%	5.3	2100	0	4.2 U	4 U	4.2 U	3.9 J	3.6 U	4 U	3.6 U	4 U	4.1 U	4.1 U	3.9 U	3.9 U
Endrin aldehyde	0.0%	0		NA	4.2 U	4 U	4.2 U	3.9 U	3.6 U	4 U	3.6 U	4 U	4.1 U	4.1 U	3.9 U	3.9 U
alpha-Chlordane	0.0%	0	540	0	2.2 U	2.1 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2.1 U	2.1 U	2.1 U	2 U	2 U
Aroclor-1254	1.1%	430	1000	0	42 U	40 U	430 J	39 U	36 U	40 U	36 U	40 U	41 U	41 U	39 U	39 U
Aroclor-1260	1.1%	240	1000	0	42 U	40 U	42 U	39 U	36 U	40 U	36 U	40 U	41 U	41 U	39 U	39 U
Explosives (ug/kg)																
HMX	1.1%	75		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
RDX	4.4%	240		NA	120 U	100 J	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
1,3,5-Trinitrobenzene	7.8%	280		NA	260	120 U	200	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
1,3-Dinitrobenzene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Tetryl	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4,6-Trinitrotoluene	5.6%	350		NA	100 J	120 U	57 J	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	10.0%	430		NA	430	120 U	280 J	64 J	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2-amino-4,6-Dinitrotoluene	13.3%	370		NA	370	120 U	270	140	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,6-Dinitrotoluene	1.1%	67	1000	0	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4-Dinitrotoluene	13.3%	2400		NA	2400 J	120 U	1200 J	260	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Metals (mg/kg)																
Aluminum	100.0%	25300	17503.0	33	20500	17100	17700	19100	7440	15000	14900	16500	11900	17400	14500	13800
Antimony	13.2%	26.6	5	12	26.6 J	6.3 UJ	18.5 J	7.3 J	5.8 UJ	6.5 UJ	5.4 UJ	6.5 UJ	5.9 UJ	6.1 UJ	5.6 UJ	6.2 UJ
Arsenic	98.9%	18.5	7.5	8	7.7 J	4.1 J	5.9 J	4.2 J	1.5 J	4.1 J	2.2 J	6.5	5.2	5.4	5.9	4.6
Barium	91.2%	4520	300	15	4520	175 J	3070	1480	42.5 J	103 J	75.9 J	120	73.3	176	90.9	71.5
Beryllium	61.5%	1.1	1	1	0.74	0.77	0.69	0.9	0.4 J	0.7	0.66	0.91	0.57	0.89	0.71	0.64
Cadmium	56.0%	7	1.8	44	5.5	0.38 J	5.9	1	0.33 U	0.37 U	0.31 U	0.37 U	0.34 U	0.35 U	0.32 U	0.35 U
Calcium	100.0%	99000	46825.0	14	8600	9950	9120	5780	1060	38100	22900	4010	4070	4370	5680	41700
Chromium	100.0%	35.4	26.6	38	35.4	30.7	31.4	34.3	14.1	25.4	27.1	26.4	21.8	28.7	24.5	24.7
Cobalt	100.0%	26.6	30	0	12.9	14.8	10.5	13.1	13.6	10.6	15.8	13.2	11.4	16.5	12.4	11.8
Copper	100.0%	1680	25	72	1680	74.2	869	1400	27.4	39.1	41.7	30.1	40.8	41.2	32.3	33.1
Iron	100.0%	39700	32698.0	23	36100	33000	30400	32700	16100	29100	31400	31900	27600	34400	28200	26400
Lead	94.5%	6230	30	48	5200	163	3200	1310	17.9	57.2	22.1	67.5	21.5	32.7	16.8	17.7
Magnesium	100.0%	16000	9071.1	10	7510	7290	6290	7190	3460	7800	6830	5490	4800	6100	5790	8600
Manganese	100.0%	1650	1065.8	6	365	434	385	655	346	416	362	422 J	498	1270 J	659	421
Mercury	71.4%	1.1	0.1	18	0.41	0.11 J	0.27	0.2	0.03 J	0.04 J	0.04 J	0.06 J	0.03 U	0.06 J	0.06 J	0.03 U
Nickel	100.0%	76	41.3	38	39.5	55.1	39.7	49.1	32.7	45.4	54.7	40.9	41.2	49	45.6	41.3
Potassium	100.0%	3170	1529.6	35	1770	1360	1340	2060	592	1440	1300	1580	948	1740	1320	1640
Selenium	40.7%	1.5	2	0	1.5 J	0.9 J	0.45 J	0.88 J	0.3 J	0.75 J	0.58 J	0.15 UJ	0.16 UJ	0.27 UJ	0.22 UJ	0.16 UJ
Silver	7.7%	3.7	0.6	3	1 R	0.39 R	0.71 R	3.7	0.34 U	0.38 U	0.32 U	0.38 U	0.35 U	0.36 U	0.33 U	0.36 U
Sodium	72.5%	227	76	36	227 J	106 J	158 J	89.5 J	32.2 U	93.5 J	82.6 J	55.2 J	53.6 J	71.7 J	60.2 J	113 J
Thallium	9.9%	0.8	0.3	9	0.48 U	0.61 U	0.45 U	0.53 U	0.57 U	0.54 U	0.51 U	0.34 U	0.38 U	0.65 U	0.52 U	0.38 U
Vanadium	100.0%	38.6	150	0	28.3	24.7	26.5	30.4	10	22.6	20.2	27.5	20.3	29.3	22.9	20.7
Zinc	100.0%	1200	89.1	58	1200	123	992	375	45.4	103	56.7	90.3	87.9	93.4	99.4	93.9
Cyanide	1.1%	2.6	NA	NA	0.77 U	0.73 U	0.78 U	0.7 U	0.63 U	0.73 U	0.62 U	0.75 U	0.77 U	0.81 U	0.7 U	0.71 U

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 0-2 01/14/93 GB28-1	OB 2-4 01/14/93 GB28-2	OB 0-2 01/19/93 GB29-1	OB 2-4 01/19/93 GB29-2	OB 0-2 01/19/93 GB29-4	OB 0-2 01/18/93 GB30-1	OB 4-6 01/18/93 GB30-3	OB 0-2 01/15/93 GB31-1	OB 2-4 01/15/93 GB31-2	OB 0-2 01/15/93 GB32-1	OB 4-5 01/15/93 GB32-3	OB 0-2 01/18/93 GB33-1
VOCs (ug/kg)																
Methylene Chloride	2.1%	4	100	0	4 J	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	2 J	12 U
Acetone	0.0%	0	200	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
Chloroform	5.3%	13	300	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
2-Butanone	0.0%	0	300	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
1,1,1-Trichloroethane	0.0%	0	800	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
Carbon Tetrachloride	0.0%	0	600	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
Trichloroethene	3.2%	100	700	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
Benzene	0.0%	0	60	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
Tetrachloroethene	5.3%	15	1400	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
Toluene	3.2%	3	1500	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
Chlorobenzene	0.0%	0	1700	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
Xylene (total)	0.0%	0	1200	0	11 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U
Semivolatiles (ug/kg)																
Phenol	0.0%	0	30 or MDL	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
2-Methylphenol	0.0%	0	100 or MDL	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
4-Methylphenol	0.0%	0	900	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Benzoic acid	0.0%	0	2700	0	N	N	N	N	N	N	N	N	N	N	N	N
Naphthalene	0.0%	0	13,000	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
2-Methylnaphthalene	0.0%	0	36,400	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
2-Chloronaphthalene	0.0%	0	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
2-Nitroaniline	0.0%	0	430 or MDL	0	920 U	890 U	1000 U	920 U	950 U	950 U	870 U	960 U	990 U	980 U	880 U	930 U
Acenaphthylene	0.0%	0	41,000	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
2,6-Dinitrotoluene	6.1%	340	1000	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
3-Nitroaniline	0.0%	0	500 or MDL	0	920 U	890 U	1000 U	920 U	950 U	950 U	870 U	960 U	990 U	980 U	880 U	930 U
Acenaphthene	0.0%	0	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Dibenzofuran	0.0%	0	6200	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
2,4-Dinitrotoluene	13.1%	4200	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	410	410 U	410 U	360 U	380 U
Diethylphthalate	11.1%	94	7100	0	380 U	370 U	420 U	380 U	30 J	26 J	23 J	400 U	410 U	410 U	360 U	21 J
Fluorene	0.0%	0	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
N-Nitrosodiphenylamine	10.1%	1000	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	100 J	410 U	410 U	360 U	380 U
Hexachlorobenzene	3.0%	90	410	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Pentachlorophenol	1.0%	140	1000 or MDL	0	920 U	890 U	1000 U	920 U	950 U	950 U	870 U	960 U	990 U	980 U	880 U	930 U
Phenanthrene	1.0%	290	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Anthracene	1.0%	18	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Carbazole	0.0%	0	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Di-n-butylphthalate	32.3%	1500	8100	0	380 U	25 J	30 J	61 J	22 J	37 J	60 J	23 J	120 J	410 U	24 J	22 J
Fluoranthene	3.0%	480	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Pyrene	3.0%	300	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Butylbenzylphthalate	1.0%	64	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Benzo(a)anthracene	1.0%	200	220 or MDL	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Chrysene	1.0%	250	400	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
bis(2-Ethylhexyl)phthalate	37.4%	1400	50,000*	0	380 U	370 U	280 J	230 J	140 J	150 J	200 J	400 U	610	410 U	360 U	360 J
Di-n-octylphthalate	1.0%	19	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Benzo(b)fluoranthene	1.0%	180	1100	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
benzo(k)fluoranthene	1.0%	190	1100	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Benzo(a)pyrene	1.0%	150	61 or MDL	1	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	380 U	370 U	420 U	380 U	390 U	390 U	360 U	400 U	410 U	410 U	360 U	380 U

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 0-2 01/14/93 GB28-1	OB 2-4 01/14/93 GB28-2	OB 0-2 01/19/93 GB29-1	OB 2-4 01/19/93 GB29-2	OB 0-2 01/19/93 GB29-4	OB 0-2 01/18/93 GB30-1	OB 4-6 01/18/93 GB30-3	OB 0-2 01/15/93 GB31-1	OB 2-4 01/15/93 GB31-2	OB 0-2 01/15/93 GB32-1	OB 4-5 01/15/93 GB32-3	OB 0-2 01/18/93 GB33-1
Pesticides/PCBs (ug/kg)																
beta-BHC	0.0%	0	200	0	1.9 U	1.9 U	2.2 U	1.9 U	2 U	2 U	1.8 U	2.1 U	2.1 U	2.1 U	1.9 U	2 U
delta-BHC	0.0%	0	300	0	1.9 U	1.9 U	2.2 U	1.9 U	2 U	2 U	1.8 U	2.1 U	2.1 U	2.1 U	1.9 U	2 U
gamma-BHC (Lindane)	0.0%	0	60	0	1.9 U	1.9 U	2.2 U	1.9 U	2 U	2 U	1.8 U	2.1 U	2.1 U	2.1 U	1.9 U	2 U
Heptachlor	0.0%	0	100	0	1.9 U	1.9 U	2.2 U	1.9 U	2 U	2 U	1.8 U	2.1 U	2.1 U	2.1 U	1.9 U	2 U
Aldrin	1.1%	2.5	41	0	1.9 U	1.9 U	2.2 U	1.9 U	2 U	2 U	1.8 U	2.1 U	2.1 U	2.1 U	1.9 U	2 U
Heptachlor epoxide	0.0%	0	20	0	1.9 U	1.9 U	2.2 U	1.9 U	2 U	2 U	1.8 U	2.1 U	2.1 U	2.1 U	1.9 U	2 U
Endosulfan I	1.1%	1.3	900	0	1.9 U	1.9 U	2.2 U	1.9 U	2 U	2 U	1.8 U	2.1 U	2.1 U	2.1 U	1.9 U	2 U
Dieldrin	0.0%	0	44	0	3.7 U	3.7 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U	4 U	4.1 U	4 U	3.7 U	3.9 U
4,4'-DDE	5.4%	32	2100	0	3.7 U	3.7 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U	2.4 J	4.1 U	4 U	3.7 U	3.9 U
Endrin	0.0%	0	100	0	3.7 U	3.7 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U	4 U	4.1 U	4 U	3.7 U	3.9 U
Endosulfan II	0.0%	0	900	0	3.7 U	3.7 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U	4 U	4.1 U	4 U	3.7 U	3.9 U
4,4'-DDD	1.1%	4.2	2900	0	3.7 U	3.7 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U	4 U	4.1 U	4 U	3.7 U	3.9 U
Endosulfan sulfate	0.0%	0	1000	0	3.7 U	3.7 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U	4 U	4.1 U	4 U	3.7 U	3.9 U
4,4'-DDT	2.2%	5.3	2100	0	3.7 U	3.7 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U	4 U	4.1 U	4 U	3.7 U	3.9 U
Endrin aldehyde	0.0%	0		NA	3.7 U	3.7 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U	4 U	4.1 U	4 U	3.7 U	3.9 U
alpha-Chlordane	0.0%	0	540	0	1.9 U	1.9 U	2.2 U	1.9 U	2 U	2 U	1.8 U	2.1 U	2.1 U	2.1 U	1.9 U	2 U
Aroclor-1254	1.1%	430	1000	0	37 U	37 U	42 U	38 U	39 U	39 U	36 U	40 U	41 U	40 U	37 U	39 U
Aroclor-1260	1.1%	240	1000	0	37 U	37 U	42 U	38 U	39 U	39 U	36 U	40 U	41 U	40 U	37 U	39 U
Explosives (ug/kg)																
HMX	1.1%	75		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
RDX	4.4%	240		NA	120 U	120 U	98 J	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
1,3,5-Trinitrobenzene	7.8%	280		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
1,3-Dinitrobenzene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Tetryl	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4,6-Trinitrotoluene	5.6%	350		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	10.0%	430		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2-amino-4,6-Dinitrotoluene	13.3%	370		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,6-Dinitrotoluene	1.1%	67	1000	0	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4-Dinitrotoluene	13.3%	2400		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Metals (mg/kg)																
Aluminum	100.0%	25300	17503.0	33	11000	11600	14200	11400	13000	10900	15000	9880	16400	15200	9750	10700
Antimony	13.2%	26.6	5	12	5.9 UJ	5.3 UJ	6.6 J	6.1 UJ	6.4 UJ	5.8 UJ	5.4 UJ	6.4 UJ	5.7 J	6.2 UJ	6.1 UJ	5.9 UJ
Arsenic	98.9%	18.5	7.5	8	2.2 J	3.3 J	6.4 J	5 J	5.3 J	5.2 J	4 J	7.3 J	2.5 J	6.5 J	4.6 J	4.9 J
Barium	91.2%	4520	300	15	73.4 J	72.9 J	395 J	44.6 J	293 J	100 J	56 J	97.6 J	83.2 J	196 J	65.7 J	70.4 J
Beryllium	61.5%	1.1	1	1	0.55	0.55	0.71	0.49 J	0.56 J	0.55	0.67	0.6	0.79	0.74	0.44 J	0.51 J
Cadmium	56.0%	7	1.8	44	0.34 U	0.31 U	0.35 U	0.35 U	0.37 U	0.33 U	0.31 U	0.37 U	0.32 U	0.35 U	0.35 U	0.34 U
Calcium	100.0%	99000	46825.0	14	75600	54300	23500	1480	25200	99000	6610	1960	10400	60900	61600	82600
Chromium	100.0%	35.4	26.6	38	17.4	20.4	23.6	21	20.6	17.6	27.2	14.4	30.2	21.3	17.4	17.1
Cobalt	100.0%	26.6	30	0	10.3	9.6	13	12.8	9.8	8.4	16	10.1	16.7	10.8	7.3	9.1
Copper	100.0%	1680	25	72	24.6	30.3	179	27.5	104	19.5	36.5	20.2	33.4	33.7	22.2	23.1
Iron	100.0%	39700	32698.0	23	21200	24700	28100	24400	23500	21100	31600	20600	34100	27000	19400	21400
Lead	94.5%	6230	30	48	12.9	15.2	457	26.2	209	11.4	23.1	33.6 R	36.5 R	54.6	26.1 R	17.1
Magnesium	100.0%	16000	9071.1	10	11300	8030	7920	5250	6780	12300	7400	3050	7040	16000	8670	7820
Manganese	100.0%	1650	1065.8	6	440	363	721	233	476	475	381	511	630	737	304	455
Mercury	71.4%	1.1	0.1	18	0.05 J	0.04 J	0.04 J	0.04 J	0.06 J	0.03 U	0.04 J	0.06 J	0.03 J	0.04 J	0.04 J	0.03 J
Nickel	100.0%	76	41.3	38	34.4	37.9	41.6	45	32.6	28.9	61.8	20.1	54.1	32.6	30.3	32.5
Potassium	100.0%	3170	1529.6	35	1270	1050	1440	909	1280	1230	1230	646	1100	1250	1050	1260
Selenium	40.7%	1.5	2	0	0.63 J	0.73 J	0.52 J	0.22 UJ	0.22 UJ	0.23 UJ	0.19 UJ	0.7 J	0.69 J	0.66 J	0.77 J	0.19 UJ
Silver	7.7%	3.7	0.6	3	0.35 U	0.32 U	0.36 U	0.36 U	0.44 R	0.35 R	0.33 R	0.44 R	0.33 U	0.36 U	0.48 R	0.35 U
Sodium	72.5%	227	76	36	165 J	120 J	87 J	38.6 J	85 J	188 J	66.9 J	35.2 U	52.5 J	149 J	139 J	160 J
Thallium	9.9%	0.8	0.3	9	0.38 U	0.46 U	0.51 U	0.52 U	0.51 U	0.54 U	0.45 U	0.4 U	0.62 U	0.42 U	0.53 U	0.45 U
Vanadium	100.0%	38.6	150	0	17.5	17.7	24.5	15.8	21.9	17.5	20.8	18.2	22	26.7	14.4	17.1
Zinc	100.0%	1200	89.1	58	70.3	84.9	162 J	83.8	684 J	68.9	171	44.4	75.6	89.4	52.7	68.9
Cyanide	1.1%	2.6	NA	NA	0.65 U	0.59 U	0.75 U	0.69 U	0.72 U	0.71 U	0.62 U	0.72 U	0.72 U	0.72 U	0.64 U	0.7 U

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 2-4 01/18/93 GB33-2	OB 0-2 01/19/93 GB34-1	OB 6-8 01/19/93 GB34-4	OB 0-2 01/20/93 GB35-1	OB 2-4 01/20/93 GB35-2	OB 0-2 01/20/93 GB35-6	OB 0-2 01/20/93 GB36-1	OB 2-4 01/20/93 GB36-2	OB 0-2 01/11/93 MW36-1	OB 4-5 5 01/11/93 MW36-3	OB 0-2 01/11/93 MW36-6
VOCs (ug/kg)															
Methylene Chloride	2.1%	4	100	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
Acetone	0.0%	0	200	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
Chloroform	5.3%	13	300	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
2-Butanone	0.0%	0	300	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
1,1,1-Trichloroethane	0.0%	0	800	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
Carbon Tetrachloride	0.0%	0	600	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
Trichloroethene	3.2%	100	700	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
Benzene	0.0%	0	60	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
Tetrachloroethene	5.3%	15	1400	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
Toluene	3.2%	3	1500	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
Chlorobenzene	0.0%	0	1700	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
Xylene (total)	0.0%	0	1200	0	11 U	12 U	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	12 U
Semivolatiles (ug/kg)															
Phenol	0.0%	0	30 or MDL	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
2-Methylphenol	0.0%	0	100 or MDL	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
4-Methylphenol	0.0%	0	900	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Benzoic acid	0.0%	0	2700	0	N	N	N	N	N	N	N	N	N	N	N
Naphthalene	0.0%	0	13,000	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
2-Methylnaphthalene	0.0%	0	36,400	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
2-Chloronaphthalene	0.0%	0	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
2-Nitroaniline	0.0%	0	430 or MDL	0	880 U	950 U	880 U	1000 U	880 U	1000 U	940 U	840 U	880 U	860 U	970 U
Acenaphthylene	0.0%	0	41,000	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
2,6-Dinitrotoluene	6.1%	340	1000	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
3-Nitroaniline	0.0%	0	500 or MDL	0	880 U	950 U	880 U	1000 U	880 U	1000 U	940 U	840 U	880 U	860 U	970 U
Acenaphthene	0.0%	0	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Dibenzofuran	0.0%	0	6200	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
2,4-Dinitrotoluene	13.1%	4200	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Diethylphthalate	11.1%	94	7100	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Fluorene	0.0%	0	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
N-Nitrosodiphenylamine	10.1%	1000	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Hexachlorobenzene	3.0%	90	410	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Pentachlorophenol	1.0%	140	1000 or MDL	0	880 U	950 U	880 U	1000 U	880 U	1000 U	940 U	840 U	880 U	860 U	970 U
Phenanthrene	1.0%	290	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Anthracene	1.0%	18	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Carbazole	0.0%	0	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Di-n-butylphthalate	32.3%	1500	8100	0	33 J	33 J	63 J	420 U	12 J	15 J	390 U	350 U	360 U	350 U	400 U
Fluoranthene	3.0%	480	50,000*	0	360 U	390 U	360 U	420 U	360 U	24 J	390 U	350 U	360 U	350 U	400 U
Pyrene	3.0%	300	50,000*	0	360 U	390 U	360 U	420 U	360 U	16 J	390 U	350 U	360 U	350 U	400 U
Butylbenzylphthalate	1.0%	64	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Benzo(a)anthracene	1.0%	200	220 or MDL	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Chrysene	1.0%	250	400	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
bis(2-Ethylhexyl)phthalate	37.4%	1400	50,000*	0	180 J	500	440	400 J	360 U	420 U	390 U	350 U	290 J	220 J	520
Di-n-octylphthalate	1.0%	19	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Benzo(b)fluoranthene	1.0%	180	1100	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
benzo(k)fluoranthene	1.0%	190	1100	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Benzo(a)pyrene	1.0%	150	61 or MDL	1	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	360 U	390 U	360 U	420 U	360 U	420 U	390 U	350 U	360 U	350 U	400 U

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TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 2-4 01/18/93 GB33-2	OB 0-2 01/19/93 GB34-1	OB 6-8 01/19/93 GB34-4	OB 0-2 01/20/93 GB35-1	OB 2-4 01/20/93 GB35-2	OB 0-2 01/20/93 GB35-6	OB 0-2 01/20/93 GB36-1	OB 2-4 01/20/93 GB36-2	OB 0-2 01/11/93 MW36-1	OB 4-5.5 01/11/93 MW36-3	OB 0-2 01/11/93 MW36-6
Pesticides/PCBs (ug/kg)															
beta-BHC	0.0%	0	200	0	1.9 U	2 U	1.9 U	2.1 U	1.9 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2 U
delta-BHC	0.0%	0	300	0	1.9 U	2 U	1.9 U	2.1 U	1.9 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2 U
gamma-BHC (Lindane)	0.0%	0	60	0	1.9 U	2 U	1.9 U	2.1 U	1.9 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2 U
Heptachlor	0.0%	0	100	0	1.9 U	2 U	1.9 U	2.1 U	1.9 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2 U
Aldrin	1.1%	2.5	41	0	1.9 U	2 U	2.5 J	2.1 U	1.9 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2 U
Heptachlor epoxide	0.0%	0	20	0	1.9 U	2 U	1.9 U	2.1 U	1.9 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2 U
Endosulfan I	1.1%	1.3	900	0	1.9 U	2 U	1.9 U	2.1 U	1.9 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2 U
Dieldrin	0.0%	0	44	0	3.6 U	3.9 U	3.6 U	4.2 U	3.6 U	4.2 U	3.9 U	3.5 U	3.8 U	3.6 U	4 U
4,4'-DDE	5.4%	32	2100	0	3.6 U	12	3.6 U	4.2 U	3.6 U	4.2 U	3.9 U	3.5 U	3.8 U	3.6 U	4 U
Endrin	0.0%	0	100	0	3.6 U	3.9 U	3.6 U	4.2 U	3.6 U	4.2 U	3.9 U	3.5 U	3.8 U	3.6 U	4 U
Endosulfan II	0.0%	0	900	0	3.6 U	3.9 U	3.6 U	4.2 U	3.6 U	4.2 U	3.9 U	3.5 U	3.8 U	3.6 U	4 U
4,4'-DDD	1.1%	4.2	2900	0	3.6 U	3.9 U	3.6 U	4.2 U	3.6 U	4.2 U	3.9 U	3.5 U	3.8 U	3.6 U	4 U
Endosulfan sulfate	0.0%	0	1000	0	3.6 U	3.9 U	3.6 U	4.2 U	3.6 U	4.2 U	3.9 U	3.5 U	3.8 U	3.6 U	4 U
4,4'-DDT	2.2%	5.3	2100	0	3.6 U	5.3	3.6 U	4.2 U	3.6 U	4.2 U	3.9 U	3.5 U	3.8 U	3.6 U	4 U
Endrin aldehyde	0.0%	0		NA	3.6 U	3.9 U	3.6 U	4.2 U	3.6 U	4.2 U	3.9 U	3.5 U	3.8 U	3.6 U	4 U
alpha-Chlordane	0.0%	0	540	0	1.9 U	2 U	1.9 U	2.1 U	1.9 U	2.2 U	2 U	1.8 U	2 U	1.9 U	2 U
Aroclor-1254	1.1%	430	1000	0	36 U	39 U	36 U	42 U	36 U	42 U	39 U	35 U	38 U	36 U	40 U
Aroclor-1260	1.1%	240	1000	0	36 U	39 U	36 U	42 U	36 U	42 U	39 U	35 U	38 U	36 U	40 U
Explosives (ug/kg)															
HMX	1.1%	75		NA	120 U	120 U	120 U	75 J	120 U	120 U	120 U	120 U	120 U	120 U	120 U
RDX	4.4%	240		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
1,3,5-Trinitrobenzene	7.8%	280		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
1,3-Dinitrobenzene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Tetryl	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4,6-Trinitrotoluene	5.6%	350		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	10.0%	430		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2-amino-4,6-Dinitrotoluene	13.3%	370		NA	120 U	68 J	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,6-Dinitrotoluene	1.1%	67	1000	0	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4-Dinitrotoluene	13.3%	2400		NA	120 U	82 J	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Metals (mg/kg)															
Aluminum	100.0%	25300	17503.0	33	8670	16100	11300	18000	17600	16200	18100	16200	17900	12700	17900
Antimony	13.2%	26.6	5	12	6 UJ	10.1 J	5.8 UJ	5.8 UJ	6.8 J	6.3 J	5.9 J	5.8 UJ	6.4 UJ	5.7 UJ	6.4 UJ
Arsenic	98.9%	18.5	7.5	8	4.7 J	11.6	5.5	6.2	7.7	5.3	4.6	9.7	5.2 J	2.9 J	5.4 J
Barium	91.2%	4520	300	15	75.4 J	1050	87.3	93.6	61.7	61.7	74.8	50.8	118 J	46.9 J	95.6 J
Beryllium	61.5%	1.1	1	1	0.42 J	0.71	0.52 J	0.85	0.74	0.77	0.77	0.65	0.94	0.59	0.81
Cadmium	56.0%	7	1.8	44	0.34 U	1.3	0.33 U	0.33 U	0.31 U	0.35 U	0.3 U	0.33 U	0.36 U	0.33 U	0.37 U
Calcium	100.0%	99000	46825.0	14	77900	9790	68200	1590	17700	1370	1660	22900	19800	4170	9720
Chromium	100.0%	35.4	26.6	38	14.1	25.4	19.2	23.5	29.3	25.1	24.8	27.4	27.5 J	23.3 J	24.9 J
Cobalt	100.0%	26.6	30	0	7.1	11.2	11	9.4	16.3	10.3	20.4	13.2	13.6	18.6	8.2
Copper	100.0%	1680	25	72	20.7	482	29	17.5	24.5	17.2	17.7	17.5	30.3 J	19.2 J	26.8 J
Iron	100.0%	39700	32698.0	23	18300	26900	22100	25200	34200	30800	26100	30700	33700	27500	32800
Lead	94.5%	6230	30	48	8.7	1350	22.8	14.4	5.4	19.1	12.7	6.2	14.5	20.2	15.9
Magnesium	100.0%	16000	9071.1	10	13200	5810	8990	3850	7790	4490	4490	7150	6820	5750	5040
Manganese	100.0%	1650	1065.8	6	355	501	415	701	646	775	426	507	608	540	311
Mercury	71.4%	1.1	0.1	18	0.04 J	0.24 J	0.02 J	0.06 J	0.03 U	0.07 J	0.02 J	0.02 J	0.04 J	0.02 J	0.07 J
Nickel	100.0%	76	41.3	38	29.1	32.4	37.6	26.3	48.7	28.3	28.3	42.8	46.1 J	43.3 J	28.2 J
Potassium	100.0%	3170	1529.6	35	1190	1710	1580	1110	1110	975	1400	1100	1350	754	1220
Selenium	40.7%	1.5	2	0	0.17 UJ	0.26 UJ	0.24 UJ	0.23 UJ	0.23 UJ	0.21 UJ	0.2 UJ	0.18 UJ	0.19 UJ	0.19 UJ	0.22 UJ
Silver	7.7%	3.7	0.6	3	0.35 U	0.38 U	0.34 U	0.34 U	0.32 U	0.36 U	0.31 U	0.34 U	0.38 J	0.34 U	0.38 U
Sodium	72.5%	227	76	36	154 J	89.5 J	154 J	35.6 J	77.5 J	34.6 J	46.6 J	97.6 J	56.2 J	31.6 U	35.2 U
Thallium	9.9%	0.8	0.3	9	0.41 U	0.62 U	0.56 U	0.55 U	0.54 U	0.5 U	0.46 U	0.43 U	0.45 U	0.45 U	0.53 U
Vanadium	100.0%	38.6	150	0	14.3	25.4	17	27.1	22.3	26.1	27.8	19.7	29.2 J	16.2 J	30.8 J
Zinc	100.0%	1200	89.1	58	75.2	312	75.5	55	83.4	53.1	59.2	74.1	97.6 J	34.7 J	56 J
Cyanide	1.1%	2.6	NA	NA	0.66 U	0.72 U	0.71 U	0.78 U	0.71 U	0.82 U	0.7 U	0.68 U	0.56 U	0.56 U	0.6 U

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TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 0-2 01/11/93 MW37-1	OB 2-4 01/11/93 MW37-2	OB 0-2 01/08/93 MW38-1	OB 4-6 01/08/93 MW38-3	OB 0-2 01/07/93 MW39-1	OB 4-6 01/07/93 MW39-3	OB 0-2 01/07/93 MW40-1	OB 2-4 01/07/93 MW40-2	OB 0-2 01/12/93 MW41-1	OB 2-4 01/12/93 MW41-2
VOCs (ug/kg)														
Methylene Chloride	2.1%	4	100	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
Acetone	0.0%	0	200	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
Chloroform	5.3%	13	300	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
2-Butanone	0.0%	0	300	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
1,1,1-Trichloroethane	0.0%	0	800	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
Carbon Tetrachloride	0.0%	0	600	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
Trichloroethene	3.2%	100	700	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
Benzene	0.0%	0	60	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
Tetrachloroethene	5.3%	15	1400	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
Toluene	3.2%	3	1500	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	3 J
Chlorobenzene	0.0%	0	1700	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
Xylene (total)	0.0%	0	1200	0	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	13 U	12 U
Semivolatiles (ug/kg)														
Phenol	0.0%	0	30 or MDL	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
2-Methylphenol	0.0%	0	100 or MDL	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
4-Methylphenol	0.0%	0	900	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Benzoic acid	0.0%	0	2700	0	N	N	N	N	N	N	N	N	N	N
Naphthalene	0.0%	0	13,000	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
2-Methylnaphthalene	0.0%	0	36,400	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
2-Chloronaphthalene	0.0%	0	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
2-Nitroaniline	0.0%	0	430 or MDL	0	910 U	940 U	980 U	930 U	1000 U	900 U	990 U	1000 U	1100 U	940 U
Acenaphthylene	0.0%	0	41,000	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
2,6-Dinitrotoluene	6.1%	340	1000	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
3-Nitroaniline	0.0%	0	500 or MDL	0	910 U	940 U	980 U	930 U	1000 U	900 U	990 U	1000 U	1100 U	940 U
Acenaphthene	0.0%	0	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Dibenzofuran	0.0%	0	6200	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
2,4-Dinitrotoluene	13.1%	4200	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Diethylphthalate	11.1%	94	7100	0	370 U	390 U	400 U	55 J	50 J	370 U	18 J	16 J	440 U	20 J
Fluorene	0.0%	0	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
N-Nitrosodiphenylamine	10.1%	1000	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Hexachlorobenzene	3.0%	90	410	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Pentachlorophenol	1.0%	140	1000 or MDL	0	910 U	940 U	980 U	930 U	1000 U	900 U	990 U	1000 U	1100 U	940 U
Phenanthrene	1.0%	290	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Anthracene	1.0%	18	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Carbazole	0.0%	0	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Di-n-butylphthalate	32.3%	1500	8100	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Fluoranthene	3.0%	480	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Pyrene	3.0%	300	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Butylbenzylphthalate	1.0%	64	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Benzo(a)anthracene	1.0%	200	220 or MDL	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Chrysene	1.0%	250	400	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
bis(2-Ethylhexyl)phthalate	37.4%	1400	50,000*	0	340 J	540	420 U	600 U	850 U	380 U	640 U	560 U	440 U	240 J
Di-n-octylphthalate	1.0%	19	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Benzo(b)fluoranthene	1.0%	180	1100	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
benzo(k)fluoranthene	1.0%	190	1100	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Benzo(a)pyrene	1.0%	150	61 or MDL	1	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	370 U	390 U	400 U	380 U	420 U	370 U	410 U	410 U	440 U	390 U

TABLE 2-10

GRID BORINGS
SUMMARY OF COMPOUNDS DETECTED

OPEN BURNING GROUNDS
SENECA ARMY DEPOT

COMPOUND	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 0-2 01/11/93 MW37-1	OB 2-4 01/11/93 MW37-2	OB 0-2 01/08/93 MW38-1	OB 4-6 01/08/93 MW38-3	OB 0-2 01/07/93 MW39-1	OB 4-6 01/07/93 MW39-3	OB 0-2 01/07/93 MW40-1	OB 2-4 01/07/93 MW40-2	OB 0-2 01/12/93 MW41-1	OB 2-4 01/12/93 MW41-2
Pesticides/PCBs (ug/kg)														
beta-BHC	0.0%	0	200	0	1.9 U	2 U	2.1 U	2 U	2.2 U	1.9 U	2.2 U	2.2 U	2.2 U	2 U
delta-BHC	0.0%	0	300	0	1.9 U	2 U	2.1 U	2 U	2.2 U	1.9 U	2.2 U	2.2 U	2.2 U	2 U
gamma-BHC (Lindane)	0.0%	0	60	0	1.9 U	2 U	2.1 U	2 U	2.2 U	1.9 U	2.2 U	2.2 U	2.2 U	2 U
Heptachlor	0.0%	0	100	0	1.9 U	2 U	2.1 U	2 U	2.2 U	1.9 U	2.2 U	2.2 U	2.2 U	2 U
Aldrin	1.1%	2.5	41	0	1.9 U	2 U	2.1 U	2 U	2.2 U	1.9 U	2.2 U	2.2 U	2.2 U	2 U
Heptachlor epoxide	0.0%	0	20	0	1.9 U	2 U	2.1 U	2 U	2.2 U	1.9 U	2.2 U	2.2 U	2.2 U	2 U
Endosulfan I	1.1%	1.3	900	0	1.9 U	2 U	2.1 U	2 U	2.2 U	1.9 U	2.2 U	2.2 U	2.2 U	2 U
Dieldrin	0.0%	0	44	0	3.8 U	3.9 U	4.1 U	3.8 U	4.3 U	3.7 U	4.2 U	4.2 U	4.4 U	3.9 U
4,4'-DDE	5.4%	32	2100	0	3.8 U	3.9 U	4.1 U	3.8 U	4.3 U	3.7 U	4.2 U	4.2 U	4.4 U	3.9 U
Endrin	0.0%	0	100	0	3.8 U	3.9 U	4.1 U	3.8 U	4.3 U	3.7 U	4.2 U	4.2 U	4.4 U	3.9 U
Endosulfan II	0.0%	0	900	0	3.8 U	3.9 U	4.1 U	3.8 U	4.3 U	3.7 U	4.2 U	4.2 U	4.4 U	3.9 U
4,4'-DDD	1.1%	4.2	2900	0	3.8 U	3.9 U	4.1 U	3.8 U	4.3 U	3.7 U	4.2 U	4.2 U	4.4 U	3.9 U
Endosulfan sulfate	0.0%	0	1000	0	3.8 U	3.9 U	4.1 U	3.8 U	4.3 U	3.7 U	4.2 U	4.2 U	4.4 U	3.9 U
4,4'-DDT	2.2%	5.3	2100	0	3.8 U	3.9 U	4.1 U	3.8 U	4.3 U	3.7 U	4.2 U	4.2 U	4.4 U	3.9 U
Endrin aldehyde	0.0%	0		NA	3.8 U	3.9 U	4.1 U	3.8 U	4.3 U	3.7 U	4.2 U	4.2 U	4.4 U	3.9 U
alpha-Chlordane	0.0%	0	540	0	1.9 U	2 U	2.1 U	2 U	2.2 U	1.9 U	2.2 U	2.2 U	2.2 U	2 U
Aroclor-1254	1.1%	430	1000	0	38 U	39 U	41 U	38 U	43 U	37 U	42 U	42 U	44 U	39 U
Aroclor-1260	1.1%	240	1000	0	38 U	39 U	41 U	38 U	43 U	37 U	42 U	42 U	44 U	39 U
Explosives (ug/kg)														
HMX	1.1%	75		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
RDX	4.4%	240		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
1,3,5-Trinitrobenzene	7.8%	280		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
1,3-Dinitrobenzene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Tetryl	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4,6-Trinitrotoluene	5.6%	350		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	10.0%	430		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2-amino-4,6-Dinitrotoluene	13.3%	370		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,6-Dinitrotoluene	1.1%	67	1000	0	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4-Dinitrotoluene	13.3%	2400		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Metals (mg/kg)														
Aluminum	100.0%	25300	17503.0	33	12600	15400	25100	16700	20200	14400	20200	17700	13700	16500
Antimony	13.2%	26.6	5	12	5.5 UJ	5.9 UJ	6.2 UJ	6.2 UJ	6 UJ	5.2 UJ	6.3 UJ	6.2 UJ	6.7 UJ	6.4 UJ
Arsenic	98.9%	18.5	7.5	8	4.9 J	6 J	4.1 J	4 J	4.6 J	4.7 J	5.1 J	5.1 J	3.5 J	5 J
Barium	91.2%	4520	300	15	58.6 J	115 J	118 J	65.9 J	147 J	60.2 J	152 J	78 J	53 J	79.2 J
Beryllium	61.5%	1.1	1	1	0.58	0.83	1.5	0.85	1	0.66	0.99	0.89	0.76	0.81
Cadmium	56.0%	7	1.8	44	0.32 U	0.34 U	0.35 U	0.35 U	0.34 U	0.3 U	0.36 U	0.35 U	0.38 U	0.36 U
Calcium	100.0%	99000	46825.0	14	6080	11100	2690	10000	4700	2330	3650	3420	1170	9540
Chromium	100.0%	35.4	26.6	38	17.8 J	25.1 J	34.6 J	27.7 J	28.4 J	26.8 J	32.6 J	33.1 J	20.7 J	29.1 J
Cobalt	100.0%	26.6	30	0	12.3	11.2	15.9	16.3	12.8	13.9	18.2	15.6	15.7	15.2
Copper	100.0%	1680	25	72	20.1 J	32 J	40.8 J	42 J	35.3 J	54.7 J	57.1 J	72.1 J	24.2 J	42.1 J
Iron	100.0%	39700	32698.0	23	23300	28900	32800	31100	31400	30600	38000	37700	27000	34800
Lead	94.5%	6230	30	48	15.7	17.8	18.9	38.6	39	34.1	42	42	30.8	32.2
Magnesium	100.0%	16000	9071.1	10	3770	7480	6450	6240	5260	6170	6620	7400	3990	7000
Manganese	100.0%	1650	1065.8	6	437	647	297	379	574	395	1480	611	497	423
Mercury	71.4%	1.1	0.1	18	0.08 J	0.03 J	0.06 J	0.04 J	0.36	0.03 U	0.44	0.05 J	0.13	0.07 J
Nickel	100.0%	76	41.3	38	23.2 J	42.7 J	49.8 J	50.4 J	36.9 J	57 J	76 J	73.9 J	26.4 J	59.5 J
Potassium	100.0%	3170	1529.6	35	827	1180	2950	1800	1920	1580	2130	1810	770	1020
Selenium	40.7%	1.5	2	0	0.22 UJ	0.23 UJ	0.21 UJ	0.21 UJ	0.52 J	0.94 J	0.27 J	0.25 UJ	0.23 UJ	0.19 UJ
Silver	7.7%	3.7	0.6	3	0.33 U	0.49 J	0.36 U	0.37 U	0.35 U	0.31 U	0.39 J	0.4 J	0.4 U	0.38 U
Sodium	72.5%	227	76	36	30.6 U	44.4 J	64.3 J	67.4 J	48.4 J	52.1 J	44 J	67.7 J	37 U	35.7 J
Thallium	9.9%	0.8	0.3	9	0.52 U	0.54 U	0.49 U	0.5 U	0.55 U	0.56 U	0.56 J	0.6 U	0.55 U	0.46 U
Vanadium	100.0%	38.6	150	0	20.9 J	24.3 J	38.1 J	24.8 J	33.4 J	23.4 J	35.2 J	32.7 J	22.7 J	24.3 J
Zinc	100.0%	1200	89.1	58	63.3 J	87 J	90.6 J	120 J	91.6 J	74.8 J	99.3 J	114 J	54.5 J	78.7 J
Cyanide	1.1%	2.6	NA	NA	0.58 U	2.6	0.62 U	0.58 U	0.67 U	0.57 U	0.63 U	0.65 U	0.78 U	0.71 U

NOTES:
a) * = As per proposed TAGM. Total VOCs <10 ppm, Total Semi-VOCs <500 ppm, Individual Semi-VOCs <50 ppm.
For certain metals, the TAGM is equal to the greater value between the proposed TAGM and site background.
The number of samples above the TAGM was determined by comparison to the actual number given, not the MDL.
b) The TAGM for 1,2-Dichloroethene (trans) was used for 1,2-Dichloroethene (total) since it was the only value available.
c) NA = not applicable
d) N = Compound was not analyzed.
e) U = Compound was not detected.
f) J = The reported value is an estimated concentration.
g) R = The data was rejected in the data validation process.
h) SB = Site background
i) MDL = Method detection limit

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TABLE 2-11

SUMMARY OF COMPOUNDS DETECTED
LOW HILL SOILS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 2.0 12/10/92 LH-01	OB 2.0 12/10/92 LH-02	OB 2.0 12/10/92 LH-02RE	OB 2.0 12/10/92 LH-04	OB 2.0 12/10/92 LH-06	OB 2.0 12/10/92 LH-07	OB 2.0 12/10/92 LH-09	OB 2.0 12/09/92 LH-14	OB 2.0 12/09/92 LH-16
VOCs (ug/kg)													
Methylene Chloride	0.0%	0	100	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
Acetone	0.0%	0	200	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
Chloroform	0.0%	0	300	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
2-Butanone	0.0%	0	300	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
1,1,1-Trichloroethane	0.0%	0	800	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
Carbon Tetrachloride	0.0%	0	600	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
Trichloroethene	0.0%	0	700	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
Benzene	0.0%	0	60	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
Tetrachloroethene	0.0%	0	1400	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
Toluene	0.0%	0	1500	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
Chlorobenzene	0.0%	0	1700	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
Xylene (total)	0.0%	0	1200	0	12 U	12 U	N	N	12 U	12 U	12 U	12 U	13 U
Semivolatiles (ug/kg)													
Phenol	0.0%	0	30 or MDL	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
2-Methylphenol	0.0%	0	100 or MDL	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
4-Methylphenol	0.0%	0	900	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Benzoic Acid	NA	NA	2700	0	N	N	N	N	N	N	N	N	N
Naphthalene	0.0%	0	13,000	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
2-Methylnaphthalene	0.0%	0	36,400	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
2-Chloronaphthalene	0.0%	0	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
2-Nitroaniline	0.0%	0	430 or MDL	0	990 U	990 U	980 U	N	980 U	1000 U	980 U	990 U	1000 U
Acenaphthylene	0.0%	0	41,000	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
2,6-Dinitrotoluene	0.0%	0	1000	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
3-Nitroaniline	0.0%	0	500 or MDL	0	990 U	990 U	980 U	N	980 U	1000 U	980 U	990 U	1000 U
Acenaphthene	0.0%	0	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Dibenzofuran	0.0%	0	6200	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
2,4-Dinitrotoluene	0.0%	0	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Diethylphthalate	0.0%	0	7100	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Fluorene	0.0%	0	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
N-Nitrosodiphenylamine	8.0%	110	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Hexachlorobenzene	0.0%	0	410	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	990 U	990 U	980 U	N	980 U	1000 U	980 U	990 U	1000 U
Phenanthrene	0.0%	0	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Anthracene	0.0%	0	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Carbazole	0.0%	0	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Di-n-butylphthalate	36.0%	460	8100	0	15 J	410 U	400 U	N	24 J	410 U	410 U	16 J	15 J
Fluoranthene	12.0%	21	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Pyrene	20.0%	17	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Butylbenzylphthalate	0.0%	0	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Benzo(a)anthracene	0.0%	0	220 or MDL	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Chrysene	0.0%	0	400	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
bis(2-Ethylhexyl)phthalate	16.0%	460	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Di-n-octylphthalate	0.0%	0	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Benzo(b)fluoranthene	0.0%	0	1100	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Benzo(k)fluoranthene	0.0%	0	1100	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Benzo(a)pyrene	0.0%	0	61 or MDL	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	410 U	410 U	400 U	N	410 U	410 U	410 U	410 U	410 U

TABLE 2-11

SUMMARY OF COMPOUNDS DETECTED
LOW HILL SOILS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 2.0 12/10/92 LH-01	OB 2.0 12/10/92 LH-02	OB 2.0 12/10/92 LH-02RE	OB 2.0 12/10/92 LH-04	OB 2.0 12/10/92 LH-06	OB 2.0 12/10/92 LH-07	OB 2.0 12/10/92 LH-09	OB 2.0 12/09/92 LH-14	OB 2.0 12/09/92 LH-16
Pesticides/PCBs (ug/kg)													
beta-BHC	0.0%	0	200	0	2.1 U	2.1 U	N	N	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
delta-BHC	8.3%	1.2	300	0	2.1 U	2.1 U	N	N	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
gamma-BHC (Lindane)	0.0%	0	60	0	2.1 U	2.1 U	N	N	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Heptachlor	0.0%	0	100	0	2.1 U	2.1 U	N	N	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Aldrin	0.0%	0	41	0	2.1 U	2.1 U	N	N	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Heptachlor epoxide	0.0%	0	20	0	2.1 U	2.1 U	N	N	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Endosulfan I	0.0%	0	900	0	2.1 U	2.1 U	N	N	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Dieldrin	4.2%	5.8	44	0	4 U	4.1 U	N	N	4.1 U	4.1 U	4 U	4.1 U	4.1 U
4,4'-DDE	12.5%	6.4	2100	0	1.8 J	4.1 U	N	N	4.1 U	4.1 U	4 U	4.1 U	4.1 U
Endrin	0.0%	0	100	0	4 U	4.1 U	N	N	4.1 U	4.1 U	4 U	4.1 U	4.1 U
Endosulfan II	0.0%	0	900	0	4 U	4.1 U	N	N	4.1 U	4.1 U	4 U	4.1 U	4.1 U
4,4'-DDD	0.0%	0	2900	0	4 U	4.1 U	N	N	4.1 U	4.1 U	4 U	4.1 U	4.1 U
Endosulfan sulfate	0.0%	0	1000	0	4 U	4.1 U	N	N	4.1 U	4.1 U	4 U	4.1 U	4.1 U
4,4'-DDT	12.5%	5	2100	0	1.8 J	4.1 U	N	N	4.1 U	4.1 U	4 U	4.1 U	4.1 U
Endrin aldehyde	0.0%	0		NA	4 U	4.1 U	N	N	4.1 U	4.1 U	4 U	4.1 U	4.1 U
alpha-Chlordane	0.0%	0	540	0	2.1 U	2.1 U	N	N	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Aroclor-1254	0.0%	0	1000	0	40 U	41 U	N	N	41 U	41 U	40 U	41 U	41 U
Aroclor-1260	0.0%	0	1000	0	40 U	41 U	N	N	41 U	41 U	40 U	41 U	41 U
Explosives (ug/kg)													
HMX	4.2%	68		NA	120 U	120 U	N	N	120 U	120 U	120 U	120 U	120 U
RDX	16.7%	140		NA	120 U	120 U	N	N	120 U	120 U	120 U	120 U	120 U
1,3,5-Trinitrobenzene	4.2%	66		NA	120 U	120 U	N	N	120 U	120 U	120 U	120 U	120 U
1,3-Dinitrotoluene	0.0%	0		NA	120 U	120 U	N	N	120 U	120 U	120 U	120 U	120 U
Tetryl	0.0%	0		NA	120 U	120 U	N	N	120 U	120 U	120 U	120 U	120 U
2,4,6-Trinitrotoluene	0.0%	0		NA	120 U	120 U	N	N	120 U	120 U	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	0.0%	0		NA	120 U	120 U	N	N	120 U	120 U	120 U	120 U	120 U
4-amino-4,6-Dinitrotoluene	0.0%	0		NA	120 U	120 U	N	N	120 U	120 U	120 U	120 U	120 U
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	N	N	120 U	120 U	120 U	120 U	120 U
2,4-Dinitrotoluene	4.2%	520		NA	120 U	120 U	N	N	120 U	120 U	120 U	120 U	120 U
Metals (mg/kg)													
Aluminum	100.0%	20000.00	17503.0	7	18100	15600	N	16000	N	14900	14200	19700	20000
Antimony	12.5%	8.20	5	3	5.9 UJ	5.2 UJ	N	7.7 UJ	N	5.4 UJ	6.3 UJ	6.7 UJ	6.7 UJ
Arsenic	100.0%	6.90	7.5	0	4.8	6.9	N	5.2	N	4.5	4.6	4.4	4.7
Barium	100.0%	656.00	300	2	100	74.6	N	107	N	126	127	150	160
Beryllium	100.0%	1.10	1	2	0.87	0.79	N	0.8	N	0.83	0.78	0.98	1.1
Cadmium	54.2%	2.70	1.8	1	0.34 U	0.3 U	N	0.47 J	N	0.44 J	0.57 J	0.45 J	0.38 U
Calcium	100.0%	6780.00	46825.0	0	3680	1810	N	2090	N	2370	5800	4370	5330
Chromium	100.0%	28.40	26.6	3	22.7	27.6	N	21.4	N	19.1	22	26.7	25.9
Cobalt	100.0%	13.80	30	0	9.9	11.5	N	11.1	N	11.8	10.8	11.4	11.2
Copper	100.0%	427.00	25	19	23	31.7	N	24.5	N	20.3	26.7	30.3	27.2
Iron	100.0%	30100.00	32698.0	0	25900	27300	N	30100	N	23300	23400	27000	26800
Lead	100.0%	1530.00	30	24	94.1	42.8	N	45.8	N	37.8	51.2	41.3	42
Magnesium	100.0%	5750.00	9071.1	0	3680	3540	N	3540	N	3430	3770	4660	4380
Manganese	100.0%	1280.00	1065.8	1	783	944	N	811	N	1280	605	696	857
Mercury	50.0%	0.14	0.1	2	0.15 R	0.11 R	N	0.14 R	N	0.14 R	0.12 R	0.08 R	0.11 R
Nickel	100.0%	32.70	41.3	0	23.9	20.4	N	21.8	N	20.7	24.3	31.9	31.3
Potassium	100.0%	2140.00	1529.6	7	1400	1060	N	858	N	946	1230	2460	2390
Selenium	58.3%	1.10	2	0	0.84	0.59 J	N	0.61 J	N	0.5 J	0.57 J	0.64 J	1.1
Silver	12.5%	0.80	0.6	2	0.35 U	0.31 U	N	0.46 U	N	0.32 U	0.37 U	0.4 U	0.68 J
Sodium	87.5%	67.70	76	0	45 J	29.4 J	N	42.8 U	N	29.7 U	37.5 J	41.6 J	54.6 J
Thallium	0.0%	0.00	0.3	0	0.42 U	0.48 U	N	0.71 U	N	0.49 U	0.58 U	0.47 U	0.38 U
Vanadium	100.0%	33.40	150	0	32.7	27.3	N	29.9	N	26.2	24.9	32.8	33.4
Zinc	100.0%	443.00	89.1	14	110	172	N	74.9	N	80.8	93.8	97.2	88.1
Cyanide	0.0%	0	NA	NA	0.67 U	0.73 U	N	0.88 U	N	0.72 U	0.74 U	0.73 U	0.73 U

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TABLE 2-11

SUMMARY OF COMPOUNDS DETECTED
LOW HILL SOILS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 2.0 12/09/92 LH-17	OB 2.0 12/09/92 LH-18	OB 2.5 12/08/92 LH-21	OB 2.5 12/08/92 LH-210	OB 2.5 12/08/92 LH-23	OB 2.0 03/08/93 LH-26	OB 2.0 03/08/93 LH-27	OB 2.0 03/08/93 LH-28	OB 2.0 03/08/93 LH-29
VOCs (ug/kg)													
Methylene Chloride	0.0%	0	100	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
Acetone	0.0%	0	200	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
Chloroform	0.0%	0	300	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
2-Butanone	0.0%	0	300	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
1,1,1-Trichloroethane	0.0%	0	800	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
Carbon Tetrachloride	0.0%	0	600	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
Trichloroethene	0.0%	0	700	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
Benzene	0.0%	0	60	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
Tetrachloroethene	0.0%	0	1400	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
Toluene	0.0%	0	1500	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
Chlorobenzene	0.0%	0	1700	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
Xylene (total)	0.0%	0	1200	0	13 U	12 U	13 U	13 U	12 U	12 U	12 U	12 U	13 U
Semivolatiles (ug/kg)													
Phenol	0.0%	0	30 or MDL	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
2-Methylphenol	0.0%	0	100 or MDL	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
4-Methylphenol	0.0%	0	900	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Benzoic Acid	NA	NA	2700	0	N	N	N	N	N	N	N	N	N
Naphthalene	0.0%	0	13,000	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
2-Methylnaphthalene	0.0%	0	36,400	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
2-Chloronaphthalene	0.0%	0	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
2-Nitroaniline	0.0%	0	430 or MDL	0	1000 U	990 U	1000 U	1000 U	990 U	950 U	950 U	990 U	1000 U
Acenaphthylene	0.0%	0	41,000	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
2,6-Dinitrotoluene	0.0%	0	1000	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
3-Nitroaniline	0.0%	0	500 or MDL	0	1000 U	990 U	1000 U	1000 U	990 U	950 U	950 U	990 U	1000 U
Acenaphthene	0.0%	0	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Dibenzofuran	0.0%	0	6200	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
2,4-Dinitrotoluene	0.0%	0	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Diethylphthalate	0.0%	0	7100	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Fluorene	0.0%	0	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
N-Nitrosodiphenylamine	8.0%	110	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Hexachlorobenzene	0.0%	0	410	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	1000 U	990 U	1000 U	1000 U	990 U	950 U	950 U	990 U	1000 U
Phenanthrene	0.0%	0	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Anthracene	0.0%	0	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Carbazole	0.0%	0	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Di-n-butylphthalate	36.0%	460	8100	0	27 J	12 J	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Fluoranthene	12.0%	21	50,000*	0	420 U	410 U	16 J	16 J	410 U	390 U	390 U	410 U	420 U
Pyrene	20.0%	17	50,000*	0	420 U	410 U	17 J	15 J	410 U	390 U	390 U	410 U	420 U
Butylbenzylphthalate	0.0%	0	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Benzo(a)anthracene	0.0%	0	220 or MDL	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Chrysene	0.0%	0	400	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
bis(2-Ethylhexyl)phthalate	16.0%	460	50,000*	0	420 U	410 U	410 U	420 U	410 U	460	390 U	270 J	120 J
Di-n-octylphthalate	0.0%	0	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Benzo(b)fluoranthene	0.0%	0	1100	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Benzo(k)fluoranthene	0.0%	0	1100	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Benzo(a)pyrene	0.0%	0	61 or MDL	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	420 U	410 U	410 U	420 U	410 U	390 U	390 U	410 U	420 U

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TABLE 2-11

SUMMARY OF COMPOUNDS DETECTED
LOW HILL SOILS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 2.0 12/09/92 LH-17	OB 2.0 12/09/92 LH-18	OB 2.5 12/08/92 LH-21	OB 2.5 12/08/92 LH-210	OB 2.5 12/08/92 LH-23	OB 2.0 03/08/93 LH-26	OB 2.0 03/08/93 LH-27	OB 2.0 03/08/93 LH-28	OB 2.0 03/08/93 LH-29
Pesticides/PCBs (ug/kg)													
beta-BHC	0.0%	0	200	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2 U	2 U	2.1 U	2.2 U
delta-BHC	8.3%	1.2	300	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2 U	2 U	2.1 U	2.2 U
gamma-BHC (Lindane)	0.0%	0	60	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2 U	2 U	2.1 U	2.2 U
Heptachlor	0.0%	0	100	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2 U	2 U	2.1 U	2.2 U
Aldrin	0.0%	0	41	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2 U	2 U	2.1 U	2.2 U
Heptachlor epoxide	0.0%	0	20	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2 U	2 U	2.1 U	2.2 U
Endosulfan I	0.0%	0	900	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2 U	2 U	2.1 U	2.2 U
Dieldrin	4.2%	5.8	44	0	4.2 U	4.1 U	4.1 U	4.2 U	4.1 U	3.9 U	3.9 U	4.1 U	4.2 U
4,4'-DDE	12.5%	6.4	2100	0	4.2 U	4.1 U	4.1 U	4.2 U	4.1 U	3.9 U	3.9 U	4.1 U	4.2 U
Endrin	0.0%	0	100	0	4.2 U	4.1 U	4.1 U	4.2 U	4.1 U	3.9 U	3.9 U	4.1 U	4.2 U
Endosulfan II	0.0%	0	900	0	4.2 U	4.1 U	4.1 U	4.2 U	4.1 U	3.9 U	3.9 U	4.1 U	4.2 U
4,4'-DDD	0.0%	0	2900	0	4.2 U	4.1 U	4.1 U	4.2 U	4.1 U	3.9 U	3.9 U	4.1 U	4.2 U
Endosulfan sulfate	0.0%	0	1000	0	4.2 U	4.1 U	4.1 U	4.2 U	4.1 U	3.9 U	3.9 U	4.1 U	4.2 U
4,4'-DDT	12.5%	5	2100	0	4.2 U	4.1 U	4.1 U	4.2 U	4.1 U	3.9 U	3.9 U	4.1 U	4.2 U
Endrin aldehyde	0.0%	0		NA	4.2 U	4.1 U	4.1 U	4.2 U	4.1 U	3.9 U	3.9 U	4.1 U	4.2 U
alpha-Chlordane	0.0%	0	540	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2 U	2 U	2.1 U	2.2 U
Aroclor-1254	0.0%	0	1000	0	42 U	41 U	41 U	42 U	41 U	39 U	39 U	41 U	42 U
Aroclor-1260	0.0%	0	1000	0	42 U	41 U	41 U	42 U	41 U	39 U	39 U	41 U	42 U
Explosives (ug/kg)													
HMX	4.2%	68		NA	120 U	120 U	120 U	120 U	120 U	120 U	68 J	120 U	120 U
RDX	16.7%	140		NA	120 U	120 U	120 U	120 U	120 U	140	85 J	89 J	93 J
1,3,5-Trinitrobenzene	4.2%	66		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
1,3-Dinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Tetryl	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4,6-Trinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
4-amino-4,6-Dinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4-Dinitrotoluene	4.2%	520		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Metals (mg/kg)													
Aluminum	100.0%	20000.00	17503.0	7	16700	15900	21800	19100	18600	15800	17400	18700	16200
Antimony	12.5%	8.20	5	3	6.5 UJ	6.5 UJ	6.7 UJ	6.3 UJ	6 UJ	6 UJ	6.1 UJ	6.8 J	5.9 UJ
Arsenic	100.0%	6.90	7.5	0	5	4.9	4.8	5.3	4.8	6.2	5.8	5.8	5.5
Barium	100.0%	656.00	300	2	152	135	136	123	143	165	151	269	149
Beryllium	100.0%	1.10	1	2	0.96	0.9	1.1	1	0.94	0.83	0.78	0.84	0.82
Cadmium	54.2%	2.70	1.8	1	0.44 J	0.39 J	0.38 U	0.36 U	0.91	0.41 J	0.37 J	0.51 J	0.34 U
Calcium	100.0%	6780.00	46825.0	0	3850	3370	2820	2650	2690	6780	2360	3410	2640
Chromium	100.0%	28.40	26.6	3	23.3	22.6	28.4	25.2	26.3	23.6	22.6	25	20.6
Cobalt	100.0%	13.80	30	0	10.9	11.8	12.7	13.8	12.1	11	12.8	10.9	10.6
Copper	100.0%	427.00	25	19	32.2	31.4	27.4	24.4	49.7	98.4	89.2	127	42.6
Iron	100.0%	30100.00	32698.0	0	26400	26400	30000	28700	29100	27400	24900	27900	22700
Lead	100.0%	1530.00	30	24	60.2	46.6	39.1	39.3	64.3	162 J	177 J	415	228 J
Magnesium	100.0%	5750.00	9071.1	0	4080	3960	4740	4270	4700	4690	4020	4690	3710
Manganese	100.0%	1280.00	1065.8	1	775	863	805	1030	765	560	655	542	784
Mercury	50.0%	0.14	0.1	2	0.14 R	0.13 R	0.12 R	0.17 R	0.18 R	0.05 J	0.05 J	0.05 J	0.1 J
Nickel	100.0%	32.70	41.3	0	28.3	28	32.5	28.1	32.7	32.3	26.5	29	25.6
Potassium	100.0%	2140.00	1529.6	7	1740	1350	2140	1590	1860	1360	1680	1870	1270
Selenium	58.3%	1.10	2	0	0.94 J	0.8 J	0.94	0.8 J	0.79 J	0.24 UJ	0.23 UJ	0.23 UJ	0.22 UJ
Silver	12.5%	0.80	0.6	2	0.47 J	0.8 J	0.39 U	0.37 U	0.35 U	0.36 U	0.36 U	0.38 U	0.35 U
Sodium	87.5%	67.70	76	0	45.6 J	41.8 J	54 J	34.6 U	47.7 J	60.8 J	54.5 J	63.8 J	46.4 J
Thallium	0.0%	0.00	0.3	0	0.57 U	0.62 U	0.43 U	0.44 U	0.5 U	0.57 U	0.54 U	0.55 U	0.51 U
Vanadium	100.0%	33.40	150	0	28.5	28	35.4	31.8	30.4	25.9	28.5	30.5	25.3
Zinc	100.0%	443.00	89.1	14	91.3	85.9	98.2	84.8	106	115 J	91.3 J	135 J	79.1 J
Cyanide	0.0%	0	NA	NA	0.73 U	0.71 U	0.6 U	0.76 U	0.73 U	0.71 U	0.72 U	0.73 U	0.75 U

TABLE 2-11

SUMMARY OF COMPOUNDS DETECTED
LOW HILL SOILS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 2.0 03/09/93 LH-31	OB 2.0 03/09/93 LH-32	OB 2.0 03/09/93 LH-33	OB 2.0 03/09/93 LH-35	OB 2.0 03/09/93 LH-35D	OB 2.0 03/09/93 LH-36	OB 2.0 03/09/93 LH-37	OB 2.0 03/09/93 LH-40
VOCs (ug/kg)												
Methylene Chloride	0.0%	0	100	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
Acetone	0.0%	0	200	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
1,2-Dichloroethene (total)	0.0%	0	300 (b)	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
Chloroform	0.0%	0	300	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
2-Butanone	0.0%	0	300	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
1,1,1-Trichloroethane	0.0%	0	800	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
Carbon Tetrachloride	0.0%	0	600	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
Trichloroethene	0.0%	0	700	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
Benzene	0.0%	0	60	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
Tetrachloroethene	0.0%	0	1400	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
Toluene	0.0%	0	1500	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
Chlorobenzene	0.0%	0	1700	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
Xylene (total)	0.0%	0	1200	0	13 U	13 U	12 U	12 U	12 U	13 U	12 U	13 U
Semivolatiles (ug/kg)												
Phenol	0.0%	0	30 or MDL	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
2-Methylphenol	0.0%	0	100 or MDL	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
4-Methylphenol	0.0%	0	900	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
2,4-Dimethylphenol	0.0%	0	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Benzoic Acid	NA	NA	2700	0	N	N	N	N	N	N	N	N
Naphthalene	0.0%	0	13,000	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
2-Methylnaphthalene	0.0%	0	36,400	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
2-Chloronaphthalene	0.0%	0	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
2-Nitroaniline	0.0%	0	430 or MDL	0	980 U	1000 U	990 U	980 U	970 U	1000 U	940 U	1000 U
Acenaphthylene	0.0%	0	41,000	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
2,6-Dinitrotoluene	0.0%	0	1000	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
3-Nitroaniline	0.0%	0	500 or MDL	0	980 U	1000 U	990 U	980 U	970 U	1000 U	940 U	1000 U
Acenaphthene	0.0%	0	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Dibenzofuran	0.0%	0	6200	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
2,4-Dinitrotoluene	0.0%	0	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Diethylphthalate	0.0%	0	7100	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Fluorene	0.0%	0	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
N-Nitrosodiphenylamine	8.0%	110	50,000*	0	62 J	110 J	410 U	400 U	400 U	420 U	390 U	420 U
Hexachlorobenzene	0.0%	0	410	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Pentachlorophenol	0.0%	0	1000 or MDL	0	980 U	1000 U	990 U	980 U	970 U	1000 U	940 U	1000 U
Phenanthrene	0.0%	0	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Anthracene	0.0%	0	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Carbazole	0.0%	0	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Di-n-butylphthalate	36.0%	460	8100	0	340 J	460	410 U	400 U	400 U	420 U	390 U	83 J
Fluoranthene	12.0%	21	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	21 J
Pyrene	20.0%	17	50,000*	0	13 J	410 U	15 J	400 U	400 U	420 U	390 U	16 J
Butylbenzylphthalate	0.0%	0	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Benzo(a)anthracene	0.0%	0	220 or MDL	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Chrysene	0.0%	0	400	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
bis(2-Ethylhexyl)phthalate	16.0%	460	50,000*	0	400 U	410 U	150 J	400 U	400 U	420 U	390 U	420 U
Di-n-octylphthalate	0.0%	0	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Benzo(b)fluoranthene	0.0%	[illegible]	1100	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Benzo(k)fluoranthene	0.0%	[illegible]	1100	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Benzo(a)pyrene	0.0%	0	61 or MDL	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Indeno(1,2,3-cd)pyrene	0.0%	0	3200	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Dibenz(a,h)anthracene	0.0%	0	14 or MDL	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U
Benzo(g,h,i)perylene	0.0%	0	50,000*	0	400 U	410 U	410 U	400 U	400 U	420 U	390 U	420 U

TABLE 2-11

SUMMARY OF COMPOUNDS DETECTED
LOW HILL SOILS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	TAGM (a)	NUMBER OF SAMPLES ABOVE TAGM	OB 2.0 03/09/93 LH-31	OB 2.0 03/09/93 LH-32	OB 2.0 03/09/93 LH-33	OB 2.0 03/09/93 LH-35	OB 2.0 03/09/93 LH-35D	OB 2.0 03/09/93 LH-36	OB 2.0 03/09/93 LH-37	OB 2.0 03/09/93 LH-40
Pesticides/PCBs (ug/kg)												
beta-BHC	0.0%	0	200	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.2 U	2 U	2.2 U
delta-BHC	8.3%	1.2	300	0	0.95 J	1.2 J	2.1 U	2.1 U	2.1 U	2.2 U	2 U	2.2 U
gamma-BHC (Lindane)	0.0%	0	60	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.2 U	2 U	2.2 U
Heptachlor	0.0%	0	100	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.2 U	2 U	2.2 U
Aldrin	0.0%	0	41	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.2 U	2 U	2.2 U
Heptachlor epoxide	0.0%	0	20	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.2 U	2 U	2.2 U
Endosulfan I	0.0%	0	900	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.2 U	2 U	2.2 U
Dieldrin	4.2%	5.8	44	0	4.1 U	4 U	4.1 U	5.8 J	4 U	4.2 U	3.9 U	4.2 U
4,4'-DDE	12.5%	6.4	2100	0	4.1 U	4 U	4.1 U	4.1 U	4 U	4.2 U	2.4 J	6.4
Endrin	0.0%	0	100	0	4.1 U	4 U	4.1 U	4.1 U	4 U	4.2 U	3.9 U	4.2 U
Endosulfan II	0.0%	0	900	0	4.1 U	4 U	4.1 U	4.1 U	4 U	4.2 U	3.9 U	4.2 U
4,4'-DDD	0.0%	0	2900	0	4.1 U	4 U	4.1 U	4.1 U	4 U	4.2 U	3.9 U	4.2 U
Endosulfan sulfate	0.0%	0	1000	0	4.1 U	4 U	4.1 U	4.1 U	4 U	4.2 U	3.9 U	4.2 U
4,4'-DDT	12.5%	5	2100	0	4.1 U	2.2 J	4.1 U	4.1 U	4 U	4.2 U	3.9 U	5
Endrin aldehyde	0.0%	0		NA	4.1 U	4 U	4.1 U	4.1 U	4 U	4.2 U	3.9 U	4.2 U
alpha-Chlordane	0.0%	0	540	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.2 U	2 U	2.2 U
Aroclor-1254	0.0%	0	1000	0	41 U	40 U	41 U	41 U	40 U	42 U	39 U	42 U
Aroclor-1260	0.0%	0	1000	0	41 U	40 U	41 U	41 U	40 U	42 U	39 U	42 U
Explosives (ug/kg)												
HMX	4.2%	68		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
RDX	16.7%	140		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
1,3,5-Trinitrobenzene	4.2%	66		NA	66 J	120 U	120 U	120 U	120 U	120 U	120 U	120 U
1,3-Dinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Tetryl	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4,6-Trinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
4-amino-4,6-Dinitrotoluene	0.0%	0		NA	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,6-Dinitrotoluene	0.0%	0	1000	0	120 U	120 U	120 U	120 U	120 U	120 U	120 U	120 U
2,4-Dinitrotoluene	4.2%	520		NA	520	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Metals (mg/kg)												
Aluminum	100.0%	20000.00	17503.0	7	15400	17900	16500	15100	15100	16700	14300	16000
Antimony	12.5%	8.20	5	3	6 UJ	8.2 J	6.6 UJ	6.3 UJ	6.5 UJ	6.6 UJ	7.1 J	6.3 UJ
Arsenic	100.0%	6.90	7.5	0	5.5	5.7	5.5	4.3	4.6	5	4.8	5
Barium	100.0%	656.00	300	2	374	656	297	118	114	163	140	151
Beryllium	100.0%	1.10	1	2	0.83	0.87	0.77	0.72	0.75	0.76	0.63	0.77
Cadmium	54.2%	2.70	1.8	1	2.7	1.4	0.54 J	0.36 U	0.37 U	0.38 U	0.35 U	0.36 U
Calcium	100.0%	6780.00	46825.0	0	3670	5290	3540	1720	1620	2100	2500	3020
Chromium	100.0%	28.40	26.6	3	23.4	27.1	23.3	19.1	19.3	20.3	17.1	21.1
Cobalt	100.0%	13.80	30	0	13.7	15.5	10.6	8.6	8.5	8.4	7	10.5
Copper	100.0%	427.00	25	19	239	427	375	46.4	49.8	71.1	72.4	60.3
Iron	100.0%	30100.00	32698.0	0	27600	29700	26400	23500	23100	23000	22400	26700
Lead	100.0%	1530.00	30	24	1530	1250	533	106 J	90.9 J	372	115 J	112 J
Magnesium	100.0%	5750.00	9071.1	0	4580	5750	4470	3310	3290	3490	3070	3600
Manganese	100.0%	1280.00	1065.8	1	933	900	561	516	483	559	396	625
Mercury	50.0%	0.14	0.1	2	0.1 J	0.08 J	0.14 J	0.06 J	0.06 J	0.09 J	0.07 J	0.11 J
Nickel	100.0%	32.70	41.3	0	31.7	36.8	27.2	19.9	19.8	19.9	16.9	21.7
Potassium	100.0%	2140.00	1529.6	7	1240	1490	1310	925	878	1450	1010	1330
Selenium	58.3%	1.10	2	0	0.18 J	0.21 UJ	0.25 UJ	0.19 UJ	0.26 UJ	0.27 UJ	0.23 J	0.23 UJ
Silver	12.5%	0.80	0.6	2	0.36 U	0.35 U	0.39 U	0.37 U	0.38 U	0.39 U	0.36 U	0.37 U
Sodium	87.5%	67.70	76	0	49.1 J	67.7 J	61.1 J	48.2 J	50.8 J	51.1 J	49.5 J	51.1 J
Thallium	0.0%	0.00	0.3	0	0.41 U	0.5 U	0.6 U	0.46 U	0.61 U	0.65 U	0.44 U	0.55 U
Vanadium	100.0%	33.40	150	0	25.7	27.8	26.6	25.2	25.5	27.4	24.4	26.6
Zinc	100.0%	443.00	89.1	14	245	443	194 J	66.2 J	64.7 J	74.4 J	92.4 J	78 J
Cyanide	0.0%	0	NA	NA	0.75 U	0.75 U	0.73 U	0.74 U	0.7 U	0.78 U	0.71 U	0.76 U

NOTES:
a) * = As per proposed TAGM, Total VOCs <10 ppm, Total Semi-VOCs <500 ppm, Individual Semi-VOCs <50 ppm.
For certain metals, the TAGM is equal to the greater value between the proposed TAGM and site background.
The number of samples above the TAGM was determined by comparison to the actual number given, not the MDL.
b) The TAGM for 1,2-Dichloroethene (trans) was used for 1,2-Dichloroethene (total) since it was the only value available.
c) NA = not applicable
d) N = Compound was not analyzed.
e) U = Compound was not detected.
f) J = The reported value is an estimated concentration.
g) R = The data was rejected in the data validation process.
h) SB = Site background
i) MDL = Method detection limit

TABLE 2-12

SUMMARY OF COMPOUNDS DETECTED
SEDIMENTS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NYSDEC SEDIMENT CRITERIA FOR AQUATIC LIFE (a)	NUMBER OF SAMPLES ABOVE NYSDEC SEDIMENT CRITERIA	SW-120 12/10/91	SW-120 12/10/91	SW-120 11/07/91	SW-130 11/07/91	SW-140 11/08/91	SW-150 11/15/91	SW-150 11/08/91	SW-150 11/08/91	SW-160 11/12/91	SW-170 11/12/91	SW-180 11/08/91	SW-180 12/12/91
VOCs (ug/kg)																
Acetone	5.9%	34	-	NA	10 J	N	19 U	19 U	23 U	17 U	21 U	20 U	16 U	18 U	13 U	25 U
Carbon Disulfide	5.9%	6	-	NA	6 U	N	9 U	9 U	11 U	9 U	10 U	10 U	8 U	9 U	7 U	10 U
Chloroform	17.6%	20	-	NA	2 J	N	9 U	9 U	11 U	9 J	20 J	9 J	2 J	9 U	3 J	10 U
Trichloroethene	2.9%	18	-	NA	6 U	N	9 U	9 U	11 U	9 U	10 U	10 U	8 U	9 U	7 U	10 U
Semivolatiles (ug/kg)																
4-Methylphenol	9.4%	350	6 (b)	3	350 J	350 J	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	N
Naphthalene	6.3%	24	-	NA	800 U	800 U	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	N
2-Methylnaphthalene	3.1%	12	-	NA	800 U	800 U	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	N
2,6-Dinitrotoluene	3.1%	120	-	NA	800 U	800 U	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	N
2,4-Dinitrotoluene	12.5%	1600	-	NA	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
N-Nitrosodiphenylamine (1)	12.5%	120	-	NA	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
Phenanthrene	15.6%	76	1390	0	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
Anthracene	3.1%	77	-	NA	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
Carbazole	6.7%	27	-	NA	N	N	N	N	N	N	N	N	N	N	N	N
Di-n-butylphthalate	18.8%	730	1197(c)	0	250 J	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
Fluoranthene	9.4%	140	-	NA	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
Pyrene	12.5%	110	-	NA	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
Benzo(a)anthracene	3.1%	48	-	NA	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
Chrysene	6.3%	62	-	NA	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
bis(2-Ethylhexyl)phthalate	46.9%	96	1197(c)	0	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
Benzo(b)fluoranthene	3.1%	52	-	NA	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
benzo(k)fluoranthene	3.1%	54	-	NA	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
Benzo(a)pyrene	3.1%	38	-	NA	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
Indeno(1,2,3-cd)pyrene	3.1%	37	-	NA	800 U	N	810 U	3100 U	790 U	980 U	N	N	1000 U	1000 U	900 U	960 U
Pesticides/PCBs (ug/kg)																
4,4'-DDE	9.4%	10	500	0	39 U	N	39 U	38 U	38 U	43 U	N	N	49 U	49 U	44 U	47 U
4,4'-DDT	6.3%	13	500	0	39 U	N	39 U	38 U	38 U	43 U	N	N	49 U	49 U	44 U	47 U
Explosives (ug/kg)																
HMX	6.5%	130	-	NA	1000 U	N	120 U	1000 U	120 U	1000 U	N	N	1000 U	1000 U	120 U	1000 U
RDX	3.2%	500	-	NA	120 U	N	120 U	120 U	120 U	120 U	N	N	120 U	120 U	120 U	120 U
2,4,6-Trinitrotoluene	3.2%	100	-	NA	120 U	N	120 U	120 U	120 U	120 U	N	N	120 U	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	3.2%	160	-	NA	120 U	N	120 U	120 U	120 U	120 U	N	N	120 U	120 U	120 U	120 U
2-amino-4,6-Dinitrotoluene	6.5%	180	-	NA	120 U	N	120 U	120 U	120 U	120 U	N	N	120 U	120 U	120 U	120 U
2,4-Dinitrotoluene	9.7%	98	-	NA	120 U	N	120 U	120 U	120 U	120 U	N	N	120 U	120 U	120 U	120 U
Metals (mg/kg)																
Aluminum	93.8%	25800	-	NA	10700 J	N	10600	6450 U	15600	N	11900 U	13700	17300	19000	25800	17500 J
Antimony	6.3%	28.3	-	NA	6.4 U J	N	8 U R	7.5 U R	7 U R	N	8.8 U R	13.7 U R	10.7 U R	15 U R	10.4 U R	8.3 J
Arsenic	75.0%	9.5	5	11	7.4 J	N	3.9	5 U	3.9 R	N	3.4 U R	3.7	4.8	7.1	5.1	2.5 J
Barium	78.1%	1780	-	NA	53.9 J	N	39.3	23.6 J	55.3 R	N	35.6	47	158	245	385	149 J
Beryllium	68.8%	1.6	-	NA	0.68 R	N	0.64	0.45 U	0.81 R	N	0.67 U R	0.94	1	1.1 J	1.2	0.9 R
Cadmium	71.9%	9.7	2.5	10	2.3 J	N	2.7 J	1.8 U	3.4 J	N	2.7 U J	2.4 J	4.1	4.2	3.3 J	2 J
Calcium	100.0%	104000	-	NA	24200 J	N	27700	31100	28900	N	28200	17800	9500	12100	2420	2020 J
Chromium	75.0%	41.8	26	6	21.5 J	N	20.2	14.4 U	28.1 R	N	21.7 U R	26.5	27.1	28.5	35.5	24.3 J
Cobalt	75.0%	17.8	-	NA	10.2 J	N	8	6.5 U	11 R	N	10 U R	10.8	14.6	11 J	11.6 R	10.9 J
Copper	93.8%	3790	19	30	49.7 J	N	25.3 J	18.7 U	31.6 J	N	31.4 U J	32.6 J	88 J	158 J	105 J	84.5 J
Iron	100.0%	40900	24,000	28	24400 J	N	27500	24200	38500	N	28300	32800	32900	31300	37100	24100 J
Lead	96.9%	7400	27	23	311 J	N	28.3	21 U	20.3	N	49.9 J	24.6	66	131	274	36.5 J
Magnesium	100.0%	12000	-	NA	6030 J	N	5660	3720	7930	N	6260	7020	6260	6270	7010	4690 J
Manganese	100.0%	1520	428	15	339 J	N	540	346 J	596	N	373 J	367	1520 J	362 J	468	383 J
Mercury	68.8%	2	0.11	10	0.69 J	N	0.12	0.04 U	0.04 R	N	0.15 U	0.07	1.1	0.91	0.13	0.09 J
Nickel	75.0%	64.4	22	24	35.7 J	N	33.5	22.1 U	44 R	N	39.9 U R	43	43	45.3	41.6	29.8 J
Potassium	100.0%	3530	-	NA	1010 J	N	1030	574 J	1510	N	1120 J	1750	2000	2660	3340	1460 J
Selenium	43.8%	1.8	-	NA	0.22 U J	N	0.22	0.37 U J	0.16 U R	N	0.23 U R	0.29	3 U J	0.4 U J	0.22 U R	0.13 U J
Silver	15.6%	1.9	-	NA	1 U J	N	1.2 U R	1.2 U	1 U R	N	1.3 U R	2 U R	1.7 U	2.4 U	1.6 U R	1.2 U J
Sodium	59.4%	191	-	NA	63.9 J	N	64.5 J	70.4	96 J	N	67.8 J	105 U	97.9 J	107 J	79.8 U	43.9 U J
Vanadium	75.0%	37.9	-	NA	17.1 J	N	17.3	10.4 U	23.4 R	N	19.7	23.4	24	30.8	39.8	26.3 J
Zinc	81.3%	1200	85	19	122 J	N	90.3	39.6 U	108 R	N	60.2 U R	87.1	233	272	131	107 J
Cyanide	6.3%	0.77	-	NA	0.66 U J	N	0.72 U	0.62	0.66 U	N	0.77	0.79 U	0.91 U	0.88 U	0.77 U	0.81 U J

NOTES: a) NYSDEC Sediment Criteria - 1989. (NYSDEC Sediment Criteria was update in November 1993, copper was established at 16 mg/kg and lead was established at 31 mg/kg)
b) NYSDEC 1989 guidelines for total phenols
c) Used NYSDEC 1989 guideline for phthalates (bis(2-Ethylhexyl) phthalate.
d) NA = not applicable
e) N = Compound was not analyzed.
f) U = Compound was not detected.
g) J = The reported value is an estimated concentration.
h) R = The data was rejected in the data validation process.

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TABLE 2-12

SUMMARY OF COMPOUNDS DETECTED
SEDIMENTS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NYSDEC SEDIMENT CRITERIA FOR AQUATIC LIFE (a)	NUMBER OF SAMPLES ABOVE NYSDEC SEDIMENT CRITERIA	SW-190 11/06/91	SW-191 11/06/91	SW-192 11/13/91	SW-192 11/13/91	SW-193 11/13/91	SW-194 11/13/91	SW-195 11/13/91	SW-196 11/12/91	SW-197 11/15/91	SD-200 12/03/92	SD-200RE 12/03/92	SD-210 12/03/92
VOCs (ug/kg)																
Acetone	5.9%	34	-	NA	11 U	25 R	28 U	20 U	16 U	14 U	19 U	12 U	17 U	14 U	N	13 U
Carbon Disulfide	5.9%	6	-	NA	6 U	10 U	10 U	10 U	8 U	7 U	9 U	6 U	8 U	14 U	N	13 U
Chloroform	17.6%	20	-	NA	6 U	10 U	10 U	10 U	8 U	7 U	9 U	6 U	8 U	14 U	N	13 U
Trichloroethene	2.9%	18	-	NA	6 U	10 U	10 U	10 U	8 U	7 U	9 U	6 U	8 U	14 U	N	13 U
Semivolatiles (ug/kg)																
4-Methylphenol	9.4%	350	6 (b)	3	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	470 U	440 U
Naphthalene	6.3%	24	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	470 U	440 U
2-Methylnaphthalene	3.1%	12	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	470 U	440 U
2,6-Dinitrotoluene	3.1%	120	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	470 U	440 U
2,4-Dinitrotoluene	12.5%	1600	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	130 J	140 J	440 U
N-Nitrosodiphenylamine (1)	12.5%	120	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	87 J	80 J	440 U
Phenanthrene	15.6%	76	1390	0	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	76 J	440 U
Anthracene	3.1%	77	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	77 J	440 U
Carbazole	6.7%	27	-	NA	N	N	N	N	N	N	N	N	N	470 U	27 J	440 U
Di-n-butylphthalate	18.8%	730	1197(c)	0	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	730 J	460 J	210 J
Fluoranthene	9.4%	140	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	140 J	440 U
Pyrene	12.5%	110	-	NA	100 J	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	110 J	440 U
Benzo(a)anthracene	3.1%	48	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	48 J	440 U
Chrysene	6.3%	62	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	62 J	440 U
bis(2-Ethylhexyl)phthalate	46.9%	96	1197(c)	0	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	54 J	61 J	57 J
Benzo(b)fluoranthene	3.1%	52	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	52 J	440 U
benzo(k)fluoranthene	3.1%	54	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	54 J	440 U
Benzo(a)pyrene	3.1%	38	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	38 J	440 U
Indeno(1,2,3-cd)pyrene	3.1%	37	-	NA	740 U	2600 U	1700 U	N	960 U	1000 U	1200 U	780 U	1200 U	470 U	37 J	440 U
Pesticides/PCBs (ug/kg)																
4,4'-DDE	9.4%	10	500	0	36 U	130 U	80 U	N	46 U	51 U	59 U	38 U	57 U	2.8 J	N	2.8 J
4,4'-DDT	6.3%	13	500	0	36 U	130 U	80 U	N	46 U	51 U	59 U	38 U	57 U	4.7 U	N	13
Explosives (ug/kg)																
HMX	6.5%	130	-	NA	120 J	120 U	1000 U	N	1000 U	1000 U	1000 U	1000 U	1000 U	120 U	N	120 U
RDX	3.2%	500	-	NA	500	120 U	120 U	N	120 U	120 U	120 U	120 U	120 U	120 U	N	120 U
2,4,6-Trinitrotoluene	3.2%	100	-	NA	100 J	120 U	120 U	N	120 U	120 U	120 U	120 U	120 U	120 U	N	120 U
4-amino-2,6-Dinitrotoluene	3.2%	160	-	NA	160	120 U	120 U	N	120 U	120 U	120 U	120 U	120 U	120 U	N	120 U
2-amino-4,6-Dinitrotoluene	6.5%	180	-	NA	180	120 U	120 U	N	120 U	120 U	120 U	120 U	120 U	120 U	N	120 U
2,4-Dinitrotoluene	9.7%	98	-	NA	98 J	120 U	120 U	N	120 U	120 U	120 U	120 U	120 U	120 U	N	93 J
Metals (mg/kg)																
Aluminum	93.8%	25800	-	NA	18700	19100	22900	N	16000	15800	14000	8310	15400	18000	N	14300
Antimony	6.3%	28.3	-	NA	9.5 U R	37.3 U	21.2 U R	N	11.8 U R	12.9 U R	14.1 U R	10.3 U R	11.4 U R	28.3 J	N	8.8 UJ
Arsenic	75.0%	9.5	5	11	4.9 R	4.7	7.4	N	6	3.8	5.7	4.4	6.6	5.1	N	4.2
Barium	78.1%	1780	-	NA	183 R	701	313	N	106	196	170	44.1	106	1780	N	373
Beryllium	68.8%	1.6	-	NA	1 R	2.4 U R	1.6 J	N	0.97 J	0.98 J	1.1 J	0.71 J	1	0.93 J	N	0.8
Cadmium	71.9%	9.7	2.5	10	9.7 J	6.3 J	5	N	2.3	2.8	2.8	2	2	2.3	N	2.6
Calcium	100.0%	104000	-	NA	28700	11900	10100	N	5720	15100	3130	104000	2840	5640	N	12300
Chromium	75.0%	41.8	26	6	27.4 R	34.6	41.8	N	25.3	24.6	23.5	15.2	21.7	30.3	N	25.2
Cobalt	75.0%	17.8	-	NA	12.8 R	21.8 U R	17.7 J	N	16.1	11.3 J	9.5 J	7.5 J	11.3	14.3	N	13.6
Copper	93.8%	3790	19	30	416	259	217 J	N	21.2 J	82.4 J	69.4 J	22.4 J	24.4 J	3790	N	301
Iron	100.0%	40900	24,000	28	34300	31700	40900	N	33000	31100	23700	23900	28600	35800	N	31800
Lead	96.9%	7400	27	23	59.3	463	280	N	331.9	268	73.6	15.4	31.7	7400	N	829
Magnesium	100.0%	12000	-	NA	7860	8100	9900	N	5410	6500	4430	12000	4310	6700	N	5760
Manganese	100.0%	1520	428	15	659	586	439 J	N	555 J	532 J	322 J	468 J	338 J	530	N	598
Mercury	68.8%	2	0.11	10	2	0.29	0.18 J	N	0.04 U	0.54	0.1 J	0.17	0.06 U	0.14	N	0.08 J
Nickel	75.0%	64.4	22	24	39.1 R	56.8	64.4	N	40.8	38.2	31.6	23.3	30.2	42.2	N	43
Potassium	100.0%	3530	-	NA	2940	3350 J	3530	N	2210	1980	1920	938	1540	1990	N	1180
Selenium	43.8%	1.8	-	NA	0.12 U R	0.62	0.45 U J	N	0.4 U J	0.49 U J	0.57 U J	0.31 U J	0.35 U J	1.6 J	N	0.74 J
Silver	15.6%	1.9	-	NA	1.8 R	5.6	3.4 U	N	1.9 U	2.1 U	2.3 U	1.7 U	1.8 U	0.9 J	N	1.9
Sodium	59.4%	191	-	NA	73 U	285 U	123 U	N	68.5 U	74.5 U	81.7 U	194 U	65.8 U	159 J	N	59.3 J
Vanadium	75.0%	37.9	-	NA	30.3 R	38.1	37.9	N	24.6	22.6	21.9	10.9	27.2	28.7	N	23
Zinc	81.3%	1200	85	19	360	419	655	N	100	251	281	76	89	1200	N	386
Cyanide	6.3%	0.77	-	NA	0.67 U	2 U	1.3 U	N	0.81 U	0.82 U	1 U	0.71 U	0.98 U	0.51 U	N	0.59 U

NOTES: a) NYSDEC Sediment Criteria - 1989. (NYSDEC Sediment Criteria was update
b) NYSDEC 1989 guidelines for total phenols
c) Used NYSDEC 1989 guideline for phthalates (bis(2-Ethylhexyl) phthalate.
d) NA = not applicable
e) N = Compound was not analyzed.
f) U = Compound was not detected.
g) J = The reported value is an estimated concentration.
h) R = The data was rejected in the data validation process

TABLE 2-12

SUMMARY OF COMPOUNDS DETECTED
SEDIMENTS

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NYSDEC SEDIMENT CRITERIA FOR AQUATIC LIFE (a)	NUMBER OF SAMPLES ABOVE NYSDEC SEDIMENT CRITERIA	SD-220 12/03/92	SD-230 12/03/92	SD-240 12/04/92	SD-250 12/04/92	SD-260 12/07/92	SD-261 12/07/92	SD-261RE 12/07/92	SD-270 12/07/92	SD-280 12/07/92	SD-290 12/07/92	SD-300 12/08/92	SD-310 12/08/92	SD-320 12/08/
VOCs (ug/kg)																	
Acetone	5.9%	34	-	NA	14 U	13 U	34	13 U	13 U	13 U	N	14 U	13 U	14 U	13 U	11 U	22 U
Carbon Disulfide	5.9%	6	-	NA	14 U	13 U	2 J	6 J	13 U	13 U	N	14 U	13 U	14 U	13 U	11 U	13 U
Chloroform	17.6%	20	-	NA	14 U	13 U	13 U	13 U	13 U	13 U	N	14 U	13 U	14 U	13 U	11 U	13 U
Trichloroethene	2.9%	18	-	NA	14 U	18	13 U	13 U	13 U	13 U	N	14 U	13 U	14 U	13 U	11 U	13 U
Semivolatiles (ug/kg)																	
4-Methylphenol	9.4%	350	6 (b)	3	480 U	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	130 J
Naphthalene	6.3%	24	-	NA	480 U	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	18 J	24 J
2-Methylnaphthalene	3.1%	12	-	NA	480 U	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	12 J	400 U	450 U
2,6-Dinitrotoluene	3.1%	120	-	NA	120 J	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	450 U
2,4-Dinitrotoluene	12.5%	1600	-	NA	1600	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	42 J	400 U	450 U
N-Nitrosodiphenylamine (1)	12.5%	120	-	NA	120 J	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	100 J	400 U	450 U
Phenanthrene	15.6%	76	1390	0	26 J	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	19 J	20 J	36 J
Anthracene	3.1%	77	-	NA	480 U	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	450 U
Carbazole	6.7%	27	-	NA	480 U	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	450 U
Di-n-butylphthalate	18.8%	730	1197(c)	0	510	450 U	15 J	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	450 U
Fluoranthene	9.4%	140	-	NA	22 J	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	29 J
Pyrene	12.5%	110	-	NA	25 J	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	21 J
Benzo(a)anthracene	3.1%	48	-	NA	480 U	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	450 U
Chrysene	6.3%	62	-	NA	480 U	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	18 J
bis(2-Ethylhexyl)phthalate	46.9%	96	1197(c)	0	96 J	91 J	49 J	37 J	22 J	20 J	N	35 J	39 J	36 J	15 J	24 J	39 J
Benzo(b)fluoranthene	3.1%	52	-	NA	480 U	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	450 U
benzo(k)fluoranthene	3.1%	54	-	NA	480 U	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	450 U
Benzo(a)pyrene	3.1%	38	-	NA	480 U	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	450 U
Indeno(1,2,3-cd)pyrene	3.1%	37	-	NA	480 U	450 U	470 U	460 U	420 U	390 U	N	540 U	410 U	490 U	370 U	400 U	450 U
Pesticides/PCBs (ug/kg)																	
4,4'-DDE	9.4%	10	500	0	10	4.5 U	4.7 U	4.6 U	4.3 U	4.5 U	4.5 U	4.6 U	4.2 U	4.9 U	3.6 U	4 U	4.4 U
4,4'-DDT	6.3%	13	500	0	2.3 J	4.5 U	4.7 U	4.6 U	4.3 U	4.5 U	4.5 U	4.6 U	4.2 U	4.9 U	3.6 U	4 U	4.4 U
Explosives (ug/kg)																	
HMX	6.5%	130	-	NA	120 U	120 U	120 U	120 U	120 U	120 U	N	120 U	120 U	130	120 U	120 U	120 U
RDX	3.2%	500	-	NA	120 U	120 U	120 U	120 U	120 U	120 U	N	120 U	120 U	120 U	120 U	120 U	120 U
2,4,6-Trinitrotoluene	3.2%	100	-	NA	120 U	120 U	120 U	120 U	120 U	120 U	N	120 U	120 U	120 U	120 U	120 U	120 U
4-amino-2,6-Dinitrotoluene	3.2%	160	-	NA	120 U	120 U	120 U	120 U	120 U	120 U	N	120 U	120 U	120 U	120 U	120 U	120 U
2-amino-4,6-Dinitrotoluene	6.5%	180	-	NA	120 U	120 U	120 U	120 U	120 U	120 U	N	120 U	120 U	85 J	120 U	120 U	120 U
2,4-Dinitrotoluene	9.7%	98	-	NA	86 J	120 U	120 U	120 U	120 U	120 U	N	120 U	120 U	120 U	120 U	120 U	120 U
Metals (mg/kg)																	
Aluminum	93.8%	25800	-	NA	17500	16000	16300	12900	10800	10500	N	15900	15900	13100	13100	12300	7560
Antimony	6.3%	28.3	-	NA	10 UJ	12 UJ	8.2 UJ	10.8 UJ	10.7 UJ	9.9 UJ	N	13.7 UJ	7.1 UJ	9.7 UJ	8.1 UJ	7.6 UJ	7.6 UJ
Arsenic	75.0%	9.5	5	11	5	9.5	4	2.5	3.4	2.1	N	7.2	3.2	2.1 J	7.2	5.7	4.5
Barium	78.1%	1780	-	NA	637	156	120	138	92.7	91	N	142	96.5	98.5	94.8	39.5	28.1 J
Beryllium	68.8%	1.6	-	NA	1.5	1.1	0.82	0.51 J	0.86 J	0.5 J	N	1.1 J	0.6 J	1.1	0.48 J	0.67	0.28 J
Cadmium	71.9%	9.7	2.5	10	2.3	0.74 J	0.47 U	0.62 U	0.61 U	0.57 U	N	0.78 U	0.41 U	2	1.3	0.55 J	0.44 U
Calcium	100.0%	104000	-	NA	8690	4330	3030	5680	85500	83000	N	3500	34500	10500	18400	30300	14300
Chromium	75.0%	41.8	26	6	28.7	22.4	22.1	18.7	17.6	16.8	N	21.5	25.6	21	24.5	23.4	16.7
Cobalt	75.0%	17.8	-	NA	13.7	7.7 J	12.5	8.6 J	9.8 J	9.3	N	10.4 J	8.2	10.6	11.2	9.9	6.1 J
Copper	93.8%	3790	19	30	445	40.5	24.2	22.9	25.7	19.3	N	23.7	31	88.7	2380	35.2	23.2
Iron	100.0%	40900	24,000	28	36400	29600	28100	26000	23300	21600	N	29200	28600	24900	36600	33100	21300
Lead	96.9%	7400	27	23	1120	62.4	38.6	32.3	11	6.6	N	22.4	12.5	24.1	332	34.7	115
Magnesium	100.0%	12000	-	NA	6240	4700	4170	4110	10800	9830	N	4110	7280	4920	6720	7150	3930
Manganese	100.0%	1520	428	15	619	196	775	313	378	410	N	365	340	357	420	477	274
Mercury	68.8%	2	0.11	10	0.07 J	0.06 J	0.04 J	0.06 J	0.03 U	0.03 J	N	0.1 J	0.07 J	0.83	0.1 J	0.07 J	0.27
Nickel	75.0%	64.4	22	24	44.6	32	28.8	24.7	32.8	29.6	N	22.9	35.7	34.9	42.3	37.3	28.1
Potassium	100.0%	3530	-	NA	1840	1840	1220	1010	1040	1140	N	1500	1390	1370	1280	1070	533 J
Selenium	43.8%	1.8	-	NA	0.76 J	1.2 J	0.84 J	0.52 J	1.2 J	1.8 J	N	1.5 J	0.96 J	0.71 J	1.4 J	1.1 J	0.76 J
Silver	15.6%	1.9	-	NA	0.59 U	0.71 U	0.49 U	0.64 U	0.63 U	0.58 U	N	0.81 U	0.42 U	1.3 J	0.68 J	0.45 U	0.49 J
Sodium	59.4%	191	-	NA	81.7 J	93.9 J	70.7 J	59.6 U	191 J	189 J	N	75.6 U	105 J	85.5 J	112 J	112 J	70.2 J
Vanadium	75.0%	37.9	-	NA	28.2	27.7	26.7	22.2	17.2	16.1	N	31.2	23.2	19.9	20.1	18.3	11.8
Zinc	81.3%	1200	85	19	647	86.3	71.9	68.9	68.3	61	N	60.2	113	208	497	106	68.5
Cyanide	6.3%	0.77	-	NA	0.72 U	0.66 U	0.7 U	0.87 U	0.78 U	0.65 U	N	0.97 U	0.7 U	0.85 U	0.5 U	0.72 U	0.88 U

NOTES: a) NYSDEC Sediment Criteria - 1989. (NYSDEC Sediment Criteria was update
b) NYSDEC 1989 guidelines for total phenols
c) Used NYSDEC 1989 guideline for phthalates (bis(2-Ethylhexyl) phthalate.
d) NA = not applicable
e) N = Compound was not analyzed.
f) U = Compound was not detected.
g) J = The reported value is an estimated concentration
h) R = The data was rejected in the data validation process

TABLE 2-13

SUMMARY OF COMPOUNDS DETECTED
SURFACE WATER

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NYS STANDARDS (a)	NUMBER OF REEDER CRK. SAMPLES ABOVE NYS STANDARDS	NUMBER OF WETLAND SAMPLES ABOVE NYS STANDARDS	WATER SW-110 11/07/91 Reeder Creek	WATER SW-120 11/07/91 Reeder Creek	WATER SW-120 12/12/91 Reeder Creek	WATER SW-120 11/12/91 Reeder Creek	WATER SW-120 12/12/91 Reeder Creek	WATER SW-130 11/07/91 Reeder Creek	WATER SW-140 11/07/91 Reeder Creek
VOCs (ug/L)												
Methylene Chloride	3.3%	8	5	1	0	5 U	5 U	5 U	N	N	5 U	5 U
Acetone	6.7%	35	-	NA	NA	10 U	10 U	10	N	N	10 U	10 U
Carbon Disulfide	3.3%	3	-	NA	NA	5 U	5 U	5 U	N	N	5 U	5 U
1,2-Dichloroethane	3.3%	2	0.8	1	0	5 U	5 U	5 U	N	N	5 U	2 J
Trichloroethene	3.3%	17	3	0	1	5 U	5 U	5 U	N	N	5 U	5 U
Semivolatiles (ug/L)												
bis(2-Ethylhexyl)phthalate	3.2%	71	0.6	0	1	10 U	11 U	10 U	N	N	10 U	10 U
Explosives (ug/L)												
RDX	18.8%	9.4	-	NA	NA	0.12 U	0.67	0.12 U	N	N	0.12 U	0.12 U
Tetryl	3.1%	0.52	-	NA	NA	0.12 U	0.12 U	0.4 U	N	N	0.12 U	0.12 U
Metals (ug/L)												
Aluminum	33.3%	5220	NA	NA	NA	109 U	300	102 J	N	N	109 U	109 U
Arsenic	10.0%	4.4	190.0	0	0	2.8 U	2.8 U	2.9 U J	N	N	2.8 U	2.8 U
Barium	86.7%	523	NA	NA	NA	66.6 J	65.7 J	48.9 J	N	N	52.3 J	51.2 J
Beryllium	10.0%	1.4	NA	NA	NA	3.5 U	3.5 U	1.4 J	N	N	3.5 U	3.5 U
Calcium	100.0%	183000	NA	NA	NA	121000	114000	96000 J	N	N	100000	87100
Chromium	3.3%	8.6	3076.0	0	0	9.6 U	9.5 U	6.1 U J	N	N	9.5 U	9.6 U
Copper	33.3%	59.8	34.2	0	1	19.7 U	19.6 U	14.4 U J	N	N	19.6 U	19.7 U
Iron	73.3%	8550	300.0	3	11	98.4 J	670	142 J	N	N	236	314
Lead	56.7%	74.2	200.0	0	0	0.7 U	2.2 J	1.2 U J	N	N	0.7 U	0.7 U
Magnesium	100.0%	59900	NA	NA	NA	18700	17300	13700 J	N	N	14400	12800
Manganese	86.7%	1080	NA	NA	NA	14.6 J	121	43.7 J	N	N	34.5	68.4
Mercury	10.0%	0.17	0.2	0	0	0.08 U	0.08 U	0.08 U J	N	N	0.08 U	0.08 U
Nickel	3.3%	5.6	3135.0	0	0	35.2 U	34.9 U	15.8 U J	N	N	35 U	35.2 U
Potassium	56.7%	6050	NA	NA	NA	3800 J	3800 J	949 J	N	N	3070 J	3000 J
Selenium	50.0%	3.2	NA	NA	NA	1.7 U	1.7 U	1 U J	N	N	1.7 U	1.7 U
Sodium	93.3%	59100	NA	NA	NA	26500	24700	21900 J	N	N	24100	23100
Vanadium	20.0%	39.2	190.0	0	0	30.9 U	30.7 U	30.3 U J	N	N	30.7 U	30.9 U
Zinc	3.3%	13.4	573.0	0	0	13.6 U	15.1 R	14.1 R	N	N	13.5 U	13.6 U
Cyanide	6.7%	14.9	22.0	0	0	10 U	10 U	10 U J	N	N	10 U	10 U

NOTES: a) Water Quality Regulations for Surface Waters and Groundwaters,.
6 NYCRR Parts 700-705, September 1991, NYSDEC Division of Water;
Class D surface water criteria were used. Selected metals values are based on a hardness of 201.
b) NA = not applicable
c) N = Compound was not analyzed.
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TABLE 2-13

SUMMARY OF COMPOUNDS DETECTED
SURFACE WATER

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NYS STANDARDS (a)	NUMBER OF REEDER CRK. SAMPLES ABOVE NYS STANDARDS	NUMBER OF WETLAND SAMPLES ABOVE NYS STANDARDS	WATER SW-150 11/08/91 Reeder Creek	WATER SW-150 11/08/91 Reeder Creek	WATER SW-150 11/15/91 Reeder Creek	(Upstream) WATER SW-196 11/12/91 Reeder Creek	WATER SW-300 12/08/92 Reeder Creek	WATER SW-310 12/08/92 Reeder Creek	WATER SW-320 12/08/92 Reeder Creek
VOCs (ug/L)												
Methylene Chloride	3.3%	8	5	1	0	5 U	5 U	N	5 U	8 J	10 U	10 U
Acetone	6.7%	35	-	NA	NA	10 U	10 U	N	10 U	10 U	10 U	10 U
Carbon Disulfide	3.3%	3	-	NA	NA	5 U	5 U	N	5 U	10 U	10 U	10 U
1,2-Dichloroethane	3.3%	2	0.8	1	0	5 U	5 U	N	5 U	10 U	10 U	10 U
Trichloroethene	3.3%	17	3	0	1	5 U	5 U	N	5 U	10 U	10 U	10 U
Semivolatiles (ug/L)												
bis(2-Ethylhexyl)phthalate	3.2%	71	0.6	0	1	10 U	10 U	10 U	10 U	21 U	10 U	14 U
Explosives (ug/L)												
RDX	18.8%	9.4	-	NA	NA	0.12 U	0.12 U	0.12 U	0.12 U	0.21 U	0.15 U	0.14 U
Tetryl	3.1%	0.52	-	NA	NA	0.12 U	0.12 U	0.4 U	0.4 U	0.12 U	0.12 U	0.12 U
Metals (ug/L)												
Aluminum	33.3%	5220	NA	NA	NA	109 U	139 J	N	97.5 U J	126 R	62.6 U	130 R
Arsenic	10.0%	4.4	190.0	0	0	2.8 U	2.8 U	N	3.7 U J	1.2 U	1.2 U	1.2 U
Barium	86.7%	523	NA	NA	NA	59.5 J	53.2 J	N	52.2 U J	51.7 J	47.2 J	51.3 J
Beryllium	10.0%	1.4	NA	NA	NA	3.5 U	3.5 U	N	1.2 U J	0.3 U	0.3 U	0.3 U
Calcium	100.0%	183000	NA	NA	NA	85600	83800	N	65800 J	93800	93100	97800
Chromium	3.3%	8.6	3076.0	0	0	9.6 U	9.5 U	N	6.1 U J	2 U	2 U	2 U
Copper	33.3%	59.8	34.2	0	1	19.7 U	19.6 U	N	14.4 U J	1.9 U	1.9 U	1.9 U
Iron	73.3%	8550	300.0	3	11	737	737	N	75.3 J	276 R	170 R	326 R
Lead	56.7%	74.2	200.0	0	0	1 J	1.2 J	N	0.7 U J	0.9 U	0.9 U	0.89 U
Magnesium	100.0%	59900	NA	NA	NA	12900	12700	N	8980 J	15500	15500	16400
Manganese	86.7%	1080	NA	NA	NA	236	230	N	16.8 R	47	32	53
Mercury	10.0%	0.17	0.2	0	0	0.11 J	0.08 U	N	0.08 U J	0.06 U	0.06 U	0.06 U
Nickel	3.3%	5.6	3135.0	0	0	35.2 U	35 U	N	15.9 U J	3.5 U	3.5 U	3.5 U
Potassium	56.7%	6050	NA	NA	NA	3470 J	2800 J	N	2420 J	1890 R	1780 R	1300 R
Selenium	50.0%	3.2	NA	NA	NA	1.7 U	1.7 U	N	1.7 U J	1.2 J	1.6 J	1.4 J
Sodium	93.3%	59100	NA	NA	NA	22900 U	22500	N	59100 J	11900	10300	10600
Vanadium	20.0%	39.2	190.0	0	0	30.9 U	30.7 U	N	39.2 J	2.1 U	2.1 U	2.1 U
Zinc	3[illegible]	13.4	573.0	0	0	13.6 U	13.5 U	N	13.4 J	3 R	3 R	5.3 R
Cyanide	6.7%	14.9	22.0	0	0	10 U	10 U	N	10 J	14.9	10 U	10 U

NOTES: a) Water Quality Regulations for Surface Waters and Groundwaters,.
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TABLE 2-13

SUMMARY OF COMPOUNDS DETECTED
SURFACE WATER

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NYS STANDARDS (a)	NUMBER OF REEDER CRK. SAMPLES ABOVE NYS STANDARDS	NUMBER OF WETLAND SAMPLES ABOVE NYS STANDARDS	WATER SW-160 11/12/91 Wetland	WATER SW-160 DL 1114/91 Wetland	WATER SW-170 11/12/91 Wetland	WATER SW-180 12/12/91 Wetland	WATER SW-180 12/12/91 Wetland	WATER SW-191 11/08/91 Wetland	WATER SW-192 11/13/91 Wetland
VOCs (ug/L)												
Methylene Chloride	3.3%	8	5	1	0	5 U	N	5 U	5 U	N	5 U	5 U
Acetone	6.7%	35	-	NA	NA	10 U	N	12 U	35	N	10 U	14 U
Carbon Disulfide	3.3%	3	-	NA	NA	5 U	N	5 U	5 U	N	5 U	5 U
1,2-Dichloroethane	3.3%	2	0.8	1	0	5 U	N	5 U	5 U	N	5 U	5 U
Trichloroethene	3.3%	17	3	0	1	5 U	N	5 U	5 U	N	5 U	5 U
Semivolatiles (ug/L)												
bis(2-Ethylhexyl)phthalate	3.2%	71	0.6	0	1	10 U	N	10 U	10 U	N	10 U	71
Explosives (ug/L)												
RDX	18.8%	9.4	-	NA	NA	9.4 R	9.4	0.67	0.12 U	N	0.12 U	0.12 U
Tetryl	3.1%	0.52	-	NA	NA	0.4 U	2 U R	0.4 U	0.4 U	N	0.12 U	0.4 U
Metals (ug/L)												
Aluminum	33.3%	5220	NA	NA	NA	98.3 U J	N	98.3 U J	256 J	N	1430	74.8 R
Arsenic	10.0%	4.4	190.0	0	0	3.7 U J	N	3.7 U J	2.9 U J	N	2.8 U	3.7 U
Barium	86.7%	523	NA	NA	NA	68.5 R	N	109 R	83 J	N	196 J	111 J
Beryllium	10.0%	1.4	NA	NA	NA	1.2 U J	N	1.2 U J	1.2 U J	N	3.5 U	1.1 U
Calcium	100.0%	183000	NA	NA	NA	93300 J	N	78600 J	34000 J	N	183000	106000
Chromium	3.3%	8.6	3076.0	0	0	6.2 U J	N	6.2 U J	6.2 U J	N	9.5 U	6.2 U
Copper	33.3%	59.8	34.2	0	1	14.5 U J	N	14.5 U J	19.8 J	N	24 J	20.9 J
Iron	73.3%	8550	300.0	3	11	189 J	N	181 J	213 J	N	3190	152 R
Lead	56.7%	74.2	200.0	0	0	1.4 J	N	3.6 J	2.1 J	N	74.2	6.6
Magnesium	100.0%	59900	NA	NA	NA	9320 J	N	10400 J	10900 J	N	34700	16000
Manganese	86.7%	1080	NA	NA	NA	14.9 R	N	12.6 R	38.5 J	N	240	13.5 J
Mercury	10.0%	0.17	0.2	0	0	0.08 U J	N	0.08 U J	0.08 U J	N	0.08 U	0.08 U
Nickel	3.3%	5.6	3135.0	0	0	16 U J	N	16 U J	15.9 U J	N	35 U	14.8 U
Potassium	56.7%	6050	NA	NA	NA	1860 J	N	4590 J	5720 J	N	6050	2700 J
Selenium	50.0%	3.2	NA	NA	NA	1.7 U J	N	1.7 U J	1 U J	N	2 J	0.99 J
Sodium	93.3%	59100	NA	NA	NA	4170 J	N	4850 U J	618 J	N	13800	7720
Vanadium	20.0%	39.2	190.0	0	0	37.2 J	N	33 J	30.5 U J	N	30.7 U	11.2 J
Zinc	3.3%	13.4	573.0	0	0	13.5 U J	N	13.5 U J	13.4 U J	N	98 R	52.3 R
Cyanide	6.7%	14.9	22.0	0	0	10 U	N	10 U	10 U J	N	10 U	10 U

NOTES: a) Water Quality Regulations for Surface Waters and Groundwaters,.
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TABLE 2-13

SUMMARY OF COMPOUNDS DETECTED SURFACE WATER

SENECA ARMY DEPOT OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NYS STANDARDS (a)	NUMBER OF REEDER CRK. SAMPLES ABOVE NYS STANDARDS	NUMBER OF WETLAND SAMPLES ABOVE NYS STANDARDS	WATER SW-193 11/13/91 Wetland	WATER SW-194 11/13/91 Wetland	WATER SW-195 11/13/91 Wetland	WATER SW-197 11/13/91 Wetland	WATER SW-200 12/03/92 Wetland	WATER SW-210 12/03/92 Wetland	WATER SW-220 12/03/92 Wetland
VOCs (ug/L)												
Methylene Chloride	3.3%	8	5	1	0	5 U	5 U	5 U	5 U	10 U	10 U	10 U
Acetone	6.7%	35	-	NA	NA	14 U	13 U	11 U	16 U	10 U	10 U	10 U
Carbon Disulfide	3.3%	3	-	NA	NA	5 U	5 U	5 U	3 J	10 U	10 U	10 U
1,2-Dichloroethane	3.3%	2	0.8	1	0	5 U	5 U	5 U	5 U	10 U	10 U	10 U
Trichloroethene	3.3%	17	3	0	1	5 U	5 U	5 U	5 U	10 U	10 U	10 U
Semivolatiles (ug/L)												
bis(2-Ethylhexyl)phthalate	3.2%	71	0.6	0	1	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Explosives (ug/L)												
RDX	18.8%	9.4	-	NA	NA	1.3	4.6	0.44	0.12 U	0.24 U	0.26 U	0.17 U
Tetryl	3.1%	0.52	-	NA	NA	0.4 U	0.4 U	0.4 U	0.52	0.12 U	0.12 U	0.12 U
Metals (ug/L)												
Aluminum	33.3%	5220	NA	NA	NA	269 J	481	5220	1490	273 R	62.3 U	219 R
Arsenic	10.0%	4.4	190.0	0	0	4.4 J	3.9 J	3.9 J	3.7 U	1.2 U	1.2 U	1.2 U
Barium	86.7%	523	NA	NA	NA	43.5 R	69.8 J	98.7 J	35.5 J	523	148 J	182 J
Beryllium	10.0%	1.4	NA	NA	NA	1.2 J	1.1 U	1.3 J	1.1 U	0.3 U	0.3 U	0.3 U
Calcium	100.0%	183000	NA	NA	NA	66200 J	78000	42000	24800	53400	66700	123000
Chromium	3.3%	8.6	3076.0	0	0	6.2 U J	6.2 U	8.6 J	6.2 U	2 U	2 U	2 U
Copper	33.3%	59.8	34.2	0	1	14.4 U J	28.1	37.2	10.5 J	33.5	1.9 U	22.3 J
Iron	73.3%	8550	300.0	3	11	319 J	741	6730	2210	307 R	43.7 R	8550
Lead	56.7%	74.2	200.0	0	0	0.7 U J	8.3	37.9	3	28.8	0.9 U	19.5
Magnesium	100.0%	59900	NA	NA	NA	7290 J	7900	7340	4340 J	33600	11300	27500
Manganese	86.7%	1080	NA	NA	NA	31 R	29.9	297	247	25.5	3.7 J	608
Mercury	10.0%	0.17	0.2	0	0	0.08 U J	0.09 J	0.08 U	0.08 U	0.06 U	0.06 U	0.06 U
Nickel	3.3%	5.6	3135.0	0	0	15.9 U J	14.7 U	14.7 U	14.7 U	3.5 U	3.5 U	3.5 U
Potassium	56.7%	6050	NA	NA	NA	1840 J	2360 J	5960	5610	3580 R	1690 R	4040 R
Selenium	50.0%	3.2	NA	NA	NA	1.7 U J	1 U	1 U	1 U	1.4 J	1.3 J	2 J
Sodium	93.3%	59100	NA	NA	NA	7400 J	5250	6010	1830 J	6720	2660 J	12900
Vanadium	20.0%	39.2	190.0	0	0	30.4 U J	11 J	19.5 J	9.4 U	2.1 U	2.1 U	2.1 U
Zinc	3.3%	13.4	573.0	0	0	13.4 U J	26.6 R	154 R	39.3 R	29.5 R	4.5 R	65.8 R
Cyanide	6.7%	14.9	22.0	0	0	10 U	10 U	10 U	10 U	10 U	10 U	10 U

NOTES: a) Water Quality Regulations for Surface Waters and Groundwaters,.
6 NYCRR Parts 700-705, September 1991, NYSDEC Division of Water;
Class D surface water criteria were used. Selected metals values are based on a hardness of 201.
b) NA = not applicable
c) N = Compound was not analyzed.
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.

TABLE 2-13

SUMMARY OF COMPOUNDS DETECTED
SURFACE WATER

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NYS STANDARDS (a)	NUMBER OF REEDER CRK. SAMPLES ABOVE NYS STANDARDS	NUMBER OF WETLAND SAMPLES ABOVE NYS STANDARDS	WATER SW-230 12/03/92 Wetland	WATER SW-240 12/04/92 Wetland	WATER SW-250 12/04/92 Wetland	WATER SW-260 12/07/92 Wetland	WATER SW-261 12/07/92 Wetland	WATER SW-270 12/07/92 Wetland	WATER SW-290 12/07/92 Wetland
VOCs (ug/L)												
Methylene Chloride	3.3%	8	5	1	0	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	6.7%	35	-	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	3.3%	3	-	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	3.3%	2	0.8	1	0	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	3.3%	17	3	0	1	17	10 U	10 U	10 U	10 U	10 U	10 U
Semivolatiles (ug/L)												
bis(2-Ethylhexyl)phthalate	3.2%	71	0.6	0	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Explosives (ug/L)												
RDX	18.8%	9.4	-	NA	NA	0.19 U	0.22 U	0.18 U	0.21 U	0.2 U	0.19 U	0.24 U
Tetryl	3.1%	0.52	-	NA	NA	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Metals (ug/L)												
Aluminum	33.3%	5220	NA	NA	NA	62.3 U	62.1 U	188 R	553 R	665 R	62.4 U	2100
Arsenic	10.0%	4.4	190.0	0	0	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Barium	86.7%	523	NA	NA	NA	228	21.7 J	42.3 J	181 J	176 J	57.7 J	112 J
Beryllium	10.0%	1.4	NA	NA	NA	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Calcium	100.0%	183000	NA	NA	NA	151000	58000	117000	137000	134000	111000	138000
Chromium	3.3%	8.6	3076.0	0	0	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Copper	33.3%	59.8	34.2	0	1	7.8 J	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	59.8
Iron	73.3%	8550	300.0	3	11	130 R	82.5 R	652	751	1070	4730	2310
Lead	56.7%	74.2	200.0	0	0	2.4 J	0.89 U	0.9 U	1 J	1.5 J	0.89 U	10.8
Magnesium	100.0%	59900	NA	NA	NA	59900	10700	15200	37600	36500	28500	33800
Manganese	86.7%	1080	NA	NA	NA	19.9	32.6	291	28.4	39.6	1080	186
Mercury	10.0%	0.17	0.2	0	0	0.06 U	0.17 J	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Nickel	3.3%	5.6	3135.0	0	0	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	5.6 J
Potassium	56.7%	6050	NA	NA	NA	5050 R	894 R	988 R	1920 R	2280 R	499 R	2100 R
Selenium	50.0%	3.2	NA	NA	NA	3.2 J	1.1 J	1.5 J	2.4 J	2.5 J	2.1 J	2.7 J
Sodium	93.3%	59100	NA	NA	NA	34200	13100	2180 J	25700	24400	4240 J	7290
Vanadium	20.0%	39.2	190.0	0	0	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Zinc	3.3%	13.4	573.0	0	0	17.2 R	8.1 R	21.6 R	6.2 R	7.4 R	1.8 U	97.4 R
Cyanide	6.7%	14.9	22.0	0	0	10 U	10 U	10 U	10 U	10 U	10 U	10 U

NOTES: a) Water Quality Regulations for Surface Waters and Groundwaters,.
6 NYCRR Parts 700-705, September 1991, NYSDEC Division of Water;
Class D surface water criteria were used. Selected metals values are based on a hardness of 201.
b) NA = not applicable
c) N = Compound was not analyzed.
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.

TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	01/08/92 MW-5	01/08/92 MW-5 Filtered	03/01/93 MW-5	01/14/92 MW-6	01/14/92 MW-6 Filtered	03/02/93 MW-6	01/10/92 MW-7	01/10/92 MW-7 Filtered
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	9 J	N	5 U	10 U	N	5 U	10 U	N
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	10 U	N	10 U	11 U	N	10 U	11 U	N
Di-n-butylphthalate	7.7%	2	50	50	0	10 U	N	10 U	11 U	N	10 U	11 U	N
Di-n-octylphthalate	1.5%	0.9	50	50	NA	10 U	N	10 U	11 U	N	10 U	11 U	N
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	0.12 U	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	0.12 U	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	0 12 U	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	3540 J	24.5 U	2180	5490 J	24.5 U	3440	27500	24.4 U
Antimony	5.2%	65.7	3	6	NA	55.8 U	53.2 U	54 U	53.2 U	53.3 U	53.7 U	55.8 U	53 U
Arsenic	13.5%	15.8	50	50	0	3.5 U	3.5 U	1.7 U	3.5 U	3.5 U	1.7 U	3.5 U	3.5 U
Barium	83.3%	2230	1000	2000	1	71.3 J	44 R	69.4 J	108 J	68.6 J	94.1 J	253	43.6 R
Beryllium	5.2%	2.4	3	4	NA	1.2 U	1.1 U R	0.3 U	1 1 U	1.3 R	0.3 U	2.5	1.1 U R
Cadmium	5.2%	51.9	10	5	3	2.9 U	3 U	3.1 U	3 U	3 U	3.1 U	2.9 U	3 U
Calcium	100.0%	1780000	-	-	NA	95500	98100	106000	110000	91300	108000	122000	84900
Chromium	32.3%	408	50	100	NA	7.1	6.2 U R	3.9 R	9.2 J	6.2 U R	4.9 J	36.7	6.3 R
Cobalt	18.8%	208	5	-	NA	19.9 U	20.4 U	5 U	20.4 U	20.5 U	5 U	19.9 U	20.4 U
Copper	37.5%	525	200	1300	3	24.7 J	10.2 U	2.4 R	12 J	10.2 U	5.6 J	42.7	10.1 U
Iron	62.5%	469000	300	300	55	4960	7 U R	2420	7660 J	7 U R	4550	39600	6.9 U R
Lead	52.1%	275	250	15	20	1.4 J	1.2 U	1.1 J	3.4	1.2 U	2.3 J	37.3	1.2 U
Magnesium	100.0%	227000	35000	-	NA	20600	22000	26100	38300	29200	33600	28700	17600
Manganese	90.6%	6980	300	300	21	71.6 J	5.9 J	51.2	151	5.5 J	77.9	707 J	4.8 U
Mercury	5.2%	0.15	2	2	0	0.18	0.17 R	0.06 U	0.17	0.15 R	0.06 U	0.23	0.16 R
Nickel	44.8%	642	-	100	NA	15.9 U	14.7 U	4.3 J	17.8 J	14.8 U	8.5 J	59.9	14.7 U
Potassium	93.8%	25400	-	-	NA	1280 J	288 U	1170 J	2280 J	561 J	2130 J	5600	287 U
Selenium	45.8%	4.8	10	10	0	1 U	1.8 J	1.1 U	1.8 J	3 J	1.2 J	1 U	1 J
Silver	1.0%	5.7	50	50	0	9.1 U	3.4 U	3.2 U	6.2	3.4 U	3.2 U	9.1 U	3.4 U
Sodium	100.0%	134000	20000	-	NA	17300	18400	17400	15700	14000	9900	5190	5490
Vanadium	38.5%	324	-	-	NA	30.5 U	9.5 U	4.3 R	13 J	9.5 U	5.9 J	34.2 J	9.4 U
Zinc	38.5%	3260	300	5000	0	27.3	8.5 U	11.2 R	41.5	8.5 U	21.3 R	133	8.4 U
Cyanide	1.6%	32.5	100	200	NA	10 U J	N	10 U	10 U	N	10 U	10 U J	N

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5- , 1992.
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.
g) NY State Class GA Groundwater Regulations.

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TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	03/01/93 MW-7	01/15/92 MW-8	01/15/92 MW-8 Filtered	01/15/92 MW-8A	01/15/92 MW-8A Filtered	03/01/93 MW-8	01/09/92 MW-9	01/09/92 MW-9 Filtered
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	5 U	10 U	N	10 U	N	5 U	10 U	N
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	10 U	11 U	N	11 U	N	10 U	10 U	N
Di-n-butylphthalate	7.7%	2	50	50	0	10 U	11 U	N	11 U	N	10 U	10 U	N
Di-n-octylphthalate	1.5%	0.9	50	50	NA	10 U	11 U	N	11 U	N	10 U	10 U	N
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	0.12 U	0.12 U	N	0.12 U	N	0.12 U	0.12 U	N
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	0.12 U	0.12 U	N	0.12 U	N	0.12 U	0.12 U	N
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	0.12 U	0.12 U	N	0.12 U	N	0.12 U	0.12 U	N
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	1130	52800 J	97.9 U	82500 J	97.6 U	564	5880 J	24.5 U
Antimony	5.2%	65.7	3	6	NA	53.8 U	52.9 U	53.2 U	53 U	53 U	53.8 U	55.7 U	53.3 U
Arsenic	13.5%	15.8	50	50	0	1.7 U	11.3	3.5 U	15.8	3.5 U	1.7 U	3.5 U	3.5 U
Barium	83.3%	2230	1000	2000	1	58.3 J	827 J	14.8 J	1410 J	16.1 J	20.3 J	181 J	46.5 R
Beryllium	5.2%	2.4	3	4	NA	0.3 U	2.6	1.2 U	3.7	1.2 U	0.3 U	1.9	1.1 U R
Cadmium	5.2%	51.9	10	5	3	3.1 U	10.7	3 U	15.5	3 U	3.1 U	2.9 U	3 U
Calcium	100.0%	1780000	-	-	NA	74500	454000 J	355000	510000 J	331000	295000	169000	168000
Chromium	32.3%	408	50	100	NA	2.9 R	81 J	6.2 U	133 J	6.2 U	2 U	9.4	6.2 U R
Cobalt	18.8%	208	5	-	NA	5 U	65	19.9 U	83.1	19.9 U	5 U	19.9 U	20.5 U
Copper	37.5%	525	200	1300	3	1.9 U	53.1 J	14.4 U	87.7 J	14.4 U	1.9 U	14.4 U	10.2 U
Iron	62.5%	469000	300	300	55	1970	83100 J	17 U	137000 J	17 U	688	7640	7 U R
Lead	52.1%	275	250	15	20	2.3 J	86.3 J	1.2 U	147 J	1.2 U	0.89 U	4.6	1.2 U
Magnesium	100.0%	227000	35000	-	NA	17500	98200 J	74100	110000 J	66900	67700	40800	41000
Manganese	90.6%	6980	300	300	21	52.9	1780 J	10.3 J	2330 J	10.8 J	17.7	200 J	14.8 J
Mercury	5.2%	0.15	2	2	0	0.06 U	0.19	0.03 U	0.22	0.03 U	0.06 U	0.19	0.17 R
Nickel	44.8%	642	-	100	NA	3.5 U	148 J	15.9 U	232 J	15.9 U	7 J	16.7 J	14.8 U
Potassium	93.8%	25400	-	-	NA	455 J	12000	2850 J	14600	2500 J	1310 J	2570 J	1690 J
Selenium	45.8%	4.8	10	10	0	1.1 U	5 U	1 U	5 U	1 U	1.1 U	1 U	2 J
Silver	1.0%	5.7	50	50	0	3.2 U	6.5	9.1 U	5.9	9 U	3.2 U	9.1 U	3.4 U
Sodium	100.0%	134000	20000	-	NA	3650 J	18200	18900	17900	17700	17900	13000	14000
Vanadium	38.5%	324	-	-	NA	2.5 R	75.8	30.5 U	115	30.4 U	2.2 R	30.4 U	9.5 U
Zinc	38.5%	3260	300	5000	0	10.9 R	179 J	13.4 U	302 J	13.4 U	7.4 R	29.3	8.5 U
Cyanide	1.6%	32.5	100	200	NA	10 U	10 U	N	10 U	N	10 U	10 U J	N

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.
g) NY State Class GA Groundewater Regulations.

TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	01/10/92 MW-10	01/10/92 MW-10 Filtered	03/03/93 MW-10	01/15/92 MW-11	03/10/93 MW-11	01/15/92 MW-12	01/15/92 MW-12 Filtered	03/08/93 MW-12
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	10 U	N	5 U	10 U	5 U	10 U	N	5 U
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	11 U	N	10 U	11 U	10 U	11 U	N	10 U
Di-n-butylphthalate	7.7%	2	50	50	0	11 U	N	10 U	11 U	10 U	11 U	N	10 U
Di-n-octylphthalate	1.5%	0.9	50	50	NA	11 U	N	10 U	11 U	10 U	11 U	N	10 U
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	0.12 U	N	0.12 U	0.12 U	0.12 U	0.12 U	N	0.12 U
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	0.12 U	N	0.12 U	0.12 U	0.12 U	0.12 U	N	0.12 U
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	0.12 U	N	0.12 U	0.12 U	0.12 U	0.12 U	N	0.12 U
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	72200	24.5 U	7350	222 J	75.2 J	37400	97.5 U	574
Antimony	5.2%	65.7	3	6	NA	55.6 U	53.2 U	53.8 U	53.1 U	54 U	53 U	52.9 U	54 U
Arsenic	13.5%	15.8	50	50	0	3.5 U	3.5 U	1.7 U	3.5 U	1.7 U	3.5 J	3.5 U	1.7 U
Barium	83.3%	2230	1000	2000	1	638	53.1 R	86.1 J	124 J	92.4 J	361	107 J	105 J
Beryllium	5.2%	2.4	3	4	NA	4.3	1.1 U R	0.3 U	1.1 U	0.3 U	2.1	1.2 U	0.3 U
Cadmium	5.2%	51.9	10	5	3	7.1	3 U	3.1 U	3 U	3.1 U	6.3	3 U	3.1 U
Calcium	100.0%	1780000	-	-	NA	223000	172000	162000	198000	186000	97400	85600	95000
Chromium	32.3%	408	50	100	NA	96.7	6.2 U R	9.6 J	6.2 U	2.1 J	53.4	6.1 U	2 U
Cobalt	18.8%	208	5	-	NA	98.6	20.4 U	5.6 J	20.4 U	5 U	48.2 J	19.8 U	5 U
Copper	37.5%	525	200	1300	3	80.3	10.2 U	7 J	10.1 U	4 R	64.8	16.5 J	2.1 R
Iron	62.5%	469000	300	300	55	108000	7 U R	8830	486 J	151 R	55200 J	17 U	827
Lead	52.1%	275	250	15	20	57.9	1.2 U	4.9	1.2 U	0.9 U	46	1.2 U	0.97 J
Magnesium	100.0%	227000	35000	-	NA	36800	19300	20100	32400	30000	69100	51500	74400
Manganese	90.6%	6980	300	300	21	3970 J	15.7	160	23.8	73.1	1030	3.2 U	17.5
Mercury	5.2%	0.15	2	2	0	0.27	0.16 R	0.07 R	0.16	0.06 U	0.26	0.03 U	0.06 U
Nickel	44.8%	642	-	100	NA	139	14.7 U	12.9 J	14.7 U	4.5 J	90.3	15.9 U	3.5 U
Potassium	93.8%	25400	-	-	NA	11000	1330 J	2440 J	1470 J	935 J	11300	6160	6670
Selenium	45.8%	4.8	10	10	0	10 U	1 U	1.1 U	1 U	1.1 U	1 U	2.8 J	1.1 U
Silver	1.0%	5.7	50	50	0	9 U	3.4 U	3.2 U	7.4	3.2 U	8.1	9 U	3.2 U
Sodium	100.0%	134000	20000	-	NA	13700	13100	10000	33200	30700	23800	23200	18100
Vanadium	38.5%	324	-	-	NA	103	9.5 U	10.2 J	9.4 U	2.1 U	44.9 J	30.3 U	2.1 U
Zinc	38.5%	3260	300	5000	0	291	8.5 U	32.8	8.4 U	3.8 R	194	13.4 U	41.3
Cyanide	1.6%	32.5	100	200	NA	10 U J	N	10 U	10 U	14.5	10 U	N	10 U

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.
g) NY State Class GA Groundwater Regulations.

TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	01/09/92 MW-13	01/09/92 MW-13 Filtered	01/15/92 MW-14	01/15/92 MW-14 Filtered	01/15/92 MW-14A	01/15/92 MW-14A Filtered	03/10/93 MW-14	01/09/92 MW-15
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	10 U	N	10 U	N	10 U	N	5 U	10 U
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	10 U	N	10 U	N	11 U	N	10 U	11 U
Di-n-butylphthalate	7.7%	2	50	50	0	10 U	N	10 U	N	11 U	N	0.5 J	11 U
Di-n-octylphthalate	1.5%	0.9	50	50	NA	10 U	N	10 U	N	11 U	N	0.9 J	11 U
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	0.6	N	0.12 U	N	0.12 U	N	0.12 U	0.082 J
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	0.12 U	N	0.12 U	N	0.12 U	N	0.12 U	0.12 U
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	0.12 U	N	0.12 U	N	0.12 U	N	0.12 U	0.12 U
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	12200	24.4 U	29100 J	118 J	32000 J	97.5 U	5590 J	30700
Antimony	5.2%	65.7	3	6	NA	55.5 U	52.9 U	53.3 U	53.1 U	52.9 U	53 U	53.9 U	55.5 U
Arsenic	13.5%	15.8	50	50	0	3.5 U	3.5 U	6.2 J	3.5 U	4.9 J	3.5 U	1.7 U	6.2 J
Barium	83.3%	2230	1000	2000	1	160 J	68.2 J	801	51 J	768	51.8 J	93.2 J	481
Beryllium	5.2%	2.4	3	4	NA	2.2	1.1 U R	1.1 U	1.2 U	1.4	1.2 U	0.91 J	2.5
Cadmium	5.2%	51.9	10	5	3	2.9 U	3 U	5.8	3 U	5.7	3 U	3.1 U	3.4 J
Calcium	100.0%	1780000	-	-	NA	142000	140000	188000	167000	189000	175000	169000	293000
Chromium	32.3%	408	50	100	NA	13.8	6.1 U R	43.8	6.2 U	46.1	6.2 U	5.6 J	50
Cobalt	18.8%	208	5	-	NA	19.8 U	20.3 U	32.2 J	19.9 U	32.3 J	19.8 U	5 U	28.6 J
Copper	37.5%	525	200	1300	3	25.4	10.1 U	57.9	14.4 U	61.6	15.2 J	12.7 J	67.4
Iron	62.5%	469000	300	300	55	13700	6.9 U R	46300 J	17 U	50500 J	17 U	7380 J	49600
Lead	52.1%	275	250	15	20	32	1.2 U	60.1	1.2 U	63.5	1.2 U	85.6	123
Magnesium	100.0%	227000	35000	-	NA	27100	25000	43800 J	32700	44200 J	32800	36200	54900
Manganese	90.6%	6980	300	300	21	175 J	4.8 U	765	3.2 U	807	3.2 U	87.1	564 J
Mercury	5.2%	0.15	2	2	0	0.22	0.16 R	0.26	0.03 U	0.25	0.05 J	0.12 R	0.25
Nickel	44.8%	642	-	100	NA	22.4 J	14.7 U	67.5	15.9 U	85.5	15.9 U	9.1 J	71.8
Potassium	93.8%	25400	-	-	NA	3330 J	714 J	6170	697 J	7430	889 J	2930 J	7100
Selenium	45.8%	4.8	10	10	0	1 U	1.5 J	4.4 J	1 U	4.2 J	1 U	2.3 J	1.5 J
Silver	1.0%	5.7	50	50	0	9 U	3.4 U	6	9 U	4.9	9 U	3.2 U	9 U
Sodium	100.0%	134000	20000	-	NA	16000	16700	36100	40400	38400	40700	35900	31600
Vanadium	38.5%	324	-		NA	31.1 J	9.4 U	42.3 J	30.4 U	51.4	30.4 U	7.8 J	34.1 J
Zinc	38.5%	3260	300	5000	0	86.1	8.4 U	163	13.4 U	154	13.4 U	39.1	169
Cyanide	1.6%	32.5	100	200	NA	10 U J	N	10 U	N	10 U	N	10 U	10 U J

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.
g) NY State Class GA Groundwater Regulations.

TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	01/09/92 MW-15 Filtered	03/02/93 MW-15	01/14/92 MW-16	01/14/92 MW-16 Filtered	01/14/92 MW-16A	01/14/92 MW-16A Filtered	03/10/93 MW-16	01/17/92 MW-17
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	N	5 U	10 U	N	10 U	N	5 U	10 U
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	N	10 U	11 U	N	11 U	N	10 U	11 U
Di-n-butylphthalate	7.7%	2	50	50	0	N	10 U	11 U	N	11 U	N	10 U	11 U
Di-n-octylphthalate	1.5%	0.9	50	50	NA	N	10 U	11 U	N	11 U	N	10 U	11 U
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	N	0.12 U	0.12 U	N	0.12 U	N	0.12 U	0.12 U
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	N	0.12 U	0.12 U	N	0.12 U	N	0.12 U	0.12 U
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	N	0.12 U	0.12 U	N	0.12 U	N	0.12 U	0.12 U
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	24.4 U	4440	6170 J	24.5 U	5960 J	24.5 U	930 J	28200
Antimony	5.2%	65.7	3	6	NA	52.9 U	53.8 U	53 U	53.2 U	53.1 U	53.3 U	54 U	65.7
Arsenic	13.5%	15.8	50	50	0	3.5 U	1.7 U	3.5 U	3.5 U	3.5 U	3.5 U	1.7 U	3.5 U
Barium	83.3%	2230	1000	2000	1	39.7 R	145 J	86.9 J	33.9 R	87.5 J	32.4 R	34.4 J	355
Beryllium	5.2%	2.4	3	4	NA	1.1 U R	0.3 U	1.1 U	1.4 R	1.1 U	1.5 R	0.3 U	2.8
Cadmium	5.2%	51.9	10	5	3	3 U	3.1 U	3 U	3 U	3 U	3 U	3.1 U	3.6 J
Calcium	100.0%	1780000	-	-	NA	248000	241000	126000	129000	123000	122000	132000	126000
Chromium	32.3%	408	50	100	NA	7.7 R	5.9 J	7.9 J	6.2 U R	7.8 J	6.2 U R	3.2 J	40.7
Cobalt	18.8%	208	5	-	NA	20.3 U	5 U	20.3 U	20.4 U	20.4 U	20.5 U	5 U	37.2 J
Copper	37.5%	525	200	1300	3	10.1 U	10.8 J	10.1 U	10.2 U	10.1 U	10.2 U	2.7 J	66.9
Iron	62.5%	469000	300	300	55	6.9 U R	5880	7930 J	7 U R	8130 J	7 U R	1290 J	42200
Lead	52.1%	275	250	15	20	1.2 U	10.5	9.1	1.2 U	11.3	1.2 U	1.6 J	42.5
Magnesium	100.0%	227000	35000	-	NA	47900	48900	26900	23200	26900	22700	24900	25400
Manganese	90.6%	6980	300	300	21	19.9	66.2	146	9.5 J	146	8.3 J	31.1	2240
Mercury	5.2%	0.15	2	2	0	0.15 R	0.06 U	0.15	0.2 R	0.15	0.3 R	0.08 R	0.03 U
Nickel	44.8%	642	-	100	NA	14.7 U	10.3 J	14.7 U	14.8 U	19.7 J	14.8 U	4.8 J	109
Potassium	93.8%	25400	-	-	NA	1450 J	2060 J	2890 J	970 J	2530 J	883 J	1270 J	6360
Selenium	45.8%	4.8	10	10	0	1.7 J	1.1 U	4.8 J	4.2 J	4.6 J	4.8 J	1.4 J	0.99 U
Silver	1.0%	5.7	50	50	0	3.4 U	3.2 U	5.3	3.4 U	4.4	3.4 U	3.2 U	3.4 U
Sodium	100.0%	134000	20000	-	NA	30700	23700	9920	10400	9830	10500	4830 J	7840
Vanadium	38.5%	324	-	-	NA	9.4 U	6.9 J	10.7 J	9.5 U	11 J	9.5 U	3.1 J	37.3 J
Zinc	38.5%	3260	300	5000	0	10.3 J	38.3	41.4	8.5 U	39.8	8.5 U	14.3 R	154
Cyanide	1.6%	32.5	100	200	NA	N	10 U	10 U	N	10 U	N	10 U	10 U

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.
g) NY State Class GA Groundewater Regulations.

TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	01/17/92 MW-17 Filtered	03/09/93 MW-17	01/13/92 MW-18	01/13/92 MW-18 Filtered	01/13/92 MW-18A	01/13/92 MW-18A Filtered	03/09/93 MW-18	03/09/93 MW-18D
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	N	5 U	10 U	N	10 U	N	5 U	5 U
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	N	1 J	10 U	N	10 U	N	10 U	10 U
Di-n-butylphthalate	7.7%	2	50	50	0	N	10 U	10 U	N	10 U	N	2 J	10 U
Di-n-octylphthalate	1.5%	0.9	50	50	NA	N	10 U	10 U	N	10 U	N	10 U	10 U
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	N	0.12 U	0.12 U	N	0.12 U	N	0.12 U	0.12 U
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	N	0.12 U	0.12 U	N	0.12 U	N	0.12 U	0.12 U
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	N	0.12 U	0.12 U	N	0.12 U	N	0.12 U	0.12 U
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	97.3 U	5000	9100 J	24.4 U	8660 J	24.6 U	1400	1210
Antimony	5.2%	65.7	3	6	NA	52.9 U	54 U	56.8 J	52.9 U	55.8 U	61.3	53.9 U	53.7 U
Arsenic	13.5%	15.8	50	50	0	3.5 U	1.7 U	3.5 U	3.5 U	3.5 U	3.5 U	1.7 U	1.7 U
Barium	83.3%	2230	1000	2000	1	78 J	104 J	195 J	15.9 R	182 J	14.6 R	39.9 J	36.5 J
Beryllium	5.2%	2.4	3	4	NA	1.2 U	0.37 J	2	1.1 U R	2.1	1.1 U R	0.3 U	0.3 U
Cadmium	5.2%	51.9	10	5	3	3 U	3.1 U	2.9 U	3 U	2.9 U	3 U	3.1 U	3.1 U
Calcium	100.0%	1780000	-	-	NA	103000	79500	143000	131000	140000	130000	107000	113000
Chromium	32.3%	408	50	100	NA	6.1 U	7.9 J	11.8	6.1 U R	10.9	8 R	2 U	2 U
Cobalt	18.8%	208	5	-	NA	19.8 U	5 U	19.9 U	20.3 U	19.9 U	20.5 U	5 U	5 U
Copper	37.5%	525	200	1300	3	16.2 J	7.6 R	14.4 U	10.1 U	14.4 U	10.2 U	2.7 R	4.1 R
Iron	62.5%	469000	300	300	55	16.9 U	5640	13000 J	6.9 U R	11700 J	7 U R	1550	1110
Lead	52.1%	275	250	15	20	1.2 U	5.3	11.4	1.2 U	10.6	1.2 U	1.5 J	1 J
Magnesium	100.0%	227000	35000	-	NA	14900	13600	27000	24500	26500	24500	21200	22200
Manganese	90.6%	6980	300	300	21	3.2 U	198	289 J	110	271 J	108	155	148
Mercury	5.2%	0.15	2	2	0	0.04 J	0.06 U	0.16	0.16 R	0.16	0.17 R	0.06 U	0.06 U
Nickel	44.8%	642	-	100	NA	15.8 U	13.1 J	22.9 J	14.7 U	17.1 J	14.8 U	5.2 J	3.5 U
Potassium	93.8%	25400	-	-	NA	629 U	1410 J	4130 J	1470 J	3870 J	1670 J	753 J	702 J
Selenium	45.8%	4.8	10	10	0	1.3 J	1.1 U	1.5 J	1 U	2.9 J	1.6 J	1.2 J	1.1 U
Silver	1.0%	5.7	50	50	0	9 U	3.2 U	9 U	3.4 U	9.1 U	3.4 U	3.2 U	3.2 U
Sodium	100.0%	134000	20000	-	NA	6450	3720 J	28300	28100	28500	27500	19100	20200
Vanadium	38.5%	324	-	-	NA	30.3 U	8.9 J	30.4 U	9.4 U	30.5 U	9.5 U	2.6 J	2.1 U
Zinc	38.5%	3260	300	5000	0	13.4 U	53.1	45.5	8.4 U	46.6	10.5 J	19.6 R	21.1 R
Cyanide	1.6%	32.5	100	200	NA	N	10 U	10 U J	N	10 U J	N	10 U	10 U

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.
g) NY State Class GA Groundewater Regulations.

TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	01/16/92 MW 19	01/16/92 MW-19 Filtered	03/04/93 MW-19	01/08/92 MW-21	01/08/92 MW-21 Filtered	03/01/93 MW-21	01/13/92 MW-22	01/13/92 MW-22 Filtered
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	10 U	N	5 U	10 U	N	5 U	10 U	N
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	11 U	N	10 U	10 U	N	10 U	10 U	N
Di-n-butylphthalate	7.7%	2	50	50	0	11 U	N	10 U	10 U	N	10 U	10 U	N
Di-n-octylphthalate	1.5%	0.9	50	50	NA	11 U	N	10 U	10 U	N	10 U	10 U	N
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	0.12 U	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	0.12 U	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	0.12 U	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	243000	97.5 U	40200	1880 J	24.4 U	62.5 U	13100	24.4 U
Antimony	5.2%	65.7	3	6	NA	52.9 U	53 U	53.9 U	55.9 U	52.9 U	54 U	55.8 U	53 U
Arsenic	13.5%	15.8	50	50	0	4.1 J	3.5 U	8 J	3.5 U	3.5 U	1.7 U	3.5 U	3.5 U
Barium	83.3%	2230	1000	2000	1	2230	40.6 J	348	47.5 J	25.4 R	32.6 J	154 J	22.5 R
Beryllium	5.2%	2.4	3	4	NA	12.8	1.2 U	2.4 J	1.6	1.1 U R	0.3 U	2	1.1 U R
Cadmium	5.2%	51.9	10	5	3	51.9	3 U	3.1 U	2.9 U	3 U	3.1 U	2.9 U	3 U
Calcium	100.0%	1780000	-	-	NA	2E+06	183000	279000	94100	91900	92100	121000	106000
Chromium	32.3%	408	50	100	NA	408	6.1 U	58.9	6.2 U	6.4 R	2 U	18.7	6.2 U R
Cobalt	18.8%	208	5	-	NA	208	19.8 U	28 J	20 U	20.3 U	5 U	19.9 U	20.4 U
Copper	37.5%	525	200	1300	3	525	15.2 J	69.5	14.5 U	10.1 U	1.9 U	30	10.1 U
Iron	62.5%	469000	300	300	55	469000 J	17 U	58000	2720	6.9 U R	39.7 R	19100	7 U R
Lead	52.1%	275	250	15	20	141	1.2 U	35.7	1.8 J	1.2 U	0.9 U	14.1	1.2 U
Magnesium	100.0%	227000	35000	-	NA	227000	54500	80300	12200	12800	12900	18800	15400
Manganese	90.6%	6980	300	300	21	6980	105	949	232 J	196	10.1 J	239 J	29.6
Mercury	5.2%	0.15	2	2	0	0.49	0.03 U	0.15 J	0.15	0.15 R	0.06 U	0.17	0.17 R
Nickel	44.8%	642	-	100	NA	642	15.9 U	98	16 U	14.7 U	3.5 U	33.2 J	14.7 U
Potassium	93.8%	25400	-	-	NA	25400	4660 J	8450	3050 J	2530 J	1370 J	4250 J	541 J
Selenium	45.8%	4.8	10	10	0	10 U	1.1 J	1.1 U	1 U	1.2 J	1.2 J	4.4 J	3.6 J
Silver	1.0%	5.7	50	50	0	5.7	9 U	3.2 U	9.1 U	3.4 U	3.2 U	9.1 U	3.4 U
Sodium	100.0%	134000	20000	-	NA	107000	112000	80100	18400	17900	21500	4400 J	4330 J
Vanadium	38.5%	324	-	-	NA	324	30.3 U	57.5	30.6 U	9.4 U	2.1 U	30.5 U	9.4 U
Zinc	38.5%	3260	300	5000	0	3260	67.4	627	15.1	8.4 U	4 R	67.8	9.1 J
Cyanide	1.6%	32.5	100	200	NA	10 U	N	10 U	10 U J	N	10 U	10 U J	N

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.
g) NY State Class GA Groundwater Regulations.

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TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	03/09/93 MW-22	01/14/92 MW-23	01/14/92 MW-23 Filtered	03/08/93 MW-23	01/14/92 MW-23RE	01/15/92 MW-24	01/15/92 MW-24 Filtered	03/03/93 MW-24
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	5 U	10 U J	N	5 U	10 U J	10 U	N	5 U
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	10 U	11 U	N	10 U	N	11 U	N	10 U
Di-n-butylphthalate	7.7%	2	50	50	0	10 U	11 U	N	10 U	N	11 U	N	10 U
Di-n-octylphthalate	1.5%	0.9	50	50	NA	10 U	11 U	N	10 U	N	11 U	N	10 U
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	0.12 U	0.12 U	N	0.12 U	N	0.12 U	N	0.12 U
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	0.12 U	0.12 U	N	0.12 U	N	0.21	N	0.12 U
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	0.12 U	0.12 U	N	0.12 U	N	0.12 U	N	0.12 U
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	111 J	3350 J	24.5 U	98.2 J	N	23500	97.4 U	508
Antimony	5.2%	65.7	3	6	NA	54.1 U	53 U	53.2 U	53.9 U	N	53.1 U	52.9 U	53.9 U
Arsenic	13.5%	15.8	50	50	0	1.7 U	3.5 U	3.5 U	1.7 U	N	3.5 U	3.5 U	1.7 U
Barium	83.3%	2230	1000	2000	1	37.1 J	104 J	44.2 R	36.6 J	N	507	96.5 J	93.5 J
Beryllium	5.2%	2.4	3	4	NA	0.3 U	1.1 U	1.4 R	0.3 U	N	1.2	1.2 U	0.3 U
Cadmium	5.2%	51.9	10	5	3	3.1 U	3 U	3 U	3.1 U	N	6	3 U	3.1 U
Calcium	100.0%	1780000	-	-	NA	115000	126000	123000	154000	N	153000	156000	155000
Chromium	32.3%	408	50	100	NA	2 U	6.2 U	6.2 U R	2 U	N	39.3	6.1	2 U
Cobalt	18.8%	208	5	-	NA	5 U	20.3 U	20.4 U	5 U	N	27.6 J	19.8 U	5 U
Copper	37.5%	525	200	1300	3	2.3 R	10.1 U	10.2 U	1.9 U	N	257	14.4 U	2.8 J
Iron	62.5%	469000	300	300	55	150 R	4960 J	7 U R	555	N	38900 J	16.9 U	659
Lead	52.1%	275	250	15	20	0.9 U	5.2	1.2 U	0.89 U	N	275	1.2 U	2.5 J
Magnesium	100.0%	227000	35000	-	NA	16600	29000	25000	29500	N	57600	46300	56000
Manganese	90.6%	6980	300	300	21	28.6	141	79.9	80.7	N	472	3.2 U	8.8 J
Mercury	5.2%	0.15	2	2	0	0.06 U	0.16	0.16 R	0.06 U	N	0.31	0.04 J	0.06 U
Nickel	44.8%	642	-	100	NA	4.5 J	17.8 J	14.7 U	3.5 U	N	70.7	15.9 U	4.4 J
Potassium	93.8%	25400	-	-	NA	446 U	2500 J	1260 J	808 J	N	6840	3120 J	3660 J
Selenium	45.8%	4.8	10	10	0	1.1 U	1 U	1.3 J	1.1 U	N	2.9 J	3.5 J	1.4 J
Silver	1.0%	5.7	50	50	0	3.2 U	4.7	3.4 U	3.2 U	N	8.2	9 U	3.2 U
Sodium	100.0%	134000	20000	-	NA	4900 J	13900	134000	16100	N	39700	39900	39700
Vanadium	38.5%	324	-	-	NA	2.1 U	9.4 U	9.5 U	2.4 J	N	30.7 J	30.3 U	2.1 U
Zinc	38.5%	3260	300	5000	0	7.4 R	18.4	8.5 U	5.3 R	N	423	13.4 U	18.9 R
Cyanide	1.6%	32.5	100	200	NA	10 U	10 U	N	10 U	N	10 U	N	10 U

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.
g) NY State Class GA Groundewater Regulations.

TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	03/03/93 MW-24D	01/13/92 MW-25	01/13/92 MW-25 Filtered	03/03/93 MW-25	01/15/92 MW-27	01/15/92 MW-27 Filtered	03/08/93 MW-27	01/14/92 MW-28
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	5 U	10 U	N	5 U	10 U	N	5 U	10 U
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	10 U	11 U	N	10 U	11 U	N	10 U	10 U
Di-n-butylphthalate	7.7%	2	50	50	0	10 U	11 U	N	10 U	11 U	N	10 U	10 U
Di-n-octylphthalate	1.5%	0.9	50	50	NA	10 U	11 U	N	10 U	11 U	N	10 U	10 U
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	0.12 U	0.12 U	N	0.12 U	0.12 U	N	0.12 U	0.12 U
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	0.12 U	0.12 U	N	0.12 U	0.12 U	N	0.12 U	0.12 U
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	0.12 U	0.12 U	N	0.12 U	0.12 U	N	0.12 U	0.087 J
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	484	15200	24.5 U	622	68400	98.1 U	68.7 J	34700
Antimony	5.2%	65.7	3	6	NA	54 U	55.4 U	53.2 U	53.6 U	53.2 U	53.3 U	53.6 U	53.2 U
Arsenic	13.5%	15.8	50	50	0	1.7 U	3.5 U	3.5 U	1.7 U	11.5	3.5 U	1.7 U	4.2 J
Barium	83.3%	2230	1000	2000	1	90.5 J	206	36.5 R	56.7 J	734	75.5 J	80.8 J	411
Beryllium	5.2%	2.4	3	4	NA	0.3 U	2.2	1.1 U R	0.3 U	2.8	1.2 U	0.3 U	1.8
Cadmium	5.2%	51.9	10	5	3	3.1 U	2.9 U	3 U	3.1 U	14.1	3 U	3.1 U	6
Calcium	100.0%	1780000	-	-	NA	152000	130000	106000	86900	208000	97400	92400	172000
Chromium	32.3%	408	50	100	NA	2 U	18	6.2 U R	2 U	118	6.2 U	2 U	53.9
Cobalt	18.8%	208	5	-	NA	5 U	19.8 U	20.4 U	5 U	58.1	20 U	5 U	24.6 J
Copper	37.5%	525	200	1300	3	2.8 J	19.3 J	10.2 U	1.9 U	128	16.1 J	1.9 U	37.9
Iron	62.5%	469000	300	300	55	676	23000	7 U R	701	127000 J	17.1 U	82.4 R	50800 J
Lead	52.1%	275	250	15	20	2.8 J	18	1.2 U	0.9 U	118	1.2 U	0.89 U	34.9
Magnesium	100.0%	227000	35000	-	NA	54900	25000	18600	16400	93800	60700	70600	44600
Manganese	90.6%	6980	300	300	21	11.3 J	281 J	34.3	28.7	1470 J	93.7	84.3	700 J
Mercury	5.2%	0.15	2	2	0	0.06 U	0.19	0.15 R	0.06 U	0.24	0.03 U	0.06 U	0.18
Nickel	44.8%	642	-	100	NA	3.5 U	28.4 J	14.8 U	3.5 U	196	16 U	3.5 U	81.6
Potassium	93.8%	25400	-	-	NA	3560 J	4400 J	658 J	921 J	18100	8440	7420	10200
Selenium	45.8%	4.8	10	10	0	1.6 J	1.9 J	1 U	1.1 U	5 U	3.4 J	1.1 U	5 U
Silver	1.0%	5.7	50	50	0	3.2 U	9 U	3.4 U	3.2 U	5.2	9.1 U	3.2 U	6.8
Sodium	100.0%	134000	20000	-	NA	38800	3900 J	3760 J	2860 J	17900	18300	18300	15300
Vanadium	38.5%	324	-	-	NA	2.1 U	30.3 U	9.5 U	2.3 J	107	30.5 U	2.1 U	45.3 J
Zinc	38.5%	3260	300	5000	0	9.7 R	55.3	8.5 U	5.5 R	274	13.5 U	4.3 R	108
Cyanide	1.6%	32.5	100	200	NA	10 U	10 U J	N	10 U	10 U J	N	10 U	10 U J

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
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TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	01/14/92 MW-28 Filtered	03/02/93 MW-28	01/14/92 MW-29	01/14/92 MW-29 Filtered	03/02/93 MW-29	01/09/92 MW-30	01/09/92 MW-30 Filtered	03/10/93 MW-30
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	N	15	10 U	N	5 U	10 U	N	5 U
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	N	10 U	11 U	N	10 U	10 U	N	10 U
Di-n-butylphthalate	7.7%	2	50	50	0	N	10 U	11 U	N	10 U	10 U	N	10 U
Di-n-octylphthalate	1.5%	0.9	50	50	NA	N	10 U	11 U	N	10 U	10 U	N	10 U
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N	0.12 U
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N	0.12 U
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N	0.12 U
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	24.5 U	598	12600	24.4 U	529	1440 J	24.5 U	62.1 U
Antimony	5.2%	65.7	3	6	NA	53.3 U	54.1 U	53 U	52.9 U	53.6 U	58.3 J	53.1 U	53.7 U
Arsenic	13.5%	15.8	50	50	0	3.5 U	1.7 U	3.5 U	3.5 U	1.7 U	3.5 U	3.5 U	1.7 U
Barium	83.3%	2230	1000	2000	1	53.9 R	59.5 J	166 J	78.1 J	76.8 J	94.2 J	74.9 J	81.4 J
Beryllium	5.2%	2.4	3	4	NA	1.2 R	0.3 U	1.1 U	1.5	0.3 U	1.8	1.1 U R	0.3 U
Cadmium	5.2%	51.9	10	5	3	3 U	3.1 U	3 U	3 U	3.1 U	2.9 U	3 U	3.1 U
Calcium	100.0%	1780000	-	-	NA	116000	53900	137000	116000	108000	164000	159000	161000
Chromium	32.3%	408	50	100	NA	6.2 U R	2 U	18.5	6.1 U R	2 U	6.2 U	6.2 U R	2 U
Cobalt	18.8%	208	5	-	NA	20.4 U	5 U	20.3 U	20.3 U	5 U	19.9 U	20.4 U	5 U
Copper	37.5%	525	200	1300	3	10.2 U	1.9 U	27.2	10.1 U	1.9 U	14.4 U	10.1 U	1.9 U
Iron	62.5%	469000	300	300	55	7 U R	56.8 J	19400 J	6.9 U R	609	1870	7 U R	21.7 U
Lead	52.1%	275	250	15	20	1.2 U	0.9 U	9.2	1.2 U	0.9 U	1.3 J	1.2 U	0.89 U
Magnesium	100.0%	227000	35000	-	NA	24500	2040 J	39800	29700	29000	23800	24200	25200
Manganese	90.6%	6980	300	300	21	85.9	1.5 J	432 J	4.8 U	16.1	39.8	16.8	7.2 J
Mercury	5.2%	0.15	2	2	0	0.2 R	0.06 U	0.16	0.17	0.06 U	0.15	0.3	0.06 U
Nickel	44.8%	642	-	100	NA	14.8 U	3.5 U	35.3 J	14.7 U	3.5 U	15.9 U	14.7 U	3.5 U
Potassium	93.8%	25400	-	-	NA	2220 J	11000	3700 J	592 J	966 J	996 J	697 J	443 U
Selenium	45.8%	4.8	10	10	0	2 J	1.1 U	2 J	1.9 J	1.1 U	1.1 J	1.3 J	1.1 U
Silver	1.0%	5.7	50	50	0	5.7 J	3.2 U	6.1	3.4 U	3.2 U	9 U	3.4 U	3.2 U
Sodium	100.0%	134000	20000	-	NA	15000	56800	14900	14000	11200	17500	17800	17800
Vanadium	38.5%	324	-	-	NA	9.5 U	5.1 J	19.5 J	9.4 U	2.1 U	30.4 U	9.5 U	2.1 U
Zinc	38.5%	3260	300	5000	0	8.5 U	5.4 R	84.3	8.4 U	5.8 R	21.1	11.1 J	2.6 R
Cyanide	1.6%	32.5	100	200	NA	N	10 U	10 U J	N	10 U	10 U J	N	10 U

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
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g) NY State Class GA Groundewater Regulations.

TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	01/16/92 MW 31	01/16/92 MW-31 Filtered	03/04/93 MW-31	01/16/92 MW 32	01/16/92 MW-32 Filtered	03/11/93 MW-32	01/08/92 MW-34	01/08/92 MW-34 Filtered
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	10 U	N	5 U	10 U	N	5 U	10 U	N
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	11 U	N	10 U	11 U	N	10 U	10 U	N
Di-n-butylphthalate	7.7%	2	50	50	0	11 U	N	10 U	11 U	N	10 U	10 U	N
Di-n-octylphthalate	1.5%	0.9	50	50	NA	11 U	N	10 U	11 U	N	10 U	10 U	N
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	0.12 U	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	0.12 U	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	0.12 U	N	0.12 U	0.12 U	N	0.12 U	0.12 U	N
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	120000	97.4 U	1830	35200	97.9 U	884 J	131000	24.5 U
Antimony	5.2%	65.7	3	6	NA	53.3 U	52.9 U	54 U	54.4 J	53.2 U	54 U	55.8 U	53.2 U
Arsenic	13.5%	15.8	50	50	0	8.3 J	3.5 U	1.7 U	5.5 J	3.5 U	1.7 U	3.5 U	3.5 U
Barium	83.3%	2230	1000	2000	1	955	21.2 J	55.7 J	347	41.6 J	53.9 J	779	10.7 R
Beryllium	5.2%	2.4	3	4	NA	6.6	1.2 U	0.34 J	2.8	1.2 U	0.3 U	7.8	1.1 U R
Cadmium	5.2%	51.9	10	5	3	20	3 U	3.1 U	3.3	3 U	3.1 U	13.2	3 U
Calcium	100.0%	1780000	-	-	NA	407000	149000	130000	151000	95400	93400	538000	66900
Chromium	32.3%	408	50	100	NA	202	6.1 U	2.8 J	62.6	6.2 U	2.2 J	200	6.2 U R
Cobalt	18.8%	208	5	-	NA	78.8	19.8 U	5 U	20.5 U	19.9 U	5 U	152	20.4 U
Copper	37.5%	525	200	1300	3	176	14.4 U	1.9 U	43.1	14.4 U	3.7 R	233	10.2 U
Iron	62.5%	469000	300	300	55	176000 J	17 U	2010	52100 J	17 U	957 J	254000	7 U R
Lead	52.1%	275	250	15	20	159	1.2 U	1.2 J	41.6	1.2 U	1.5 J	62.4	1.2 U
Magnesium	100.0%	227000	35000	-	NA	95500	38900	34100	41000	23500	23000	76500	7510
Manganese	90.6%	6980	300	300	21	2400 J	77.7	33	734 J	153	38.4	5610 J	18
Mercury	5.2%	0.15	2	2	0	0.21	0.03 U	0.06 U	0.17	0.04 J	0.06 U	0.3	0.16 R
Nickel	44.8%	642	-	100	NA	282	15.9 U	9.3 J	83.3	15.9 U	3.5 U	362	14.7 U
Potassium	93.8%	25400	-	-	NA	22300	2520 J	1210 J	9900	2360 J	1360 J	16200	418 J
Selenium	45.8%	4.8	10	10	0	10 U	1.7 J	1.1 U	10 U	1 U	1.1 U	10 U	2.3 J
Silver	1.0%	5.7	50	50	0	3.4 U	9 U	3.2 U	3.4 U	9.1 U	3.2 U	9.1 U	3.4 U
Sodium	100.0%	134000	20000	-	NA	12500	10800	17100	9100	7960	7140	4750 J	3590 J
Vanadium	38.5%	324	-	-	NA	180	30.3 U	4.3 J	54	30.5 U	3.4 J	167	9.5 U
Zinc	38.5%	3260	300	5000	0	433	13.4 U	24.9 R	135	13.4 U	10.2 R	734	12.9 J
Cyanide	1.6%	32.5	100	200	NA	10 U J	N	10 U	10 U J	N	10 U	10 U J	N

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
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g) NY State Class GA Groundewater Regulations.

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TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	03/12/93 MW-34	01/08/92 MW-35	01/08/92 MW-35 Filtered	03/12/93 MW-35	03/12/93 MW-35D	03/11/93 MW-36	03/12/93 MW-38	03/04/93 MW-39
VOCs (ug/l)													
Acetone	3.0%	15	-	5	2	5 U	10 U	N	5 U	5 U	5 U	5 U	5 U
Semivolatiles (ug/l)													
Diethylphthalate	1.5%	1	50	50	NA	10 U	11 U	N	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	7.7%	2	50	50	0	2 J	11 U	N	0.7 J	2 J	10 U	10 U	10 U
Di-n-octylphthalate	1.5%	0.9	50	50	NA	10 U	11 U	N	10 U	10 U	10 U	10 U	10 U
Explosives (ug/l)													
RDX	3.1%	0.6	-	-	NA	0.12 U	0.12 U	N	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	0.12 U	0.12 U	N	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	0.12 U	0.12 U	N	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Metals (ug/l)													
Aluminum	66.7%	243000	-	50	NA	13000 J	7550 J	24.5 U	600 J	1100 J	103 J	246 J	473
Antimony	5.2%	65.7	3	6	NA	53.9 U	55 5 U	53.1 U	53.9 U	54.1 U	53.7 U	53.8 U	53.8 U
Arsenic	13.5%	15.8	50	50	0	3.3 J	3.5 U	3.5 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Barium	83.3%	2230	1000	2000	1	103 J	103 J	37.5 R	80.2 J	86.7 J	64.3 J	33.5 J	58.1 J
Beryllium	5.2%	2.4	3	4	NA	0.89 J	1.8	1.1 U R	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cadmium	5.2%	51.9	10	5	3	3.1 U	2.9 U	3 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U
Calcium	100.0%	1780000	-	-	NA	117000	94700	87800	88700	93200	84700	91100	113000
Chromium	32.3%	408	50	100	NA	21.5	15.3	6.2 U R	2 U	2.2 J	2 U	2 U	2 U
Cobalt	18.8%	208	5	-	NA	11.1 J	19.9 J	20.4 U	5 U	5 U	5 U	5 U	5 U
Copper	37.5%	525	200	1300	3	21.1 J	14.4 U	10.1 U	1.9 U	2.7 R	1.9 U	2.2 R	2.4 R
Iron	62.5%	469000	300	300	55	19700 J	10500	7 U R	501 J	1130 J	155 J	221 J	746
Lead	52.1%	275	250	15	20	7.2	3.3	1.2 U	0.91 J	1.1 J	0.89 U	0.9 U	0.9 U
Magnesium	100.0%	227000	35000	-	NA	15100	14600	12900	14200	15000	11500	11600	33800
Manganese	90.6%	6980	300	300	21	403	557 J	306	46.6	49.4	166	171	122
Mercury	5.2%	0.15	2	2	0	0.08 R	0.18	0.18 R	0.07 R	0.1 R	0.06 U	0.09 R	0.06 U
Nickel	44.8%	642	-	100	NA	30.1 J	15.9 U	14.7 U	3.5 U	3.5 U	3.5 U	3.5 U	4.6 J
Potassium	93.8%	25400	-	-	NA	3220 J	4180 J	2790 J	1290 J	1240 J	2240 J	2930 J	4800 J
Selenium	45.8%	4.8	10	10	0	1.1 U	1.1 J	1.2 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Silver	1.0%	5.7	50	50	0	3.2 U	9 U	3.4 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
Sodium	100.0%	134000	20000	-	NA	3560 J	44100	39600	7390	7880	6600	9870	33900
Vanadium	38.5%	324	-	-	NA	20.1 J	30.3 U	9.5 U	2.1 U	2.6 J	2.1 U	2.1 J	2.1 U
Zinc	38.5%	3260	300	5000	0	76	58.2	13.8 J	84.2	86.3	4.3 R	4.4 R	6.8 R
Cyanide	1.6%	32.5	100	200	NA	10 U	10 U J	N	10 U	10 U	10 U	10 U	10 U

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.
g) NY State Class GA Groundewater Regulations.

TABLE 2-14

MONITORING WELLS
SUMMARY OF COMPOUNDS DETECTED

SENECA ARMY DEPOT
OB GROUNDS

	FREQUENCY OF DETECTION	MAXIMUM DETECTED	NY AWQS (g)	NYDWQS (a)	NUMBER OF SAMPLES ABOVE TAGM	03/09/93 MW-40	03/10/93 MW-40	03/08/93 MW-40	03/10/93 MW-40	03/04/93 MW-40	03/03/93 MW-41
VOCs (ug/l)											
Acetone	3.0%	15	-	5	2	N	N	N	N	5 U	5 U
Semivolatiles (ug/l)											
Diethylphthalate	1.5%	1	50	50	NA	10 U	N	N	N	N	N
Di-n-butylphthalate	7.7%	2	50	50	0	10 U	N	N	N	N	N
Di-n-octylphthalate	1.5%	0.9	50	50	NA	10 U	N	N	N	N	N
Explosives (ug/l)											
RDX	3.1%	0.6	-	-	NA	N	0.12 U	N	N	N	N
2,4,6-Trinitrotoluene	1.5%	0.21	500	-	NA	N	0.12 U	N	N	N	N
2,6-Dinitrotoluene	1.5%	0.087	5	-	NA	N	0.12 U	N	N	N	N
Metals (ug/l)											
Aluminum	66.7%	243000	-	50	NA	N	N	647	N	N	N
Antimony	5.2%	65.7	3	6	NA	N	N	53.6 U	N	N	N
Arsenic	13.5%	15.8	50	50	0	N	N	1.7 U	N	N	N
Barium	83.3%	2230	1000	2000	1	N	N	53.3 J	N	N	N
Beryllium	5.2%	2.4	3	4	NA	N	N	0.3 U	N	N	N
Cadmium	5.2%	51.9	10	5	3	N	N	3.1 U	N	N	N
Calcium	100.0%	1780000	-	-	NA	N	N	129000	N	N	N
Chromium	32.3%	408	50	100	NA	N	N	2 U	N	N	N
Cobalt	18.8%	208	5	-	NA	N	N	5 U	N	N	N
Copper	37.5%	525	200	1300	3	N	N	1.9 U	N	N	N
Iron	62.5%	469000	300	300	55	N	N	653	N	N	N
Lead	52.1%	275	250	15	20	N	N	0.9 U	N	N	N
Magnesium	100.0%	227000	35000	-	NA	N	N	16100	N	N	N
Manganese	90.6%	6980	300	300	21	N	N	148	N	N	N
Mercury	5.2%	0.15	2	2	0	N	N	0.06 U	N	N	N
Nickel	44.8%	642	-	100	NA	N	N	4.7 J	N	N	N
Potassium	93.8%	25400	-	-	NA	N	N	442 U	N	N	N
Selenium	45.8%	4.8	10	10	0	N	N	1.1 U	N	N	N
Silver	1.0%	5.7	50	50	0	N	N	3.2 U	N	N	N
Sodium	100.0%	134000	20000	-	NA	N	N	6950	N	N	N
Vanadium	38.5%	324	-	-	NA	N	N	2.1 U	N	N	N
Zinc	38.5%	3260	300	5000	0	N	N	4.4 R	N	N	N
Cyanide	1.6%	32.5	100	200	NA	N	N	N	32.5	N	N

NOTES: a) NY State Drinking Water Regulations and 10NYCRR Part 5, Subpart 5-
b) N = Compound was not analyzed.
c) NA = not applicable
d) U = Compound was not detected.
e) J = The reported value is an estimated concentration.
f) R = The data was rejected in the data validation process.
g) NY State Class GA Groundewater Regulations.

SECTION 2
PROJECT IMPLEMENTATION PLAN

2.1 OBJECTIVES

This document presents and describes the technical requirements necessary for a service contract to design and implement the remediation of soils and sediments at SEAD 23, the OB Grounds. The design and implementation refers to the removal, storage, treatment and discharge of associated wastewaters as well as to the actual excavation, storage, treatment and disposal of soils. In addition the project also includes site clearance of unexploded ordnance and the installation of a soil cover over areas that have lead levels over 60 ppm. Site clearance of unexploded ordnance will be done under a separate contract by EODT. However the site remediation contractor will have to coordinate work activities closely with EODT and the COE site representative to assure that all the project objectives are fulfilled.

The objectives set for this remediation project include the following:

1. Remove all UXOs from the areas of the site that will undergo remediation.
2. Excavate and dispose at an off-site landfill, soils with concentrations of lead greater than 500 mg/kg.
3. Remove sediment from Reeder Creek in areas adjacent to the OB Grounds.
4. Conduct appropriate post-remediation groundwater monitoring to ensure continued protection of groundwater.
5. Prevent surface water runoff that may contain lead from the OB Grounds from entering the sediment in Reeder Creek.
6. Cover the areas of the OB grounds that have soils containing lead concentrations above 60 mg/kg with at least nine inches of clean fill.
7. Develop vegetative stabilization of the remaining soil at the OB grounds to minimize erosion.
8. Conduct periodic monitoring of the sediments in Reeder Creek to ensure sediment quality.

Objectives 2, 3, 5, 6 and 7 are the responsibility of the site remediation contractor. In addition, the remediation contractor will be responsible for installing any new wells required to fulfill Objective 4. The post-remediation monitoring of the groundwater will be the responsibility of the owner. The owner will also be responsible for the long term monitoring of the sediments in Reeder Creek as required to meet Objective 8. EODT will be responsible for the removal of UXO as required by project Objective 1 and the excavation of soils required by Objective 2..

Safe implementation of all activities is the primary goal of the effort. This is the primary responsibility of the UXO contractor(s), who will ensure compliance with all UXO safety requirements.

2.2 PROJECT ORGANIZATION

Figure 2-1 presents the project organization for this project. Two contractors will be involved in the project. The removal of ordnance and explosives (OE) along with the excavation of soils with lead over 500 mg/kg will be the responsibility of the UXO contractor. The treatment and disposal of soils along with installing the soil cover and Reeder Creek sediment removal will be the responsibility of the remediation contractor. These two contractors will have to coordinate all activities especially during excavation, backfilling and stockpiling of soils.

2.3 PROJECT SCHEDULE

Figure 2-3 presents the preliminary project schedule which includes a list of the tasks to be performed. The schedule is presented in three separate formats. Page 1 of the schedule shows the summary schedule with all the subtasks combined into the main tasks. Pages 2, 3, 4 and 5 of the schedule show the entire schedule including the subtasks.. Pages 6, 7 and 8 of the schedule lists the tasks along with the duration of each task, the start and finish date of each task and the name of the contractor responsible for the task. The tasks identified on the schedule are discussed in more detail in Section 3 of this document.

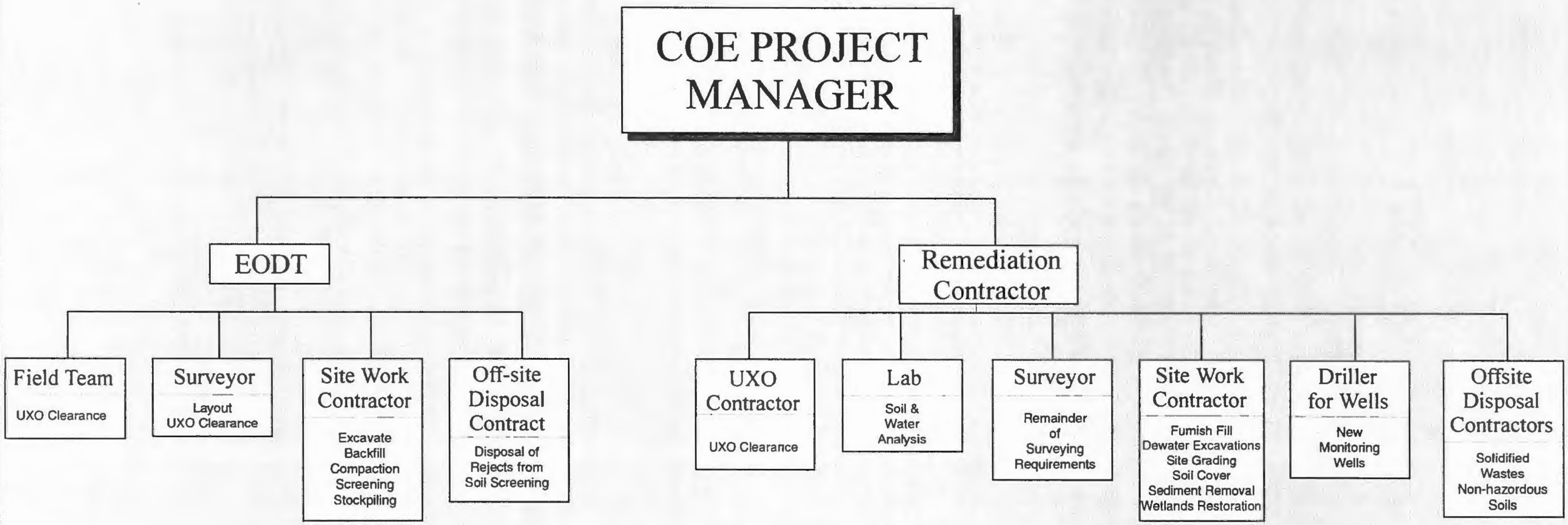
The critical path for this project starts with the preconstruction tasks. Work on the preconstruction tasks should begin as soon as possible.

The sequence in which the areas are to be excavated must follow the following guidelines. First, the soils that are shown as Case 1 soils (lead > 800 mg/kg) on Figures 6 - 13 shall be excavated and placed in the stockpile for the soils that will be solidified/stabilized. No sampling of these stockpiled soils will be required. Confirmatory sampling in the excavation will be required. Second, the soil classified as Case 2 soils (lead >500 mg/kg but < 800 mg/kg) shall be excavated, screened and placed into 200 cubic yard soil piles for testing (TCLP metals) - these soils will not be used for backfill, they will be disposed of at an off-site landfill. Solidification/stabilization of the soils may be required based on the results of the TCLP analysis. Third, the Case 3 soils (lead < 500 mg/kg) which will be screened for UXO clearance (such as the low lying hills, the remainder of berms and pads, etc.) should be excavated last. These soils will be screened and then placed in 200 cubic yard piles for testing (total lead). If testing confirms the soils are less than 500 mg/kg of lead, then the soil will be used as backfill in the excavations. However, if the concentration of lead is over 500 mg/kg than the soil will be tested for TCLP metals and disposed of according to the results of the TCLP analysis. Figure 2-2 presents a soil management logic flow chart which summarizes the required sequence described above. Note that this sequence shall apply to each area individually which means that if the work begins in an area that doesn't have any Case 1 or 2 soils identified in it that the work in that area would start at phase 3 as shown on the flow chart. While excavation at or near the burn pads must follow the flow chart starting at Phase I as shown on the flow chart.

The project schedule for the soil remediation portion of the project will have to be closely coordinated with EODT's proposed schedule for the UXO clearance portion of the project. There will be extensive exclusion zones used by EODT during the UXO clearance, limiting access to the OB Grounds. These exclusion zones have not been finalized yet but are expected to be up to 850 feet. The remediation contractor shall coordinate all his activities with the safety requirements of EODT to ensure that all these UXO safety restrictions are considered.

The schedule presented is based on completing the work prior to the fall planting season. A complete growing season is required to assure that the new cover will not be damaged by erosion before the ground cover is established. In order to meet this requirement many of the activities (sediment removal, soil treatment and disposal, wetland restoration) will have to be performed in parallel or delayed until the spring growing season.

The schedule identifies that soil treatment and disposal will be performed while EODT is performing the UXO clearance at the OB Grounds. This assumes that the soils will be stockpiled outside of the exclusion area. Locating the stockpile area outside of the exclusion zone may require double handling of the material (screening and testing of soils would still be done at the OB Grounds), however it would allow the treatment and disposal of the soils to start sooner. If the EODT work is halted for any reason then the solidification process may also have to be halted (if it runs out of material to process) until the EODT work begins again. If the stockpiles are located on the OB Grounds then the treatment and disposal of soils cannot begin until EODT is finished at the site. This may prove to be advantageous, this would allow EODT to complete their work this fall and would allow Westin to plan more carefully for a spring start without having to include so many contingencies based on potential changes or delays in the EODT work.



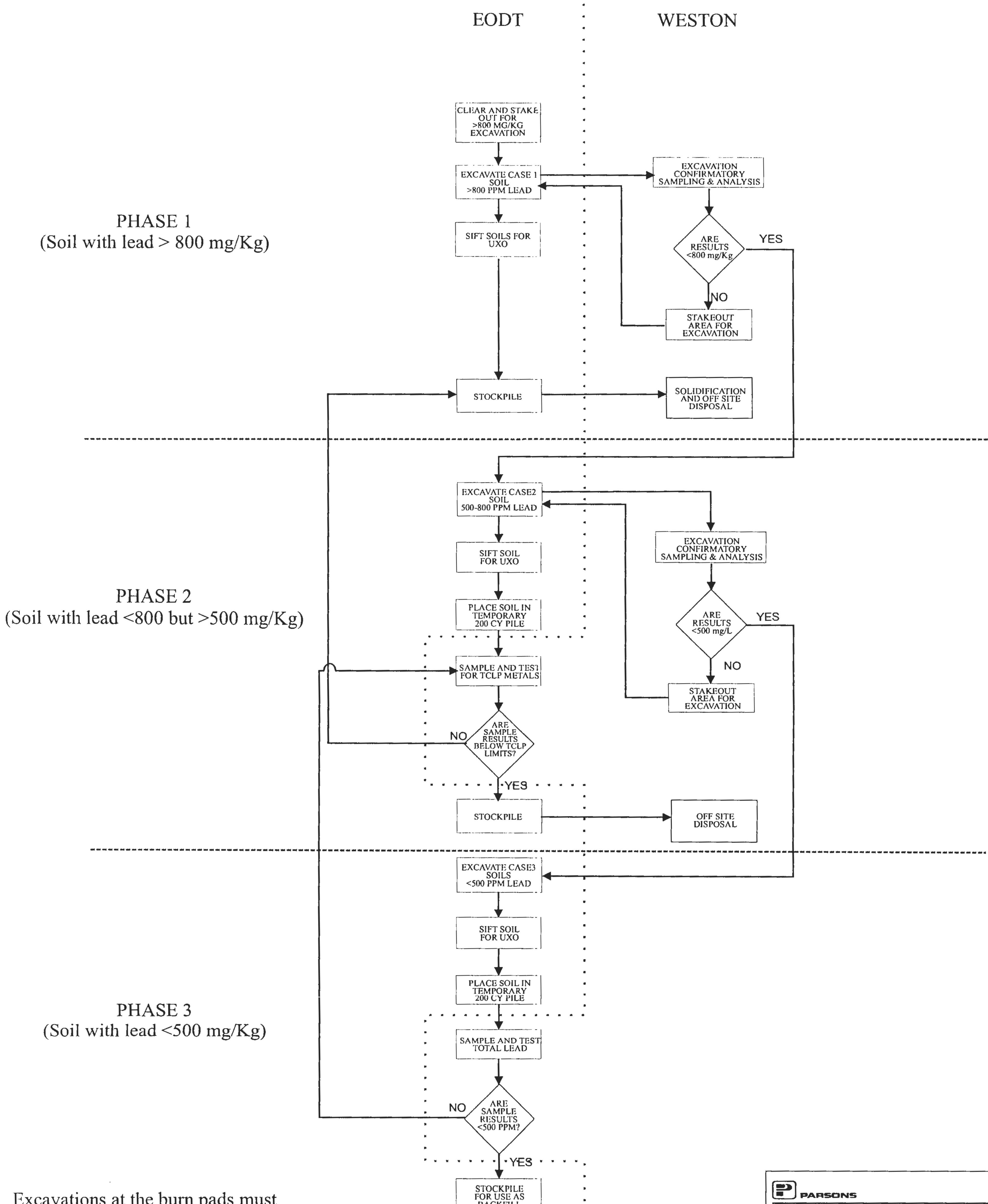
Project Organization Chart

Open Burning Grounds (OB) Remediation Project

Figure 2-1
SENECA ARMY DEPOT ACTIVITY

March 16, 1998

SENECA ARMY DEPOT ACTIVITY
OB Ground - Soil Remediation Project
Soil Excavation Flowchart



Excavations at the burn pads must start at Phase 1. Excavations away from the burn pads where no Case I or Case 2 soils have been identified may start at Phase 3.

PARSONS

PARSONS ENGINEERING SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
Section C - Remedial Action
Open Burning Grounds

DEPT. ENVIRONMENTAL ENGINEERING	DWG NO.

FIGURE 2-2

SOIL EXCAVATION FLOWCHART

SCALE N/A	DATE July 1998

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FIGURE 2-3
SENECA ARMY DEPOT
OB GROUNDS - REMEDIATION SCHEDULE

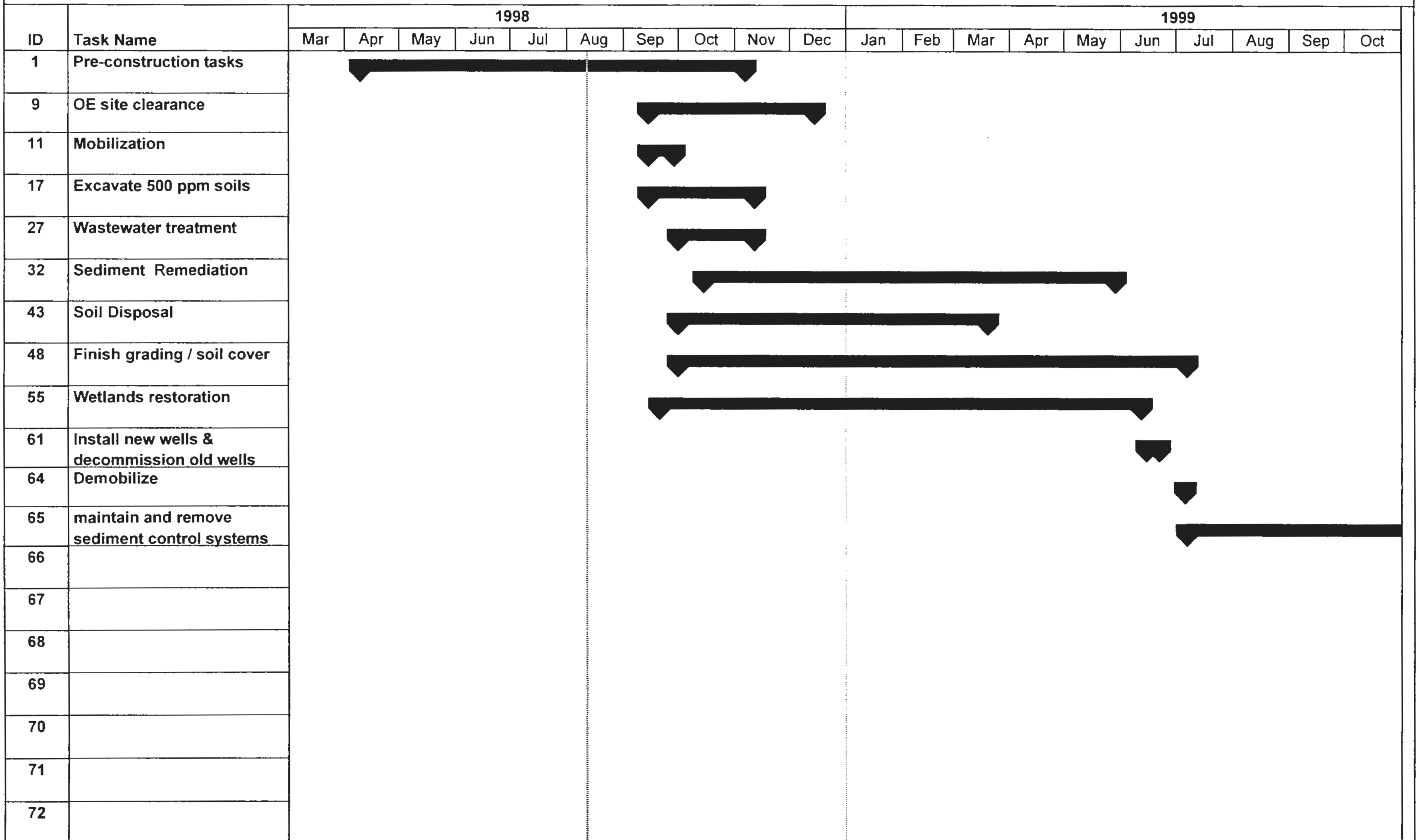

FIGURE 2-3
SENECA ARMY DEPOT
OB GROUNDS - REMEDIATION SCHEDULE

ID	Task Name
1	**Pre-construction tasks**
2	Wastwater permit
3	wetlands permit
4	solidification study
5	landfill documentation
6	TCLP & total lead tests
7	Locate onsite borrow pit
8	work plan submittals
9	**OE site clearance**
10	mag & flag site
11	**Mobilization**
12	trailers
13	temporary utilities
14	pile management area
15	decon facilities
16	wastewater treatment
17	**Excavate 500 ppm soils**
18	stake out areas
19	Excavate soil

FIGURE 2-3
SENECA ARMY DEPOT
OB GROUNDS - REMEDIATION SCHEDULE

ID	Task Name	1998–1999 (Mar 1998 – Oct 1999)
20	screen soil for OE	EODT
21	stockpile screened soil	EODT
22	sample excavation	REMEDIATION CONTRACTOR
23	layout additional areas	REMEDIATION CONTRACTOR
24	additional excavation (if Required)	EODT
25	furnish off site backfill (if required)	REMEDIATION CONTRACTOR
26	Backfill excavations	EODT
27	**Wastewater treatment**	
28	collect water from excavation	REMEDIATION CONTRACTOR
29	test wastewater	REMEDIATION CONTRACTOR
30	treat wastewater & retest	REMEDIATION CONTRACTOR
31	discharge wastewater	REMEDIATION CONTRACTOR
32	**Sediment Remediation**	
33	install stream diversion system	REMEDIATION CONTRACTOR
34	survey stream bed prior to sediment removal	REMEDIATION CONTRACTOR
35	excavate sediment	REMEDIATION CONTRACTOR
36	dewater sediment	REMEDIATION CONTRACTOR
37	wastewater treatment	REMEDIATION CONTRACTOR
38	stockpile sediment	REMEDIATION CONTRACTOR

FIGURE 2-3
SENECA ARMY DEPOT
OB GROUNDS - REMEDIATION SCHEDULE

ID	Task Name
39	survey stream bed after sediment removal
40	stabile stream banks
41	remove dewatering system
42	revegetate stream banks
43	**Soil Disposal**
44	sample piles
45	backfill soils w/ lead <500ppm
46	non-haz soil disposal
47	solidification/disposal of haz soils
48	**Finish grading / soil cover**
49	layout soil cover & sample soil 60 ppm lead
50	clear and grub
51	site grading
52	install 9" cover
53	seed and mulch
54	survey area covered
55	**Wetlands restoration**
56	layout new wet land
57	excavate material for fill

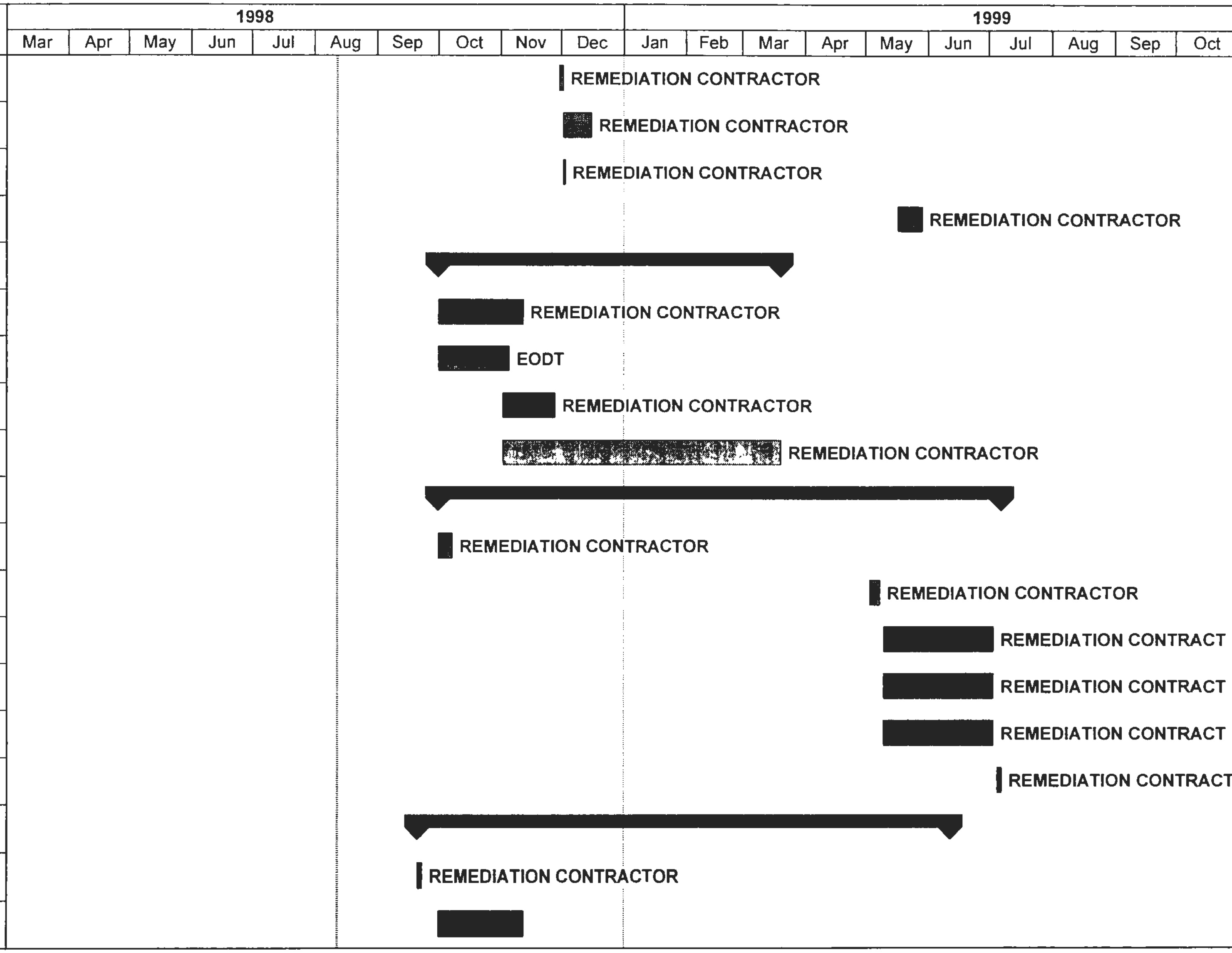

FIGURE 2-3
SENECA ARMY DEPOT
OB GROUNDS - REMEDIATION SCHEDULE

ID	Task Name	1998: Mar – Dec; 1999: Jan – Oct
58	grade new wetland	REMEDIATION CONTRACTOR
59	install organic fill	REMEDIATION CONTRACTOR
60	seed wetlands	REMEDIATION CONTRACTOR
61	**Install new wells & decommission old wells**	
62	install new wells	REMEDIATION CONTRACTOR
63	decommision old wells	REMEDIATION CONTRACTOR
64	**Demobilize**	
65	**maintain and remove sediment control systems**	
66		
67		
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75		
76		

FIGURE 2-3
SENECA ARMY DEPOT
OB GROUNDS - REMEDIATION SCHEDULE

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1	**Pre-construction tasks**	**151.13d**	**4/9/98**	**11/6/98**		
2	Wastwater permit	40d	8/17/98	10/9/98		REMEDIATION CONTRACTOR
3	wetlands permit	60d	8/17/98	11/6/98		REMEDIATION CONTRACTOR
4	solidification study	25d	8/17/98	9/18/98		REMEDIATION CONTRACTOR
5	landfill documentation	20d	9/21/98	10/16/98	4	REMEDIATION CONTRACTOR
6	TCLP & total lead tests	40d	4/9/98	6/4/98		Parsons
7	Locate onsite borrow pit	22d	8/17/98	9/15/98		REMEDIATION CONTRACTOR
8	work plan submittals	32d	8/7/98	9/21/98		REMEDIATION CONTRACTOR
9	**OE site clearance**	**65d**	**9/15/98**	**12/14/98**		
10	mag & flag site	65d	9/15/98	12/14/98		EODT
11	**Mobilization**	**10d**	**9/15/98**	**9/28/98**		
12	trailers	1d	9/15/98	9/15/98		REMEDIATION CONTRACTOR
13	temporary utilities	1d	9/15/98	9/15/98		REMEDIATION CONTRACTOR
14	pile management area	5d	9/15/98	9/21/98		EODT / REMEDIATION CONTRACTOR
15	decon facilities	5d	9/15/98	9/21/98		REMEDIATION CONTRACTOR
16	wastewater treatment	5d	9/22/98	9/28/98		REMEDIATION CONTRACTOR
17	**Excavate 500 ppm soils**	**42d**	**9/15/98**	**11/11/98**		
18	stake out areas	3d	9/15/98	9/17/98		REMEDIATION CONTRACTOR
19	Excavate soil	25d	10/1/98	11/4/98		EODT
20	screen soil for OE	25d	10/1/98	11/4/98		EODT
21	stockpile screened soil	25d	10/1/98	11/4/98		EODT
22	sample excavation	25d	10/1/98	11/4/98		REMEDIATION CONTRACTOR
23	layout additional areas	25d	10/1/98	11/4/98		REMEDIATION CONTRACTOR
24	additional excavation (if Required)	5d	11/5/98	11/11/98	23	EODT
25	furnish off site backfill (if required)	30d	10/1/98	11/11/98		REMEDIATION CONTRACTOR
26	Backfill excavations	30d	10/1/98	11/11/98		EODT
27	**Wastewater treatment**	**30d**	**10/1/98**	**11/11/98**		
28	collect water from excavation	30d	10/1/98	11/11/98		REMEDIATION CONTRACTOR

FIGURE 2-3
SENECA ARMY DEPOT
OB GROUNDS - REMEDIATION SCHEDULE

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
29	test wastewater	30d	10/1/98	11/11/98		REMEDIATION CONTRACTOR
30	treat wastewater & retest	30d	10/1/98	11/11/98		REMEDIATION CONTRACTOR
31	discharge wastewater	30d	10/1/98	11/11/98		REMEDIATION CONTRACTOR
32	**Sediment Remediation**	**162d**	**10/15/98**	**5/28/99**		
33	install stream diversion system	5d	10/15/98	10/21/98		REMEDIATION CONTRACTOR
34	survey stream bed prior to sediment removal	2d	10/22/98	10/23/98	33	REMEDIATION CONTRACTOR
35	excavate sediment	25d	10/26/98	11/27/98	34	REMEDIATION CONTRACTOR
36	dewater sediment	25d	10/26/98	11/27/98	34	REMEDIATION CONTRACTOR
37	wastewater treatment	25d	10/26/98	11/27/98	34	REMEDIATION CONTRACTOR
38	stockpile sediment	25d	10/26/98	11/27/98	34	REMEDIATION CONTRACTOR
39	survey stream bed after sediment removal	2d	11/30/98	12/1/98	35	REMEDIATION CONTRACTOR
40	stabile stream banks	10d	12/2/98	12/15/98	39	REMEDIATION CONTRACTOR
41	remove dewatering system	1d	12/2/98	12/2/98	39	REMEDIATION CONTRACTOR
42	revegetate stream banks	10d	5/17/99	5/28/99		REMEDIATION CONTRACTOR
43	**Soil Disposal**	**122d**	**10/1/98**	**3/19/99**		
44	sample piles	30d	10/1/98	11/11/98		REMEDIATION CONTRACTOR
45	backfill soils w/ lead <500ppm	25d	10/1/98	11/4/98		EODT
46	non-haz soil disposal	20d	11/2/98	11/27/98		REMEDIATION CONTRACTOR
47	solidification/disposal of haz soils	100d	11/2/98	3/19/99		REMEDIATION CONTRACTOR
48	**Finish grading / soil cover**	**199d**	**10/1/98**	**7/6/99**		
49	layout soil cover & sample soil 60 ppm lead	5d	10/1/98	10/7/98		REMEDIATION CONTRACTOR
50	clear and grub	5d	5/3/99	5/7/99		REMEDIATION CONTRACTOR
51	site grading	40d	5/10/99	7/2/99	50	REMEDIATION CONTRACTOR
52	install 9" cover	40d	5/10/99	7/2/99	50	REMEDIATION CONTRACTOR
53	seed and mulch	40d	5/10/99	7/2/99	50	REMEDIATION CONTRACTOR
54	survey area covered	2d	7/5/99	7/6/99	53	REMEDIATION CONTRACTOR
55	**Wetlands restoration**	**190d**	**9/21/98**	**6/11/99**		

FIGURE 2-3
SENECA ARMY DEPOT
OB GROUNDS - REMEDIATION SCHEDULE

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
56	layout new wet land	2d	9/21/98	9/22/98		REMEDIATION CONTRACTOR
57	excavate material for fill	30d	10/1/98	11/11/98		
58	grade new wetland	5d	5/17/99	5/21/99		REMEDIATION CONTRACTOR
59	install organic fill	10d	5/24/99	6/4/99	58	REMEDIATION CONTRACTOR
60	seed wetlands	5d	6/7/99	6/11/99	59	REMEDIATION CONTRACTOR
61	**Install new wells & decommission old wells**	**5d**	**6/15/99**	**6/21/99**		**REMEDIATION CONTRACTOR**
62	install new wells	3d	6/15/99	6/17/99		REMEDIATION CONTRACTOR
63	decommision old wells	5d	6/15/99	6/21/99		REMEDIATION CONTRACTOR
64	**Demobilize**	**2d**	**7/6/99**	**7/7/99**		**REMEDIATION CONTRACTOR**
65	**maintain and remove sediment control systems**	**93.88d**	**7/7/99**	**11/15/99**		**REMEDIATION CONTRACTOR**
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SECTION 3
SCOPE OF WORK

3.0 GENERAL REQUIREMENTS

3.0.1 The remediation contractor shall coordinate his work closely with the work performed by the UXO contractor. The following is a summary of the activities that are presently included in the UXO contractor's scope of work.

- excavation and screening of soil with lead less than 500 mg/kg
- excavation and screening of soils with lead over 500 mg/kg
- place screened soils into 200 cubic yard piles for testing
- based on the testing results consolidate the soil piles as required into three types of piles with the first pile(s) containing non-hazardous soil, and the second pile(s) containing soils that are a characteristic hazardous waste and the third pile(s) containing soils with less than 500 mg/kg of lead which will be used as fill under the new soil cover
- stormwater management at the excavations, at the soil screening operation, and at the soil stockpiles
- disposal of the screened material including scrap metal, ordnance, stone, sod, etc.
- backfilling the excavation with the soil that has less than 500 mg/kg of lead and/or off site borrow (off site borrow will be furnished by the remediation contractor but placed and compacted by the UXO contractor).

The following activities are included in the remediation contractor's scope of work, these activities will require close coordination with the UXO contractor to assure that the objectives of the remediation project are met. These activities will be performed before the UXO contractor has completely cleared the site of ordnance.

- layout areas to be excavated
- collect the confirmatory soil samples from the excavation and have them analyzed
- layout additional soil excavation if required based on the results of the confirmatory sampling
- take soil samples from the screened 200 cubic yard soil piles and have them analyzed
- maintain all records on the sampling that is performed during the excavation including sampling locations and sampling results
- based on the testing results classify each 200 cubic yard pile as either hazardous or non-hazardous or as soil with less than 500 mg/kg of lead

- dewater the excavations and the excavated materials.
- treat and discharge the water collected from the excavations and excavated material
- furnish off site fill at the excavations as required to backfill the EODT excavations to the original grade (placement of the fill and compacting of the fill will be by the UXO contractor) Note that on site material with less than 500 mg/kg should be used to the greatest extent possible for backfill. As long as the required EODT sequence of work allows, material such as the low lying hills or other on site material (i.e. material excavated for the new wetland, etc.) that is scheduled to be excavated which has less than 500 mg/kg of lead should be used as backfill into the excavations. If the required UXO clearance work sequence allows this flexibility it would minimize if not eliminate the need for off site material required for backfill into the excavations.

The remediation contractor shall be responsible for the following activities which will be performed either off site or after the site has been cleared of ordnance.

- preconstruction tasks including; wastewater discharge permits, wetlands permitting; soils solidification testing; landfill documentation; locating an off site borrow pit, and required submittals
- load the non-hazardous soils onto trucks and dispose of the soil at an off site disposal facility (trucks to be decontaminated before leaving the site)
- prepare the area for the soil solidification/stabilization process
- layout the area that will receive the 9 inch soil cover and collect soil samples to confirm the limits of the proposed area (goal is to cover all soil with lead over 60 mg/kg of lead)
- grading the site
- installation of the 9 inch soil cover including the storm water management system for the areas to be covered both during and after construction
- solidify/stabilize the soils that are a characteristic hazardous waste
- confirmatory sampling and testing of solidified/stabilized soils
- disposal of solidified/stabilized soils at an off site disposal facility
- install the Reeder Creek dewatering system
- dewater Reeder Creek
- excavate Reeder Creek sediments (UXO representative will be required for UXO Avoidance during sediment excavation)
- dewater excavated sediments
- stockpile, test and dispose of the excavated sediments
- restore Reeder Creek stream banks

- remove the Reeder Creek dewatering system
- construct new wetlands to replace the wetlands disturbed by the remediation project
- install groundwater monitoring wells and decommission the existing monitoring wells.

All work performed under this contract shall be under the supervision of a Professional Engineer registered in the State of New York.

Access to the site will be restricted from the exclusion zone around the areas that EODT is clearing of ordnance. The final radius of the exclusion zone has not be finalized yet but it could be up to 850 feet which would severely limit any other activities at the site.

The existing burn tray which is located on a concrete pad in the OB Grounds will not be disturbed or modified in any way by this project. SEAD will continue to use the burn tray after the completion of this project. The new soil cover will extend up to the burn tray.

3.0.2 As part of the base bid, the Remediation Contractor shall be required to treat (solidify/stabilize) up to 16,250 cubic yards of soil to acceptable levels. Provisions for retreatment of soil, if required, shall be made. Acceptable levels are defined as producing solidified/stabilized soil that meets the treatment criteria (passes TCLP hazardous waste disposal requirements) with a production rate sufficient to ensure completion of all soil treatment prior to the required completion date. Acceptable performance shall not be contingent upon pretreatment, soil moisture, weather or any other variable.

3.0.3 Each Contractor shall be responsible for furnishing all labor, material, and equipment and for performing all work required for protection of the environment during the implementation of the work assigned to each contractor.

3.0.3.1 Each Contractor shall be responsible for maintaining the environment in its natural state to the greatest extent possible during the removal action. The Contractors will consider air, surface water, groundwater, and land resources. In order to prevent, and provide for abatement and control of any environmental pollution arising from the Contractors' activities in conducting the removal action, the Contractors, and any subcontractors, shall comply with all applicable federal, state, and local regulations.

3.0.3.2 Assuring compliance with the provisions of this section by subcontractors shall be the responsibility of the Contractors.

3.0.3.3 The land resources within the project boundary and outside the limits of permanent work performed as part of this removal action shall be preserved in their present condition or restored to a condition that will appear to be natural after completion of the removal action. The Contractors shall confine all construction activities to the areas defined by the plans and specifications.

3.0.3.4 The Contractors shall not pollute any streams or wetlands with any hazardous constituents. The Contractors shall comply with all federal, state, and local regulations regarding pollution of surface waters and an emergency response plan is required to prevent pollution caused by inadvertent releases.

3.0.3.5 The Contractors shall take all necessary measures, in addition to those required by federal, state, and local regulations, to minimize the migration of dust off-site. Dust control requirements and air monitoring requirements are described in these specifications.

3.0.3.6 All construction and excavation activities shall be conducted so as to minimize erosion. The Contractors shall prevent off site surface water from entering their excavation, and shall prevent contaminated on-site surface water from leaving the site. Drainage control requirements are described later in these specifications.

3.0.4 The Contractors shall furnish all equipment, labor, materials, quality control measures, and health and safety provisions necessary to complete their work described in these specifications for final acceptance.

3.0.5 The Contractors shall be responsible for protecting and maintaining existing roads and fences. The Contractors shall be responsible for locating and protecting any existing utilities within the work area.

3.0.6 All materials and equipment used to complete the work described in these specifications shall be adequate in capacity for the required usage, shall not create unsafe conditions, and shall meet the requirements of all applicable codes and standards. All equipment brought onto the SEDA site must be decontaminated and in proper working condition at the time of arrival at the SEDA site. All equipment may be inspected by the Army's representative before it is used at the site. Equipment found to be contaminated or in need of repair shall be removed from the SEDA site immediately. Additional mobilizations to the SEDA site caused by rejection of faulty or contaminated equipment will be at the Contractors' expense.

3.0.7 The Contractors shall be responsible for providing any required temporary site utilities such as telephone, electricity, water and sanitation. All utilities shall be removed at the end of construction by the contractors.

3.0.8 No on-site work will be permitted until required submittals, if applicable, for that activity have been approved by the Army as provided in the individual sections of these specifications. Work conducted during this removal action by the Contractors shall be limited to execution of the activities defined by these specifications. The Contractors shall employ a professional engineer of the discipline required for specific service on this project licensed in the State of New York. The Contractor shall assume full responsibility for the health and safety of all on-site personnel that are contracted or subcontracted to them and the protection of all their equipment and materials.

3.0.9 Support Requirements

3.0.9.1 Meetings

The Contractors shall attend all meetings specified in this section and any other meetings called by the Contracting Officer or his representatives. Subcontractors may attend when involved in the matter to be discussed, or when requested by the contracting officer or his representatives or the Contractors.

3.0.9.1.1 Meeting Minutes

The Contractors shall record minutes of each meeting and shall furnish copies to the Contracting Officer or his representatives within 10 working days after the meeting.

3.0.9.1.2 Meeting Schedule

All meetings shall be held at SEDA, at dates and times to be agreed upon during the preconstruction conference. Changes to the meeting schedule shall be by agreement between the Contracting Officer or his representatives and the Contractors, with appropriate written notice to all parties involved.

3.0.9.1.2.1 Preconstruction Conference

A preconstruction conference shall be held be held prior to mobilization at SEDA. In addition to the Army and the Contractors, the meeting may be attended by representatives of the regulatory agencies having jurisdiction over this project. The agenda for this meeting will be determined prior to the meeting.

3.0.9.1.2.2 Post Construction Conference

A post construction conference shall be held prior to final inspection of the work to discuss and resolve all unsettled matters.

3.0.9.1.2.3 Progress Meetings

Progress meetings shall be held at a frequency of once per month during the performance of the work to review operating performance and any problems that may have arisen.

3.0.10 Definitions and Acronyms

This sections contains the definitions of words, phrases, acronyms, and abbreviations used in the text of these specifications and requiring special interpretation.

3.0.10.1 Definitions

Project sites - The sites consists of all areas within the five SWMU boundaries as shown on the drawings.

Work areas - The work areas includes all portions of the project sites affected by the Removal Action. This includes the excavation area, staging area, and decontamination area.

Exclusion zone - This is the region of the site where contamination exists or where remedial activities are or will occur. The boundaries of the exclusion zone may vary during the Remediation project.

Army - This term refers to the United States Department of the Army, including, but not limited to, United States Army Corps of Engineers and Seneca Army Depot Activity personnel and authorized representatives of these groups.

Subcontractor - A subcontractor is any firm or individual contracted by the Contractors to perform a portion of the removal action.

Regulators - This term refers to all authorized representatives of the United States Environmental Protection Agency, United States Occupational Safety and Health Administration, New York State Department of Environmental Conservation, New York State Department of Health, and any other federal, state, or local government agency with jurisdiction over the site.

Remediation Project - The Remediation Project describes this entire project from the notice to proceed until completion, and includes the initial plan preparation, all field work, and final report preparation.

TSD Facility - A hazardous waste treatment, storage, or disposal facility permitted pursuant to the requirements of 40 CFR 260 through 270.

Hazardous Waste - A substance determined to be a hazardous waste by application of the criteria in 40 CFR 261.

Contaminated Soil - The soil that contains concentrations of lead in excess of the criteria listed in these specifications.

3.0.10.2 Acronyms

ANSI	American National Standards Institute
API	American Petroleum Institute
ASP	Analytical Services Protocols
ASTM	American Society for Testing of Materials
CDAP	Chemical Data Acquisition Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
ES	Engineering-Science, Inc.
FS	Feasibility Study
HDPE	High-density polyethylene
IEEE	The Institute of Electrical and Electronic Engineers
IPCEA	Insulated Power Cable Engineers Association
μg/kg	micrograms per kilogram
mil	0.001 inch
mm	millimeter
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Code
NESC	National Electrical Safety Code

NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PAH	Polynuclear Aromatic Hydrocarbons
PID	Photoionization Detector
QA	Quality Assurance
QC	Quality Control
RI	Remedial Investigation
SARA	Superfund Amendments and Reauthorization Act
SEDA	Seneca Army Depot Activity
SHSO	Site Health and Safety Officer
SOP	Standard Operating Procedure
SWMU	Solid Waste Management Unit
TAGM	Technical and Administrative Guidance Memorandum
TCLP	Toxicity Characteristic Leaching Procedure
TSD	Treatment, Storage, or Disposal

3.1 INSTITUTIONAL REQUIREMENTS

3.1.1 CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) is the controlling legislation in the performance of this removal action. In addition to any other applicable federal, state, and local regulations, the following regulations also form a part of this specification:

Federal:

29 CFR 1910 and 1926	Occupational safety and health standards
40 CFR 50	Ambient air quality standards
40 CFR 58	Ambient air quality surveillance
40 CFR 61	National emissions standards for hazardous air pollutants (NESHAPS)
40 CFR 260	Hazardous waste management system - general
40 CFR 261	Identification and listing of hazardous waste
40 CFR 262	Standards applicable to generators of hazardous waste

40 CFR 263	Standards applicable to transporters of hazardous waste
40 CFR 264	Standards for owners and operators of hazardous waste treatment, storage, and disposal facilities
40 CFR 265	Interim status standards for owners and operators of hazardous waste treatment, storage,
49 CFR 171-177	Hazardous material transportation regulations

New York State:

6 NYCRR 360	NYSDEC rules for solid waste management facilities
6 NYCRR 364	NYSDEC rules for transport of regulated waste
6 NYCRR 375	NYSDEC rules for inactive hazardous waste sites

United States Army Corps of Engineers:

ER-1110-1-263	Chemical Data Quality for Hazardous Waste Remedial Activities
ETL 1110-1-158	Treatability Studies For Solidification/Stabilization of Contaminated Material
USACE EM 385-1-1	Safety and Health Requirements Manual, Sept.1996

Other:
All other relevant New York State Regulations
All local regulations regarding transport of hazardous materials

3.1.2 The Contractors shall be responsible for obtaining all NYSDEC permit equivalents associated with their portion of the work and furnishing the permit applications for filing with the proper authorities.

3.1.2.1 Odor, dust and noise control shall be limited in accordance with State and local regulations and ordinances. It shall be the contractors' responsibility to meet these requirements for their portion of the work.

3.1.3 The Remediation Contractor shall assure that all facilities that receive hazardous wastes from this site meet the requirements of 40 CFR 260 through 268. The Remediation Contractor shall assure that all facilities that receive nonhazardous solid waste from this site meet the requirements of 6 NYCRR 360.

3.1.4 The Remediation Contractor shall provide supporting documentation to complete hazardous waste manifests and to obtain services of permitted treatment, storage and disposal facilities if, during the performance of this work, off-site disposal of any hazardous waste is performed. With regard to disposal of wastes from this site, the Army will be the Waste Generator as defined in 40 CFR 262.

3.1.5 The Contractors shall comply with all applicable codes and standards. At a minimum, the Contractors will comply with the following codes and standards:

3.1.5.1 National Fire Protection Association (NFPA) Standards

3.1.5.2 Electrical material and equipment shall conform in all respects to the latest approved standards of the following:
(i) National Electrical Manufacturers Association (NEMA).
(ii) The American National Standards Institute (ANSI).
(iii) The Institute of Electrical and Electronic Engineers (IEEE).
(iv) Insulated Power Cable Engineers Association (IPCEA).
(v) National Electrical Code (NEC).
(vi) National Electrical Safety Code (NESC).

3.1.5.3 American Standards for Testing Materials (ASTM)

3.2 COMPLETE SYSTEM ENGINEERING REQUIREMENTS

3.2.1 <u>Work Plan</u>

Each Contractor shall prepare and submit for approval a Work Plan under which all their work shall be performed. The Work Plans shall fully describe their work to be conducted for the removal action. At a minimum, the Work Plan will discuss the following items:

- Title Page with approval signatures,
- Organization chart and description of roles of key personnel,
- Project Schedule,
- Excavation, backfilling, compaction, and grading plan

- Erosion/dust control plan,
- Site control and security plan,
- Air monitoring Plan
- Mobilization (including decontamination procedures)/demobilization,
- Confirmatory sampling plan and a
- Site layout.

The dates for submission and requirements are described in the Contract Data Requirements List shown in Appendix D and the Data Items Description shown in Appendix E.

3.2.1.1 Excavation, Backfilling, Compaction and Grading Plan

Prior to commencement of excavation, each Contractor shall submit an Excavation, Backfilling, Compaction and Grading Plan as part of the Workplan, for earthwork to be accomplished. The plan shall show the proposed sequence of operations; the type, rated capacity, and quantity of equipment to be used in the excavation phase or sequence; plans showing locations and configuration of proposed temporary stockpiles; the drainage and dewatering plans, which show the control and removal of surface water and groundwater flowing toward and tending to collect in excavations.
The plan shall also address handling and treatment of water from dewatering operations; transportation and disposal of contaminated soils, borrow material sources/test data; soil testing labs (physical and chemical testing):sediment and erosion control (especially for sediment removal in Reeder Creek);stockpile liner and cover construction; with supporting calculations.
The Plan shall also describe how the final DOD UXO clearance requirements affect the design and construction of the soil cover. For example the DOD may require a 4 foot cover consisting of a one foot cover, two feet of screened material and one foot of soil that is scanned insitu for UXO. The work plans shall describe how the final DOD requirements will be met (and documented) while still balancing the cut and fill to the greatest degree possible.

3.2.1.2 Erosion/Dust Control Plan

The Contractors' plan shall discuss proposed erosion/dust controls including run-on and run-off control and management of stockpiled soil.

3.2.1.3 Site Control and Security Plan

The Contractors' plan shall discuss proposed procedures for controlling access to the work areas to authorized personnel only and for complying with all SEDA security requirements.

3.2.1.4 Air Monitoring Plan

The Contractors' plan shall discuss proposed air monitoring and action levels. The air monitoring and action levels section will indicate how the Contractor intends to comply with NYSDEC TAGM (HWR-89-4031), and is separate from the air monitoring and action level requirements for the site-specific health and safety plan.

3.2.1.5 Mobilization/Demobilization and Site Restoration Plan

The Contractors' plan shall discuss his proposed mobilization procedures including temporary site utility and decontamination facilities. The demobilization plan shall discuss site cleanup and site restoration activities.

3.2.1.6 Confirmatory Sampling Plan

The Remediation Contractor shall include a plan to sample the sides and bottom of the excavated site and the soils around the perimeter of the area that will receive the soil cap to verify that the remedial action objectives have been met. Samples taken will be analyzed for total lead so that the results will be comparable to the requirements (60, 500 and 800 mg/kg lead). In addition the confirmatory sampling plan shall cover the required sampling of the 200 cubic yard soil piles to determine whether the soil can be handled as a non-hazardous waste. The plan shall also address the required confirmatory sampling of the solidified/stabilized soils and off site borrow material.

3.2.1.7 Project Drawings

Each Contractor shall provide the following drawings as required by these specifications.

- Site Layouts showing the proposed sequence of work and the pile management area design and treatment system layouts.
- Final as built drawings shall be required. The remediation contractor shall be responsible for collecting all surveying data and developing the as built drawings. As built drawings shall present the following information; limits of soil excavated by type; limits of the soil cover (including DOD UXO clearance criteria if applicable); limits of sediments excavated; limits of the new wetland; and the locations of all insitu confirmatory sampling.

All drawings shall be a minimum of 11 inches x 17 inches.

3.2.2 Site Specific Health and Safety Plan

Each Contractor shall prepare and submit a site specific Health and Safety Plan that describes the safety, health and emergency response procedures to be implemented during their work. Protocols necessary for protecting workers and potential on-site and off-site receptors from hazards posed by activities during the site remediation are to be specified. The dates for submission and requirements are described in the Contract Data Requirements List shown in Appendix D and the Data Items Description shown in Appendix E.

3.2.2.1 The health and safety documents developed by the contractor shall comply with the requirements specified in ER 385-1-92 entitled "Safety and Health Elements for HTRW Documents" as presented in Appendix B. These requirements do not supersede, but are in addition to, any federal, state, or local regulations. These requirements are in accordance with the Occupational Health and Safety Administration (OSHA) guidelines established in 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response." If a conflict occurs between these requirements and the current regulations, the more stringent shall apply. The completed Health and Safety Plan (HSP) will be sent to NYSDEC and New York State Department of Health (NYSDOH) for review. The Contractors must comply with all federal, state, and local safety codes and regulations at all times and is responsible for educating his supervisors and employees of the safety requirements and practices to be followed during the course of the work. The Contractors shall be solely and completely responsible for conditions of their job site, including safety of all persons and property during the performance of the work. This requirement shall apply continuously and not be limited to normal working hours. If at any time the NYSDOH Community Air Monitoring Guidelines are exceeded, the Contractor shall notify NYSDEC and NYSDOH. The Contractors shall comply with all SEDA health and safety and emergency response requirements. It is the responsibility of the Contractors to coordinate activities with SEDA personnel, and to make all Contractors' employees and subcontractors aware of SEDA policy. The Contractor will provide written certification that a health and safety program has been developed, implemented and maintained. The dates for submission and requirements are described in the Contract Data Requirements List shown in Appendix D and the Data Items Description shown in Appendix E.

3.2.2.2 The health and safety plan will contain the following minimum subject areas. Each contractor shall maintain a copy of the site-specific Health and Safety Plan on site at all times.

- Health and safety organization
- Hazard assessment

- Training
- Medical surveillance
- Site control
- Standard operating procedures
- Personal protective equipment
- Personal hygiene and decontamination
- Equipment decontamination
- Air monitoring
- Emergency equipment and first aid requirements
- Emergency response/contingency plans and procedures
- Heat/cold stress monitoring
- Fall protection
- Trenching and shoring
- Confined space entry
- Logs, reports, and record keeping
- Site description and evaluation.

3.2.2.3 The work of the remediation contractor shall be performed under the guidance of UXO contractor for UXO avoidance. For reference an Abbreviated Site Safety and Health Plan for UXO Avoidance is presented in Appendix F. The remediation contractor's UXO subcontractor shall provide a complete UXO Avoidance plan for the activities that are included in the remediation contractor's scope of work.

3.2.3 Health and Safety Program

Each contractor shall prepare and submit a written certification that a Health and Safety Program (HSP) has been developed, implemented and maintained.

3.2.4 Sampling and Analysis Plan

3.2.4.1 The Remediation Contractor shall prepare and submit a Sampling and Analysis Plan (SAP). This plan shall address soil sampling, wastewater sampling and air sampling. The plans shall be submitted for Army approval. At a minimum, the Contractor must comply with all applicable EPA and NYSDEC quality assurance (QA) requirements, and with the United States Army Corps of Engineers document: "Requirements for the Preparation of Sampling and Analysis Plans EM 200-1-3 dated September 1,1994

The dates for submission and requirements are described in the Contract Data Requirements List shown in Appendix D and the Data Items Description shown in Appendix E.

3.2.4.2 The Contractor shall identify the key personnel within their project staff responsible for QC. At a minimum, the Contractor shall designate a site quality control manager who will be responsible for, and have authority for all QC matters at the site. The site quality control manager shall be responsible for ensuring that all Contractor and subcontractor personnel at the work site have been properly trained in the site-specific QC procedures. The site quality control manager shall have no duties other than QC.

3.2.4.3 The Contractor shall maintain current records of all QC activities performed during the removal action. These records should be in a legible and easily understood form, and shall be made available to the Army and the regulators upon request.

3.2.5.4 The Contractor shall not conceal any work containing uncorrected defects. If deficiencies indicate that the Contractor's quality control system is inadequate or does not produce the desired results, corrective action in both the work and the quality control system shall be taken by the Contractor.

3.2.5 Document Format. All final drawings shall be of engineering quality in drafted form with sufficient details to show interrelations of major features on the installation site map. When drawings are required, data may be combined to reduce the number of drawings. The work plans and final report shall consist of 8.5 x 11" pages with drawings folded, if necessary, to this size. A decimal paragraphing system shall be used, with each section and paragraph of the reports having a unique decimal designation. The report covers shall consist of vinyl 3-ring binders and shall hold pages firmly while allowing easy removal, addition, or replacement of pages. A report title page shall identify the Contractor, the Corps of Engineers, Huntsville Division, and the data. The Contractor identification shall not dominate the title page. Each page of draft and final reports shall be stamped "DRAFT" and "FINAL", respectively. Each report shall identify the members and title of the Contractor's staff which had significant, specific input into the report's preparation or review. Submittals shall include incorporation of all previous review comments accepted by the Contractor as well as a section describing the disposition of each comment. Disposition of comments submitted with the final report shall be separate from the report document. All final submittals shall be sealed by the registered Professional Engineer-In-Charge.

3.3 SITE CONTROL AND SECURITY REQUIREMENTS

3.3.1 Site Control

Each Contractor shall establish a system to control access to the work areas. At a minimum, these areas will include an exclusion zone (defined as the area where contamination exists), a stockpile area, and a staging area. Each Contractor will establish a decontamination area in compliance with these specifications.

3.3.2 SEDA Requirements

Each Contractor shall be responsible for complying with all SEDA requirements, including, but not limited to, access control, site security, and work permit requirements. Each Contractor shall be responsible for determining the applicable SEDA requirements. At a minimum, the contractor shall meet the SEDA requirements of this subsection. The following requirements must be followed by the Contractors at Seneca Army Depot Activity to facilitate entry and exit of Contractors' employees and to maintain security.

3.3.2.1 A list of all Contractors' employees, subcontractors and suppliers indicating firm name and address shall be furnished through POC/COR to the Counterintelligence Division, Building 710. A confirmation of employment SDSSE-SC Form 268 shall be executed by the Contractors concerning each employee, to include all subcontractors and their personnel. No forms will be transferred from another file if the Contractors have other on-going contracts at SEDA. The Contractors shall provide a list of personnel who are authorized to sign Form 268 for the firm. A sample of each signature is required. Counterintelligence Division must be notified, in writing, of any changes to this list. All completed forms shall be provided through COR/POC to the Counterintelligence Division 72 hours prior to commencement of work. Failure to complete Form 268 correctly will result in employee's denial of access to Seneca. The Counterintelligence Division must be notified, in writing through POC/COR to Counterintelligence, at least 72 hours prior to requesting any action. The chain of command for all contractors actions will be through POC/COR to Counterintelligence Division. There will be no exceptions.

3.3.2.2 Camera permits require written notice from the POC/COR prior to access. Open camera permits will not be issued. The following information is required:

a. Camera make, model and serial number.
b. Contract name and name of individual responsible for the camera.
c. Dates camera will be used.
d. Where it will be used.
e. What will be photographed and why.

3.3.2.3 If a rental, leased or privately owned vehicle is required in place of a company vehicle, the following information is required:

a. Name of individual driving.
b. Year, make, model, color and license plate of the vehicle.
c. Typed letter on company letterhead indicating that the company assumes responsibility for rental, leased or privately owned vehicles.

3.3.2.4 All access media will be destroyed upon expiration data of contract. If an extension is required, a list of employee names and new expiration data must be furnished to the Counterintelligence Division. Contract extensions must be made prior to the contract expiration data or new Form 268s will be required for each individual that requires an extension.

3.3.2.5 Traffic laws of the State of New York apply with emphasis on the following regulations. All are subject to change with road conditions or as otherwise posted.

a. Speed Limit: Controlled Area as posted
b. Ammo Area - 5 mph
c. Limited/Exclusion Area - 25 mph

3.3.2.6 Contractor vehicles (trucks, rigs, etc.) shall be parked in areas designated by the director of Law Enforcement and Security. Usually parking will be permitted within close proximity to the work site. No parking is allowed within 30 feet of a depot fence, as these are clear zones.

3.3.2.7 Available entrance/exits gates are Post 1, Main Gate (NY Highway 96, Romulus, New York; open for personnel entrance and exit 24 hours daily, 7 days a week) and Post 3, (entrance to North Depot Troop Area, located at end of access road from Route 96-A is open 7 days a week for personnel and vehicle entrance and exit).

3.3.2.8 The following restriction apply to all Contractor personnel:

1. Cameras, binoculars, weapons and intoxicating beverages will not be introduced to the installation, except by written permission of the Director/Deputy Director of Law Enforcement and Security.

2. Matches or other spark producing devices will not be introduced into the Limited/Exclusion or Ammo Area except when the processor of such items is covered by a properly validated match or flame producing device permit.

3. All vehicles and personal parcels, lunch pails, etc. are subject to routine security

inspections at any time while on depot property.

4. All building materials, equipment and machinery must be cleared by the Director of Engineering and Housing who will issue a property pass for outgoing equipment and materials.

3.3.2.9 Contractor employees are cleared for entrance to the location of contract work only. Sight-seeing tours or wandering from the work site is NOT AUTHORIZED. The following items must be adhered to in order to obtain access to the facility:

a. Written notification will be provided to the Counterintelligence Division (Ext. 30202) at least 72 hours prior to overtime work or prior to working on non-operating days.

b. Security Police (Ext. 30448/30366) will be notified at least two hours in advance of any installation or movement of slow moving heavy equipment that may interfere with normal traffic flow, parking or security.

3.3.2.10 All Contractor/subcontractor employees on-site shall be aware of potential violations of law or regulations, including:

a. Minor. Offenses committed by a Contractor personnel which are minor in nature will be reported by the Director of Law Enforcement and Security to the Contracting Officer who in turn will report such incidents to the Contractor for appropriate disciplinary action.

b. Major. Serious offenses committed while on the installation will be reported to the FBI. Violators may be subject to trial in Federal Court.

3.3.2.11 The following rules shall be observed with regard to explosives-laden vehicles. Vehicles such as vans, cargo trucks, etc., carrying explosives will display placards or signs stating "EXPLOSIVES". Explosive ladened vehicles will not be passed. When an explosive laden vehicle is approaching, pull over to the side and stop. When catching up with an explosive laden vehicle, slow down and allow that vehicle to remain at least 100 feet ahead. When approaching an intersection where an explosive laden vehicle is crossing - STOP - do not enter the intersection until such time as the explosive carrier has passed through and cleared the intersection. When passing a vehicle that is parked and displaying "Explosive" signs, slow down to 10 miles per hour and take every precaution to allow more than ample clearance.

3.3.2.12 All Contractor employees are required to return all identification badges and passed on the last day of employment on the depot. The Contractor is responsible for the completion of all turn-ins by his employees and informing the Counterintelligence Division and the depot organization administering the contract, for termination of any employee's access to the depot.

3.4 PRECONSTRUCTION TASKS

The preconstruction tasks include:
- permitting (wetlands and wastewater),
- locate the off site borrow pit and sample soils,
- get certification that landfills meet all applicable regulation,
- soil sampling to establish the relationship between total lead and TCLP lead (by Parsons),
- and soil solidification testing to establish the required mix for solidification of soils.

3.4.1 Permits

Permits for wetlands restoration (if required) and wastewater discharge should be obtained by the remediation contractor prior to beginning the work.

The contractor will be responsible for obtaining a stormwater discharge permit. Each contractor shall develop a stormwater pollution prevention plan for their activities, all applicable local and state sediment and erosion controls shall be incorporated into the pollution prevention plan. The stormwater prevention plan shall also include the following features.
- A schedule that shows that construction activities have been scheduled to limit the impact of climate changes or severe weather events.
- A site plan with the sediment erosion control system layout including location of temporary dams, pump stations, hay bales, silt fences, and sediment basin or basins sized at 3,600 cubic feet for every acre drained.
- The plan should address how to stabilize disturbed areas that will not be re-disturbed for 21 days or more than 14 days since the last disturbance.
- The plan shall allow for site inspections every 7 days or within 24 hours of a storm event of 0.5 inches or greater.
- The pollution prevention plan shall be kept on site.
- The stormwater pollution plan should address how the stormwater from the OB Grounds will be handled while the Reeder Creek sediment removal is done.

3.4.2 Off site borrow pit

Prior to starting construction the remediation contractor shall locate the off site borrow pit. The remediation contractor will be responsible for evaluating the alternative borrow pit sites to assure that the following criteria are met. First the material must not be contaminated therefore the soils in the borrow pit must be sampled and analyzed. There must be enough material available to meet the project requirements otherwise additional off site material will have to be brought on site. The remediation contractor shall estimate the amount of borrow available. The type of borrow must meet the project requirements. Clean fill can be used to backfill excavations and as part of the soil cover but the top 4 inches of the cover must meet the specifications for topsoil. The remediation contractor shall submit a report that presents the data collected from the potential borrow pits that were evaluated. This report shall include a site plan of the alternative sites along with the estimated quantities of material available and the types of fill available. The report shall chemical and physical laboratory analysis results.

3.4.3 Documentation on the off site disposal facilities

Documentation on all off site disposal facilities that receive waste from this project shall be received before any material is shipped off site to those disposal facilities. The remediation contractor shall be responsible for obtaining the required documentation which shall include a letter from the NYSDEC stating that the proposed landfill facilities are in compliance with all applicable regulations and that the proposed disposal facility can accept the waste generated from this project. The remediation contractor shall be responsible for submitting a report to the NYSDEC that characterizes the wastes that will be generated. This waste characterization report shall include the soil and sediment analytical results collected during the RI along with the results of the soils solidification treatability study.

3.4.4 Establishing relationship between TCLP lead and total lead

Parsons has established the relationship between TCLP lead and total lead in the soils at the OB grounds. This involved taking soil samples from the OB grounds and analyzing the samples for both total lead and TCLP lead. The estimated volumes of soil that will to be solidified/ stabilized will be based on soil that exceeds 800 mg/kg of total lead. Based on this criteria the estimated amounts of the soils that fails TCLP for lead has increase from 4,000 to 16,250 cubic yards.

Soil samples from ten locations were collected at the OB grounds. These sample locations have the following ID numbers; BE-F-1, BE-F-2, BE-F-3, BE-F-7, BE-H-2, BE-H-3, BE-H-5, BE-B2, BE-B-3, and BE-B-4. The location of the sampling points is shown on figure 5. Each sample was tested for both TCLP lead and total lead. The laboratory analysis reports are presented in Appendix G along with a graph that plots the results. An analysis of the graph shows that the TCLP limit for lead of 5 ppm would be exceeded by soil with 800 ppm of total lead.

3.4.5 Soil solidification / stabilization testing

The remediation contractor shall be responsible for performing the bench scale testing for the solidification/stabilization of the contaminated soils at the OB Grounds. Representative samples of the soils at the OB Grounds shall be collected as soon as possible by the remediation contractor. The samples shall be analyzed, tested and the solidification process shall be designed in accordance with the U. S. Army Corps of Engineers Technical Letter No. 1110-1-158 entitled "Engineering and Design Treatability Studies for Solidification / Stabilization of contaminated material" dated 28 February 1995. The bench scale testing shall be performed by the remediation contractor as a pre-construction task.

3.5 MOBILIZATION

3.5.1 Utilities

Each Contractor shall be responsible for mobilization of temporary site facilities for the performance of their work. The Contractors shall provide and maintain all temporary site utilities including telephone, electricity, water and sanitation. The contractor shall furnish portable sanitary facilities, communications equipment, and potable water. Payment for telephone, electricity and water will be through SEDA. The Contractors shall coordinate hi utility requirements with the owner. Water from hydrants may be available at some other part of the base or as an alternative tank trucks may pump water from Seneca Lake. There is power available near the site, details for any hook up will have to be made after a field inspection.

3.5.2 Site Clearance

Each Contractor shall locate, identify, and protect utilities from damage during the execution of their work. The Contractors shall protect survey benchmarks and groundwater monitoring wells from damage or displacement. The UXO Contractor shall remove surface debris and clear areas of ordnance required for site access and excavation.

3.5.3 Security Fence

The Contractors shall be responsible for preventing entry into the exclusion zone, excavation, and any other potentially hazardous locations. The Contractors shall construct a security fence around the work areas where required by the contractor's health and safety plan .

3.5.4 Decontamination Facility.

3.5.4.1 This section describes the basic requirements for constructing a decontamination facility for cleaning site vehicles prior to leaving the site. These requirements apply to all excavation equipment, and any trucks used to haul contaminated soil.

3.5.4.2 Each Contractor shall supply all labor, materials, and equipment to design, construct, and equip a decontamination facility to support their portion of the work in accordance with these specifications. The Contractors shall design and operate the decontamination facility such that none of the fluids used in the decontamination process are released to the environment. The decontamination facility shall be sloped such that the fluids used will drain to a sump from which the fluids may be transferred to the water storage unit for eventual treatment and discharge. All decontamination fluids will be managed in accordance with these specifications. The Contractors shall decontaminate all excavation equipment prior to use for backfilling.

3.6 EXCAVATION AND BACKFILLING

3.6.1 Staging Areas

3.6.1.1 The Contractor shall construct and maintain separate staging areas for each of the following: the stockpiling of screened soil (prior to testing); soil that has lead at less than 500 mg/kg; non-hazardous soils, soils that are a characteristic hazardous waste and solidified/ stabilized soils.

3.6.1.2 The Contractors shall line all their staging areas. The contractor shall be responsible for designing and constructing the liner system and cover systems as necessary to provide containment and protection based on the composition of the excavated materials and the contractors proposed equipment and operational procedures. The Contractors shall cover all soils in their staging areas with a tarp and weighted appropriately to prevent erosion from wind or rain. The Contractors shall use berms or other equivalent controls to prevent surface water run-on and runoff from the staging areas.

3.6.1.3 The Contractors shall clearly identify the locations of the different staging areas on their site plan. The staging areas will be constructed such that materials which have satisfactorily met the requirements of confirmatory sampling can be distinguished from the materials awaiting the results of the confirmatory sampling. The staging area shall have sufficient capacity to assure that storage capacity does not impact the work schedule.

3.6.1.4 The Contractors shall minimize vehicular traffic on the liners in order to prevent damage to the liner. The Contractor shall use only rubber-tired loaders in the staging area to minimize damage to the liner. The Contractor shall inspect the liners on a regular basis to ensure the integrity of the liner has not been breached, and shall repair or replace damaged liners.

3.6.2 Preparation for Excavation

The Contractor shall identify the required lines, levels, contours, and datum. The Contractor shall survey the site in order to delineate the proposed extent of the excavation. The Contractor shall identify and protect utilities and existing benchmarks from damage.

3.6.2.1 Surveying

The existing benchmarks at the OB grounds are shown on figure 23. All surveying shall be done under the supervision of a New York licensed and registered surveyor. Tasks that require surveying include the following;

- layout of excavations
- layout of areas with new 12 inch soil cover including documentation of any DOD UXO clearance criteria
- layout of sediment removal areas
- Reeder Creek cross sections prior to and after sediment removal
- sampling locations
- layout of the new wetlands area
- monitoring well locations and casing elevations
- new survey monuments if required

3.6.3 Excavation

3.6.3.1 The UXO Contractor shall excavate all soil from the project site in which the soils exceed the 500 ppm lead criteria for soils. Excavations will not be performed during rain events. In addition some soils which have less than 500 mg/kg of lead will be excavated and screened for ordnance such as the low lying hills and certain portions of the burn pads and berms. The areas that have soils with lead over 500 mg/kg are defined in Figures 6 through 13. Some of the areas with lead levels less than 500 mg/kg lead which will be excavated for ordnance screening only are shown on the figures as Case 3 soils. Additional Case 3 soils will be identified in the field by EODT as part of the planned UXO clearance activities.

The sequence of the excavation is very important and must follow the following guidelines. First, the soils that are shown as Case 1 soils on Figures 6 through 13 shall be excavated and placed in the stockpile for the soils that will be solidified/stabilized, no sampling of these stockpiled soils will be required since previous sampling results indicates that these soils already exceed TCLP limits. Once the excavation confimatory sampling results show that the soils with greater than 800 mg/kg have been removed than the soil classified as Case 2 (soils with lead above 500 mg/kg but below 800 mg/kg) should be excavated and placed into 200 cubic yard soil piles for testing (TCLP metals) - these soils will not be used for backfill, they will be disposed of based on the results of the TCLP analysis. Again once the confirmatory sampling in the excavation indicates that all the Case 2 soils are removed than the Case 3 soils which are below 500 mg/kg lead shall be excavated.

3.6.3.2 Excavations shall be made and maintained in accordance with the Grading and Excavation Plan. The Contractors shall grade the top perimeter of their excavation to prevent surface water inflow.

3.6.3.3 The UXO Contractor shall be responsible for excavation of the areas delineated on the figures. Additional excavation of soils with lead less than 500 mg/kg which will be screened for ordnance will also be required, these areas will be defined by EODT in the field.

3.6.3.4 The excavation limits shown in the figures should be considered as initial. The remediation contractor shall take soil samples along the perimeter and bottoms of the areas excavated to confirm that the proposed limits of excavation meet the specified performance standards. These samples shall be analyzed for total lead. No backfilling or excavation of the next type of soil shall begin until the laboratory results from these samples are reviewed and the final limits of excavation are defined. If the laboratory results indicate that additional soils must be excavated than the contractor shall notify the Contracting Officer and await his instructions.

3.6.3.5 The Contractors shall notify the Army of any unexpected subsurface conditions and discontinue work in the affected area until notified to resume work. Work is to continue in unaffected portions of the site.

3.6.3.6 The Contractors shall stockpile all soils in accordance with these specifications. All screened soils shall be placed in 200 cubic yard stockpiles for confirmatory testing. Once the results of the testing has been received the stockpiles may be consolidated by type if required.

3.6.3.7 The Contractors shall use appropriate dust control measures to minimize emissions from their excavations The Remediation Contractor shall conduct air monitoring in accordance with the NYSDOH "Community Air Monitoring Plan" as presented in Appendix A.

3.6.3.8 The Contractors shall record the volume of material excavated and report this volume to the Army as part of the weekly reports required in these specifications.

3.6.3.9 The Remediation Contractor shall prepare a drawing which documents the extent of the excavations, and identifies the locations where each in-situ confirmatory soil sample was taken. Each sample point shall be located with surveyed coordinates that tie into the existing survey monuments.

3.6.3.10 The sides of the excavations shall be sloped as required to prevent walls of the excavation from caving in. Each excavation over 4 feet deep shall be inspected by the site Health & Safety officer to assure that the slopes are properly stabilized, before anyone allowed to enter the excavation. This shall apply to confirmatory sampling events as well as the excavation operations. The daily H&S meeting shall review the excavations planned for that day and review how each excavation shall be done so that slope stability is maintained as the excavation progresses.

3.6.4 Backfilling

3.6.4.1 The Contractor shall backfill with only certified clean backfill. The backfill shall come from either an off site facility or from the soil pile that contains the soil with less than 500 mg/kg of lead. For fill that is brought in from off site the contractor shall provide documentation that certifies that the material used as backfill is not contaminated. The documentation shall include laboratory testing results of soil samples from the borrow pit along with a description of the location of the borrow pit. Testing results of the soil samples from each borrow pit must be submitted for approval before any material is backfilled . At least one sample shall be collected from each borrow pit and analyzed for the following parameters. The results will be compared to the NYSDEC TAGMs to determine if the backfill is clean.

- TAL Metals
- Explosives
- TCL Organics (volatile and semi-volatiles)
- PCB/Pesticides

In addition the contractor shall visually inspect each truck load of fill to assure that the material is similar in appearance to the material that was sampled and tested at the borrow pit. Also the contractor shall take grab samples from three truck of fill each day and check the head space of the samples for volatiles. The material from the truck may not be backfill until the results of the headspace analysis is complete.

Satisfactory off site borrow materials for use as fill shall be materials classified in ASTM D 2487 as GW, GM, GC, SW, SM, SC and shall be free from roots and other organic matter, trash, debris, frozen materials, and stones larger than 3 inches in any dimension. Any material classified as SM shall have not more than 25 percent by weight passing the No. 200 sieve.

3.6.4.2 The Contractor shall not backfill soils if standing water is present in the excavation.

3.6.4.3 All material backfilled into the excavation shall be place in 12 inch lifts. The material shall not be excessively wet or dry at the time of placement, such that in the opinion of the construction manager adequate compaction would be prevented. Each layer shall be compacted by a minimum of four passes of a rubber tire roller or other compaction equipment approved by the construction manager. The construction manager may at his option may require that testing be done to demonstrate that the materials being backfilled are compacted to 90% of the maximum density at optimum moisture content as determined by ASTM D1557 (AASHTO T-180) Method D.

3.7 TREATMENT SYSTEMS

3.7.1 Soil Solidification/Stabilization

3.7.1.1 The Contractor shall solidify/stabilize all soils excavated from the project site that are a characteristic hazardous waste prior to disposal.

3.7.1.2 The Contractor shall transport all soils from the stockpiles to the solidification/stabilization process.

3.7.1.3 The Contractor shall size the solidification/stabilization system to process the material within the required schedule.

3.7.1.4 The solidification/stabilization process equipment shall include the mixing equipment, additive storage and feed equipment, forms, fork lifts, front end loaders, water trucks, etc. The equipment will comply with all federal, state, and local regulations, and with all applicable codes and standards. All equipment shall be capable of operating on a continuous or intermittent basis without a loss of process efficiency. The system shall employ sufficient flexibility and redundancy to meet the project objectives in a timely and cost-effective manner. The contractors work plan shall include a complete description of the equipment that will be used in the stabilization/solidification process.

3.7.1.5 The Contractor shall provide all materials and labor required to operate and maintain all equipment in accordance with the process objectives. The Contractor shall provide proper training to all Contractor and subcontractor personnel that will operate the equipment. The Contractor shall provide a copy of all standard operating procedures (SOPs) for all equipment on site. In addition, a copy of each SOP shall be maintained on site and will be available for inspection by the Army's representative.

3.7.1.6 The Contractor shall operate all equipment to minimize the time and cost of treatment.

3.7.1.7 All wastewater generated from the operations shall be managed in accordance with these specifications.

3.7.1.8 The Contractor shall be responsible for maintaining all equipment used as part of solidification/solidification process. Maintenance will include regular preventive maintenance, as required, prompt repair of all equipment removed from service due to breakdown, and replacement of all spare parts and special tools which have been used. Whenever possible, maintenance activities should be provided by Contractor personnel.

3.7.2 Treatment of Water

3.7.2.1 The following list presents the various tasks in which the contractor will be required to deal with water. The contractors work plan shall describe how the wastewater generated from each of these activities will be collected, treated and disposed/discharged.

- dewatering excavations of groundwater and stormwater
- stormwater runoff
- dewatering excavated soils
- dewatering the isolated sections of Reeder Creek
- diverting Reeder Creek around the sections isolated for sediment removal
- dewatering excavated sediments
- decontamination wastewater from the cleaning of vehicles leaving the site or soil processing equipment

3.7.2.2 The data collected on the groundwater during the RIFS as shown on Table 2-14 shows that many of the unfiltered groundwater samples that were analyzed had results that exceed some of the criteria for a Class D surface water as specified in the New York State Water Quality Regulations for Surface Waters (6NYCRR Part 700-705, September 1991). The Class D surface water criteria are presented on Table 2-13. The most frequent exceedance was for iron, while there were several exceedances of other metals. The data also shows that all the filtered groundwater samples that were analyzed had results that were below these surface water criteria. All these samples were filtered in the laboratory with a 0.45 micron filter. This data suggests that by filtering the discharge would meet the surface water criteria. The contractor shall include in his scope of work the sampling and testing of the filtrate from the filtration system that is employed. This sampling and testing shall be done during the initial start up of the filtration system. A minimum of three influent and three effluent samples shall be taken and analyzed for the parameters listed as the criteria for the Class D surface water. If the selected filtration system does not produce an effluent that meets the Class D surface water criteria then the contractor shall bring on additional treatment systems as required to meet these discharge criteria or dispose of the wastewater off site. The Class D water quality criteria may be superseded by the criteria established in the final discharge permit that the contractor shall obtain as one of the preconstruction tasks.

3.7.2.3 The Contractor may store wastewater in portable tanks appropriate for managing wastewater. All portable storage tanks or treatment systems must be certified as being clean before they are allowed on the site. The Contractor shall ensure that the tanks used have been constructed in accordance with all applicable codes and standards. The Contractor shall visually inspect all tanks for leaks and shall replace all leaking tanks.

3.7.2.4 The Contractor shall treat wastewater on site and shall discharge the treated water in accordance with an approved discharge permit. The contractor is responsible for obtaining all required discharge permits and is responsible for all the sampling, analysis and reporting requirements associated with the permits.

3.8 DRAINAGE CONTROL

The drainage control systems will require modifications as the different phases of the project are implemented. Initially the excavation of the individual areas will require that each excavation is provided with run-on and run-off controls. These controls shall be maintained until the excavation is backfilled and a temporary ground cover can be established over the excavation which is required if the area is not scheduled to receive the final soil cover for 21 days. The installation of the soil cover will require additional runoff controls and depending on the schedule of the work may require the use of sedimentation basins. If over 10 acres of the site is actively under construction without an established ground cover then sedimentation ponds will be required. In addition the drainage control plan will have to carefully schedule the handling of the stormwater runoff from the OB Grounds during the sediment removal activities in Reeder Creek. This may require the use of pumps to remove the stormwater from the low lying areas at the OB Grounds around the existing culverts that drain the area to Reeder Creek. These drainage culverts may have to be plugged while the stream is dewatered during sediment removal.

3.8.1 Run-on Control

The Contractors shall implement run-on control measures to prevent uncontaminated surface water from entering the work areas of the site. These measures shall consist of berms and or ditches that redirect the surface water around the site to the historic surface water discharge points.

3.8.2 Runoff Control

The Contractors shall implement measures to prevent untreated surface water from leaving the work areas of the site. These measures shall include berms or ditches that collect surface water from the work areas along with silt fences and hay bales to prevent contaminated sediments from being transported off site. Each excavation shall be provided with its own runoff control system.

3.8.3 Excavation Drainage

The Remediation Contractor shall provide pumps, hoses, and any other equipment necessary to remove accumulated water from the excavation. The Contractor shall be required to remove water from the excavation when necessary to continue excavation activities, or if a safety threat exists. The water from the excavation shall be collected and treated in accordance with the requirements of these specifications.

3.9 EROSION/DUST CONTROL

3.9.1 Erosion Control

The Contractors shall provide the materials and labor required to control erosion of soils from their work areas. These measures may include limiting the exposure area, chemical binders, mulches, geotextiles, jute netting, riprap or the use of fast growing grasses as temporary covers over exposed areas.

3.9.2 Dust Control

The Contractors shall take necessary measures, in addition to those required by federal, state, and local regulations, to eliminate or minimize the migration of dust off site due to their site activities. At a minimum, the Contractors shall follow the requirements of the NYSDEC TAGM HWR-89-4031, "Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites," October, 27, 1989 (or most recent version) and the monitoring requirements in these specifications.

3.10 AIR MONITORING AND ACTION LEVELS

3.10.1 General

The Remediation Contractor shall monitor the emissions from the excavations, staging area, and the solidification / stabilization process in order to assure compliance with all federal, state, and local regulations. Monitoring shall be conducted in accordance with the NYSDEC TAGM, "Fugitive Dust Suppression and Particulate Monitoring at Inactive Hazardous Waste Sites," October 27, 1989 (or most recent version), and with the New York State Department of Health "Community Air Monitoring Plan."

3.11.1 CONFIRMATORY SAMPLING AND ANALYSIS

3.11.1 General

This section describes the requirements for confirmatory sampling and analysis for documenting that the remediation project's goal have been met.

3.11.2 Sampling Locations.

3.11.2.1 Soil

The Remediation Contractor shall collect and analyze samples of the following locations during the project.

- Confirmatory soil samples shall be collected from the perimeter walls of the excavations and the bottom of the excavations to confirm that the excavation criteria of 500 mg/kg of lead or 500 - 800 mg/kg have been met.
- Some soil piles will be sampled to establish whether the soil is a characteristic hazardous waste. Some soil piles will be sampled to confirm that any excavated material that is backfilled has lead levels below 500 mg/kg.
- The solidified/stabilized material shall be sampled to confirm that it meet the requirements of the off site disposal facility.
- The soil along the perimeter of the area to be covered shall be sampled to assure that the 60 mg/kg of lead remediation objective is met.
- Fill from off site facilities shall be sampled to assure that the fill is clean.

3.11.2.2 Wastewater

The Contractor shall collect samples of the wastewater resulting from all site operations, including excavation dewatering and spent washwater to ensure proper treatment and disposal.

3.11.3 Sampling and Analysis

3.11.3.1 Sample Locations, Frequency, and Types

3.11.3.1.1 Soil

The excavation limits shown in Figures should be considered as initial. Confirmatory soil samples shall be collected from the perimeters and bottoms of the excavations. Each location shall be marked with a stack that is labeled with the sample ID. Each sampling location shall be surveyed and the location logged. One sample will be collected for every 500 square feet of excavation bottom or at least one per excavation and one sample from every 200 feet of excavation perimeter or at least one per wall. These samples will be analyzed for total lead. If these samples indicate that additional contaminated soil still remains at the site then additional soil will be excavated until the confirmatory testing results indicates that all impacted soil has been excavated. The field engineer shall delineate areas of additional excavation based on the appearance of the soils. Field screening using XRF may be used (if a dependable correlation between XRF results and total results can be established) to help define the limits of addition areas to be excavated. Typically the excavation will be extended one foot deeper along a area that extends half way to the next confirmatory sampling location that passed the lead criteria.

After the soil is screened for ordnance, the Case 2 and 3 soils will be placed into temporary 200 cubic yard piles for sampling and analysis. (Case 1 soils will not be analyzed prior to solidification.) Each 200 cubic yard pile of soil will have one composite sample taken from it. Soil from four locations in the pile will be collected and mixed together. This composited sample will be sent off site for analysis at a certified laboratory. The analysis will consist of TCLP metals for the Case 2 soils while the Case 3 soils shall be tested for total lead. If the total lead analysis comes back at over 500 mg/kg the soil pile will be retested this time for TCLP metal. A fast turn around on laboratory results will be required to limit the number of temporary 200 cubic yard piles that will have to be managed. Once the laboratory results are received the 200 cubic yard soil pile can be transferred to a larger stockpile if required. The soils excavated from the areas described under Case 1 on Table 1 will not be tested, these soils will be solidified/stabilized and disposed of site.

Solidified material will have to be sampled and the samples analyzed to confirm that the disposal requirements set by the chosen off site disposal facility are met. The frequency of sampling, the type of sampling and the required physical and chemical analysis shall meet the disposal facilities requirements and all State and Federal requirements.

The soil along the perimeter of the area that will receive the 9 inch soil cover will be sampled to assure that the 60 mg/kg of lead objective is met. One grab sample will be collected at the surface every 200 feet along the perimeter of the area. These samples will be sent off site to a certified laboratory and will be analyzed for total lead. Based on the results of the analysis the area to be covered may be extended to cover areas that have soil with over 60 mg/kg of lead. These areas will be resampled to assure that the 60 mg/kg criteria is met. The field engineer shall delineate additional areas based on site conditions and the appearance of the soils. Field screening using XRF may be used (if a dependable correlation between XRF results and total results can be established) to help define the limits of addition areas to be covered. If field screening with XRF is used to define the area , the final area must still be resampled with the sample being analyzed at the off site laboratory. Typically the excavation will be extended about 10 feet along a area that extends half way to the next confirmatory sampling location that passed the lead criteria.

The fill that is brought from off site facilities shall be sampled and analyzed as described in section 3.6 of this document.

3.11.3.1.2 Wastewater

Samples of wastewater shall be collected as required by the discharge permit to ensure proper treatment and discharge of the wastewater.

3.11.3.2 Sampling Equipment Decontamination

The Contractor shall use disposable sampling equipment wherever possible to minimize decontamination requirements. When reusable equipment is used, the Contractor shall decontaminate all equipment prior to use in sampling. The decontamination procedure shall consist of successive washes in the following order:

- Potable water rinse
- Wash with laboratory grade detergent (Alconox or equivalent)
- Distilled water rinse
- Methanol rinse
- Hexane rinse
- Distilled water rinse

If samples are to be analyzed for metals, a nitric acid rinse and an additional distilled water rinse will be added between steps 3 and 4. All decontamination wastes shall be disposed of off-site as hazardous waste.

3.11.3.3 Sample Volumes, Containers, and Preservation

The Contractor shall ensure that all sample containers, preservation, packaging, and holding times are in accordance with EPA Region 2 and NYSDEC protocols. All samples collected shall be properly logged, labeled, packaged, and stored in an iced cooler immediately after collection and until arrival at the laboratory. All samples will be accompanied by a completed chain-of-custody form which can be used to document sample custody.

3.11.3.4 Laboratory Analyses

Soil samples shall be analyzed for total lead using NYSDEC Analytical Services Protocol. Soil samples shall be analyzed for toxicity characteristic metals by TCLP using EPA SW-846 Method 1311. Every tenth soil sample that is tested for TCLP metals will be analyzed for the complete toxicity characteristic by TCLP. The Contractor shall ensure that the laboratory is capable of providing reporting limits below the soil cleanup levels so that reported non-detect values may be compared to the cleanup levels. The Contractor shall ensure that the selected laboratory has been approved by NYSDEC and the Corps of Engineers.

3.12 DISPOSAL REQUIREMENTS

3.12.1 <u>General</u>

3.12.1.1 This section describes the disposal requirements for all soils, wastewater, treatment residue, and treatment residuals generated as part of this removal action.

3.12.1.2 The Contractor shall comply with all applicable federal, state, and local regulations. At a minimum, the Contractor shall identify and comply with all hazardous and solid waste, and transportation requirements.

3.12.1.3 The Contractor shall be responsible for determining whether the waste residuals generated from the treatment processes are hazardous wastes. Wastes include any waste oils or lubricants, hydraulic fluids, coolants, plastic sheeting, used personnel protection equipment and other miscellaneous debris.

3.12.1.4 The Contractor shall ensure that all transport of waste is conducted in accordance with DOT regulations.

3.12.1.5 The Contractor shall obtain approval from the Army of all off site disposal facilities that will receive wastes from this site.

3.12.2 <u>Soil</u>

Soils excavated by EODT and screened for ordnance removal that are not identified on figures 6 - 13 as soil with lead levels over 500 mg/kg shall be tested for total lead and if the lead levels are below 500 mg/kg these soils will be used as backfill at the excavation. If the lead level is above 500 mg/kg than the soil will be tested for TCLP metals and then based on the test results either disposed off site as a non-hazardous waste or solidified/stabilized prior to disposal off site at an approved disposal facility.

All soils excavated from areas identified as Case 1 shall be solidified/stabilized and disposed off site at an approved disposal facility.

All soils excavated from areas identified as Case 2 soils shall be tested for TCLP metals. Based on the results of the analysis the soil will either be disposed off site as a non-hazardous waste or the soils will be solidified/stabilized and disposed off site. None of these soils will be used as backfill into the excavations.

3.12.3 <u>Water</u>

Following treatment of wastewater, the Remediation Contractor shall discharge all treated waters from this removal action including groundwater to a nearby drainage ditch. The Remediation Contractor shall include in the site plans all specific testing requirements for this discharge permit, and shall be responsible for meeting these testing requirements.

3.13 SOIL COVER

3.13.1 General

One of the primary objectives of the remediation project is to cover the areas that have lead over 60 mg/kg with a 9 inch soil cover. The total area that will receive the soil cover is presently estimated at 30 acres. This area could increase depending on the results of the planned confirmatory sampling along the perimeter of the area to be covered.

3.13.2 Soil Cover Layout

The perimeter of the area that will receive the 9 inch soil cover shall be staked out by the remediation contractor. The layout shall be based on the area shown on the Final Grading Plan. After the perimeter of the area has been staked out the confirmatory soil samples will be collected along the perimeter of the staked out area. Based on the results of the confirmatory sampling the area that is staked out may be expanded to cover areas that did not meet the 60 mg/kg remediation criteria. Additional confirmatory sampling along the perimeter of any area that is expanded will be required. Once all the confirmatory sampling is completed and the perimeter of the area that will receive the 9 inch soil cover is defined and agreed upon, then the installation of the soil cover can begin.

3.13.3 Clearing

Prior to installing the 9 inch soil cover the remediation contractor shall mow all areas so that the grass is 1 inches tall prior to placing the soil cover. In addition any small diameter trees (2 inches or smaller) or brush in the area that is going to receive the soil cover shall be cut and chipped. The chipped material may be used as mulch on the areas prior to placing the 9 inch soil cover. Large diameter trees (over 2 inches in diameter) that are located within the area that receives the soil cover shall not be cut down. These trees shall be protected during the installation of the soil cover.

3.13.4 Backfilling

Each excavation will be backfilled to meet the existing grade around the perimeter of the excavation prior to starting the rough grading or final grading for the soil cover. Refer to section 3.5 of this document for details on excavation and backfillling.

3.13.5 Grading

Prior to installing the 9 inch soil cover, the site shall be graded. Rough grading shall be limited to that required to implement the final cover details as shown on figure 27 or as required to spread any excess material that has less than 500 mg/kg. The site shall be graded to balance the cut and fill from the site. Off site material should not be used to complete the rough grading plan. The rough grading plan shall be reviewed once the final DOD UXO clearance criteria are established to assure that the grading plan meets that DOD UXO clearance criteria. The Contractor shall also grade the site to minimize erosion during the revegetation period. Any drainage ditches or swales that may be subject to erosion should be protected with rip rap. Once the rough grading is finished the 9 inch soil cover can be installed. The cover shall consist of five inches of clean fill and four inches of topsoil.

3.13.6 Revegetation

The Contractor shall revegetate the soil cover as soon as possible to minimize the potential for erosion. The Contractor shall also revegetate all work areas in which site work has killed off the vegetation.

3.13.7 Materials

3.13.7.1 Fill

Satisfactory materials for use as fill shall be materials classified in ASTM D 2487 as GW, GM, GC, SW, SM, SC and shall be free from roots and other organic matter, trash, debris, frozen materials, and stones larger than 3 inches in any dimension. Any material classified as SM shall have not more than 25 percent by weight passing the No. 200 sieve.

All off site fill shall be sampled and analyzed as described in section 3.6 of this document to assure that none of the fill that is used is contaminated.

3.13.7.2 Topsoil

Topsoil shall be fertile, natural friable, silty soil, with characteristics of typical soil in the vicinity which produces heavy crops, grass and other vegetation, obtained from naturally well-drained areas. The topsoil shall be reasonably free from subsoil, weeds and other vegetation and from clay lumps or stones. Soil shall have a pH between 5.5 to 7.6. The Contractor shall have representative topsoil samples test by a soil-test chemist and a copy of the test and recommendations for additives shall be furnished to the site representative prior to commencing work. Quantity given for the following materials used for conditioning and seeding will be adjusted as required by the soil chemist recommendations.

All topsoil shall be sampled and analyzed as described in section 3.6 of this document to assure that none of the topsoil that is used is contaminated.

3.13.7.3 Limestone

Limestone shall consist of ground calcareous or dolomitic limestone, 95% to pass a No. 20 sieve and at least 50% to pass a No. 100 sieve. Limestone shall conform to the standards of the American Association of Analytical Chemists, and be marked in accordance with the appropriate Federal and state laws relating to commercial fertilizers.

3.13.7.4 Fertilizer

Fertilizer shall be applied in granular dry form and shall be a slow-release type product specifically designed for starting grass seed. The chemical analysis shall be (approximately) 15-10-10 applied at the rate designated by the soil-test chemist. The fertilizer shall conform to the requirements of the appropriate Federal and sate laws relating to commercial fertilizers, and be delivered dry in original, unopened containers bearing the manufacturer's guaranteed analysis.

3.13.7.5 Grass Seed

Grass seed shall meet the requirements of the appropriate state and Federal agricultural and vegetable seed laws. Grass seed shall contain Kentucky Blue, Red Top, Fescue and Creeping Bent. Alternate types of permanent seed mixtures of equal quality may be used, if in the opinion of the Contractor's soil-chemist they are more suitable to the local climate and intended land use (i.,e. wilderness area). Weeds and inert material shall not exceed 2%.

3.13.7.6 Aggregate Surface Course

Aggregate shall consist of clean, sound, durable particles of natural gravel, crushed gravel, crushed stone, sand, slag, or other approved materials processed and blended or naturally combined. Aggregates shall be free from lumps and balls of clay, organic matter, objectionable coatings, and other foreign materials. The aggregate shall be place in layers not to exceed 6 inches and each layer shall be compacted with a roller or mechanical tamper approved by the contracting officer. The water content during the compaction shall be maintained at optimum or at a percentage specified by the contracting officer. The access road to the existing burn tray and the OD Grounds will require a cover of 9 inches in areas as shown on the grading plan. The portion of the rod requiring the new cover may change based on the laboratory results from the confirmatory sampling at the edge of the cover. The new road surface shall be constructed in accordance with Guide Specification 02546 entitled "Aggregate Surface Course" as presented in Appendix I.

3.13.8 Application

3.13.8.1 Topsoil

The areas that will receive the topsoil shall be rough graded to the appropriate required sub-grades and shall be maintained in a true and even condition. Finish grading shall include any necessary repairs to previously rough graded areas. Immediately prior to dumping and spreading the topsoil, the sub-grade, wherever compacted by traffic or other causes, shall be loosened by disking or scarifying to a depth of at least two inches to permit bonding of the topsoil to the sub-grade. Topsoil shall be spread evenly to a compacted thickness of 4 inches over all required areas and shall be rolled and raked until it is clean and free from irregularities, and is at the finished grades. Topsoil shall not be placed on frozen, excessively wet or dry sub-grade.

3.13.8.2 Fertilizer and Limestone

After the topsoil has been spread to the required thickness, ground limestone shall be distributed uniformly over the topsoil at a rate of 5 pounds per 100 square feet. After disking in of the ground limestone, fertilizer shall be spread at a rate of 2 pounds per 100 square feet or as recommended by the soil chemist. Subsequent to liming and fertilization, the topsoil areas shall be scarified by disking in two directions at right angles to each other, or by other approved methods, in such a manner that the topsoil will be thoroughly incorporated into the top two inches of the subgrade. Prior to seeding, the surface of the topsoil shall be raked free of all stones and other objectionable material.

3.13.8.3 Grass Seed

No seeding shall be done during windy weather or when the ground is frozen, wet or otherwise non-tillable. The acceptable planting seasons for this area is April 15 to June 15 and August 15 to October 15, all work shall be scheduled so that the seeding of the areas takes place within these planting seasons. Any areas not seeded during the planting season shall have temporary erosion and sediment controls in place such as fast growing annual grass, silt fences or mulch to protect the site until the next planting season. Prior to seeding the following planting season these areas will be inspected, regraded and prepared as required to make them ready for seeding. As soon as the seed is sown, it shall be thoroughly covered with a thin layer of topsoil by raking, harrowing or dragging. The areas shall be uniformly seeded using not less than 4 pounds per 100 square yards of area. The seed shall be raked in lightly and rolled with a light roller.

3.13.9 Maintenance

Seeded areas shall be protected and maintained by watering, and replanting as necessary for at least 30 days and as much longer as is necessary to establish a uniform stand of the specified grasses and until acceptance. The Contractor shall be responsible for the watering of all seeded areas which shall be kept moist. The Army's representative's decision will prevail in the event a dispute develops with the Contractor as to whether or not the seeded and grassed areas are moist. Seeded areas on which growth has started shall be watered to a minimum depth of two inches to assure continuing growth. Watering shall be done in a manner which will provide uniform coverage, prevent erosion and prevent damage to the finished surface by the watering equipment. The Contractor shall furnish sufficient watering equipment. The Contractor shall maintain the field areas until they are judged by the Army's representative to be at least 95% satisfactory.

3.14 WETLANDS REPLACEMENT

3.14.1 General

The RI identified numerous poorly drained areas at the OB Grounds that were identified as wetlands. All of these areas are relatively small and were created as a result of the earthwork done when the burning pads were built. None of the identified wetlands on the OB Grounds meet the New York State criteria for wetlands therefore these areas are not considered wetlands by the State of New York and indeed none of these areas are included on the State's wetland maps. The COE out of Buffalo will evaluate the existing areas and make a determination as to whether these areas should be dealt with as wetlands and whether wetland replacement will be required. The following specifications for wetland replacement shall apply if the COE (or the EPA) determines that wetlands replacement does apply to these areas.

The existing wetlands that will be covered by the new soil cover are shown on figure 23. These wetlands are classified as emergent wetlands. The size of the new wetland is based on a one for one replacement of the wetlands that are disturbed by this project. Based on this criteria the total area of the new wetlands is estimated at about 2.5 acres.

3.14.2 Layout

The layout for the new wetland shall be in accordance with the drawings. The goal of the layout is to set the finished grade of the new wetland at an elevation equal to the invert of the existing culvert that drains the OB Grounds area to Reeder Creek. The drainage from the OB Grounds area will be directed through the new wetland and then through the existing culvert to Reeder Creek.

3.14.3 Excavation, Grading and Compaction

The new wetland area shall be excavated to the required grades as shown on the drawings. The new wetland area will be excavated to an elevation that is one foot below the invert of the existing culvert so that when the area is filled with one foot of topsoil the finished grade of the wetland will equal the invert of the culvert. All fill material shall be compacted with earth moving equipment or approved alternative method. Graded areas shall be uniform and smooth, free from rock, debris, or irregular surface changes. Finished grade in the new wetlands shall not be more than 0.1 feet above or below the established finished grade. The material that is excavated from the new wetlands area shall be stockpiled tested and used as fill in the burn pad excavations if the lead levels are below 500 mg/kg.

All material backfilled into the excavation shall be place in 12 inch lifts. The material shall not be excessively wet or dry at the time of placement, such that in the opinion of the construction manager adequate compaction would be prevented. Each layer shall be compacted by a minimum of four passes of a rubber tire roller or other compaction equipment approved by the construction manager.

3.14.4 Fill

Once the new wetland has been excavated to the required subgrade the wetland shall be filled with one foot of topsoil. The topsoil shall be natural, friable, fine, loamy, soil possessing at least 5 percent organic matter, free from subsoil, objectionable weeds, litter, sod, stiff clay, stones larger than 2 inches in diameter, stumps, roots, trash , toxic substances, or any other material that may be harmful to plant growth or hinder planting operations.

3.14.5 Plants and Seeding

The new wetland shall be seeded with Northern Wetland Grass Mix as produced by Southern Tier Consulting or approved equal. The area shall be prepared and seed shall be applied per the manufacturer's directions. The specifications for the seed shall be submitted for review and approval prior to purchasing the seed. All seeding must be completed by September 15 so that the plants in the new wetlands have a full growing season to get established.

3.14.6 Mulching

After seeding all areas shall be covered with straw mulch at a rate of 120 bales per acre or cover with some other acceptable erosion control material..

3.14.7 Maintenance

The contractor shall water the areas in the new wetlands as required to sustain growth through the first growing season. If necessary the contractor shall draw down the water level in the wetlands during the first growing season while the seeds germinate, take root and became established.

3.15 SEDIMENT REMOVAL

3.15.1 General

The two areas in Reeder Creek adjacent to Open Burning Grounds as identified on figures 12 and 13 are scheduled for sediment removal under this remediation project. The areas of sediment that are to be excavated are defined on figures 12 and 13. The sediment in these areas will be excavated to a maximum depth of one foot or to bedrock which ever is less. The contractors scope of work for the sediment removal includes the following tasks.

- Clearing access ways to the stream
- Diverting the flow in Reeder Creek
- Dewatering the stream bed
- Excavating sediments
- Dewatering excavated sediments

- Stockpiling sediments
- Testing sediments
- Disposing of the sediments
- Stabilizing disturbed areas along the stream banks
- Treatment and disposal of water collected from the dewatering of the stream bed and sediments

3.15.2 Clearing Access Ways to the Stream

The contractor shall be responsible for clearing access ways to the stream as required to suit the equipment that the contractor uses to complete the sediment removal in Reeder Creek. In some areas along the stream there are shrubs and trees that may impact the contractors access to portions of the stream.

3.15.3 Diverting the Flow in Reeder Creek

The contractor shall be responsible for diverting the flow in Reeder Creek around the areas that are scheduled to have sediments removed. Flow rates and stream cross sections are presented in section 1 of this document. The contractor shall provide a detailed description of the proposed stream diversion system as part of the required work plan for this project.

3.15.4 Dewatering the Stream Bed

The contractor shall be responsible for dewatering the stream bed after the stream flow has been diverted. The water pumped from the isolated sections of the stream bed shall be treated as required to meet applicable water quality discharge requirements before it is discharged to Reeder Creek. The contractors work plan shall describe the water treatment system to be used during the dewatering of the stream bed. Sampling and analysis of the water pumped from the stream bed, if required by any discharge permits, shall also be the responsibility of the contractor.

3.15.5 Excavating Sediments

The contractor shall excavate a maximum of one foot of sediments or down to bed rock which ever is less. The sediment excavation shall extend across the creek to the toe of slope of the stream's banks. A description of the stream bed is included in section 1 of this document. The contractor's work plan shall describe the equipment and methods that will be used to remove the sediments from these areas. No confirmatory sampling of sediments is planned. The status of the work will be monitored by first surveying the stream bed to establish the existing elevations and then resurveying the completed area to document that either bed rock was reached or that a foot of sediment was removed. The contractor shall be responsible for performing the required surveys prior to and after the sediment is removed. Grade stakes shall be used as required to control the amount of sediments excavated. Cross sections at every 100 feet shall be made before and after the excavation to document the amount of sediments excavated along with a centerline profile of the stream with survey points taken every 10 feet.

3.15.6 Dewatering of Excavated Sediments

Sediments that are excavated may need to be dewatered before the sediments are placed into stockpiles. The contractors workplan shall describe how the excavated sediments will be dewatered and how the water that is collected is treated and disposed.

3.15.7 Stockpiling Sediments

The excavated sediments shall be placed in 200 cubic yard stockpiled The sediment stockpile shall be managed in the same manner as the Case 2 soil stockpiles. The sediment stockpiles shall be sampled and tested for TCLP metals.

3.15.8 Disposing of Sediments

The sediments will not be used as backfill at the site. The sediments will be disposed of off site based on the results of the TCLP analysis. Sediments that do not exceed the TCLP limits will be disposed of as a non-hazardous waste. Sediments that exceed the TCLP limits would be solidified/stabilized and then disposed of off site. Based on existing sampling results it is not anticipated that any sediments will exceed the TCLP limits.

3.15.9 Stabilizing disturbed Areas Along the Stream Banks

Areas along the stream bank that are disturbed by the contractor shall be stabilized to prevent erosion. The type of stabilization used in the different parts of the stream bank shall be selected to assure that potential for erosion from disturbed areas is minimized. The type of stabilization could include riprap, geotextiles, seeding and mulching, or other types of stabilization techniques. The contractor's work plan shall describe the type of stabilization to be used in each area that is disturbed along Reeder Creek during the sediment removal operation.

3.15.10 Treatment and Disposal of Water

The contractor is responsible for obtaining all permits required to perform the work including any wastewater discharge permits required for the discharge of the water pumped from the stream when it is being dewatered or wastewater collected when the excavated sediments are dewatered. The contractor will be responsible for providing any required treatment system to meet the discharge limits set on those permits. In addition the contractor shall be responsible for any required wastewater discharge sampling, analysis and reporting that may be required by those permits.

3.16 MONITORING WELLS

Seven new groundwater monitoring well shall be installed by the contractor after the soil cover is installed. The OB Grounds has a groundwater divide where the groundwater flows both to the east and west. Therefore the upgradient well will be located at the groundwater divide however it will be located to the south of the OB Grounds so that the "upgradient" well will not be impacted by the site. In addition six down gradient wells will be provided with three being located at the eastern edge of the site and three being located at the western edge of the site. The wells shall be used as the long term groundwater monitoring well that are required for the site. The existing well are constructed with PVC materials which do not meet the requirements of final monitoring well which require stainless steel material. Therefore the new well will be installed using the same specifications that were used for the existing well at the site except that the wells shall be constructed of stainless steel materials instead of PVC. Appendix H presents the installation specification for the new monitoring wells.

The contractor shall also be responsible for the decommissioning of the following existing monitoring wells at the site. The decommissioning of the existing wells may be done either after EODT has completed the UXO clearance or if required during the UXO clearance. The scheduling of this activity should be closely coordinated with EODT. The wells shall be decommissioned in accordance with the Groundwater Monitoring Well Decommissioning Procedures as presented in Appendix C. The preferred method is to pull the casings. The wells have PVC casings and range in depth from 5 feet to 16 feet. Three of the wells are 4 inch wells while the remainder are two inch wells.

Well to be Decommissioned

MW-1

MW-5

MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
MW-15
MW-16
MW-17
MW-18
MW-19
MW-21
MW-22
MW-23
MW-24
MW-25
MW-26
MW-27
MW-28
MW-29
MW-30
MW-31
MW-32
MW-36
MW-37
MW-38
MW-39
MW-40
MW-41

The following existing wells shall not be decommissioned; MW-12, MW-13, MW-14 and MW-27. These wells are the active RCRA monitoring wells for the existing open burning tray. These wells shall not be decommissioned without the written authorization of the owner.

3.17 DEMOBILIZATION

3.17.1 Demobilization

Following completion and acceptance of the work by the Contracting Officer, the Contractor shall provide all Contractor and subcontractor labor and materials required to decontaminate, dismantle, package, and transport from the site all Contractor or subcontractor equipment, materials, and personnel. Demobilization will not be complete until site restoration is complete.

3.17.2 Removal

At the completion of the removal action the Contractor shall remove all temporary facilities, utility services, and debris, unless otherwise directed by the Army's representative. The Contractor shall restore the area in accordance with these specifications.

3.17.3 Site Restoration

The Contractor shall restore the sites to their original condition except as described in these specifications or as directed by the Army.

3.18 DOCUMENTATION/RECORDKEEPING

3.18.1 Daily Logs

The Contractor shall maintain daily logs that include the quantities of the soil excavated and treated the previous day and copies of all analytical data received the previous day. The daily logs will also include any air monitoring results obtained the previous day and the volume of water treated the previous day.

3.18.2 Weekly Reports

The Contractor shall submit weekly reports each Monday morning to the Contracting Officer or his representatives. The weekly reports shall summarize the daily logs from the previous week, and address administrative issues. Topics which should be included in the weekly report are:

- Any problems which arose the previous week, and the resolutions

- Documentation of health and safety meetings
- Health and safety issues
- Site visitor logs

The requirements for the final report are presented in Appendix D and Appendix E.

3.18.3 Final Report

Each contractor shall submit a final report to the Contracting Officer or his representatives within 30 days of demobilization. The remediation contractor's report shall summarize all the daily logs and weekly reports, and provide tabular summaries of all data collected during the removal action. The final report shall include copies of all analytical data, visitor logs, air monitoring data, shipping forms, manifests, and description of all problems and problem resolutions. The final report shall include a drawing which shows the extent of the excavations and clearly indicates the locations of all samples collected to verify the extent of the excavation. The requirements for the final report is presented in Appendix D and Appendix E.

3.19 PERFORMANCE SCHEDULE

3.19.1 The Contractor shall complete each of the project tasks within the time frame presented in the Contract Data Requirements List, shown in Appendix D.

3.20 DELIVERABLE DATA

3.20.1 The Contractor shall prepare and submit a SAP in accordance with EM 200-1-3 and DD Forms 1423 and 1664-1.

3.20.2 The Contractor shall prepare and submit a written certification of the HSP in accordance with DD Forms 1423 and 1664-1.

3.20.3 The Contractor shall prepare and submit an SSHP in accordance with DD Forms 1423 and 1664-1.

3.20.4 The Contractor shall prepare and submit a Work Plan in accordance with DD Forms 1423 and 1664-1.

3.20.5 The Contractor shall prepare and submit weekly progress reports in accordance with DD Forms 1423 and 1664-1.

3.20.6 The Contractor shall prepare and submit a Final Report at the conclusion of project in accordance with DD Forms 1423 and 1664-1.

3.20.7 The Contractor shall submit all deliverable data to the Contracting Officer or his representatives. The Contracting Officer or his representatives will review the submissions to determine whether they meet the minimum contract requirements and will accept or reject them accordingly. The Contractor shall correct the deficiencies of the rejected deliverables and resubmit them within 30 days of rejection. The Contracting Officer's acceptance of any submittal does not constitute or imply approval or endorsement, and in no way relieves the Contractor of his responsibility to meet all the requirements of this document.

3.21 ADDRESSES

3.21.1 Deliverables shall be distributed to the following addresses in the quantities shown.

U.S. Army Engineering and Support Center, Huntsville ATTN.: CEHND-PM-EP (Ms. Allen) 4820 University Square Huntsville, AL 35816	Quantity = 4
Commander USACHPPM (PROV) ATTN: MCHB-ME-R (Mr. Hoddinott) Building E1677 Aberdeen Proving Grounds, MD21010-5422	Quantity = 8
Commander U.S. Army Environmental Center, ATTN: Mr. Waugh Aberdeen Proving Grounds, MD 2101-5401	Quantity = 3
Commander Seneca Army Depot Activity ATTN: BEC (MR. Absolom) Romulus, New York 14541	Quantity = 10
Commander U.S. Army Corps of Engineers, New York District Attn.: Mr. Battaglia Romulus, New York, 14541	Quantity = 3

3.22 REFERENCES

U.S. Army Corps of Engineers, Huntsville Division, Manual No. HNDM 1110-1-1, Design Manual for Architect-Engineer, August 1986.

Engineering-Science, Inc., "Solid Waste Management Unit Classification Report", September, 1994.

Engineering-Science, Inc., "Draft Expanded Site Inspection Seven High Priority SWMUs" June 1994.

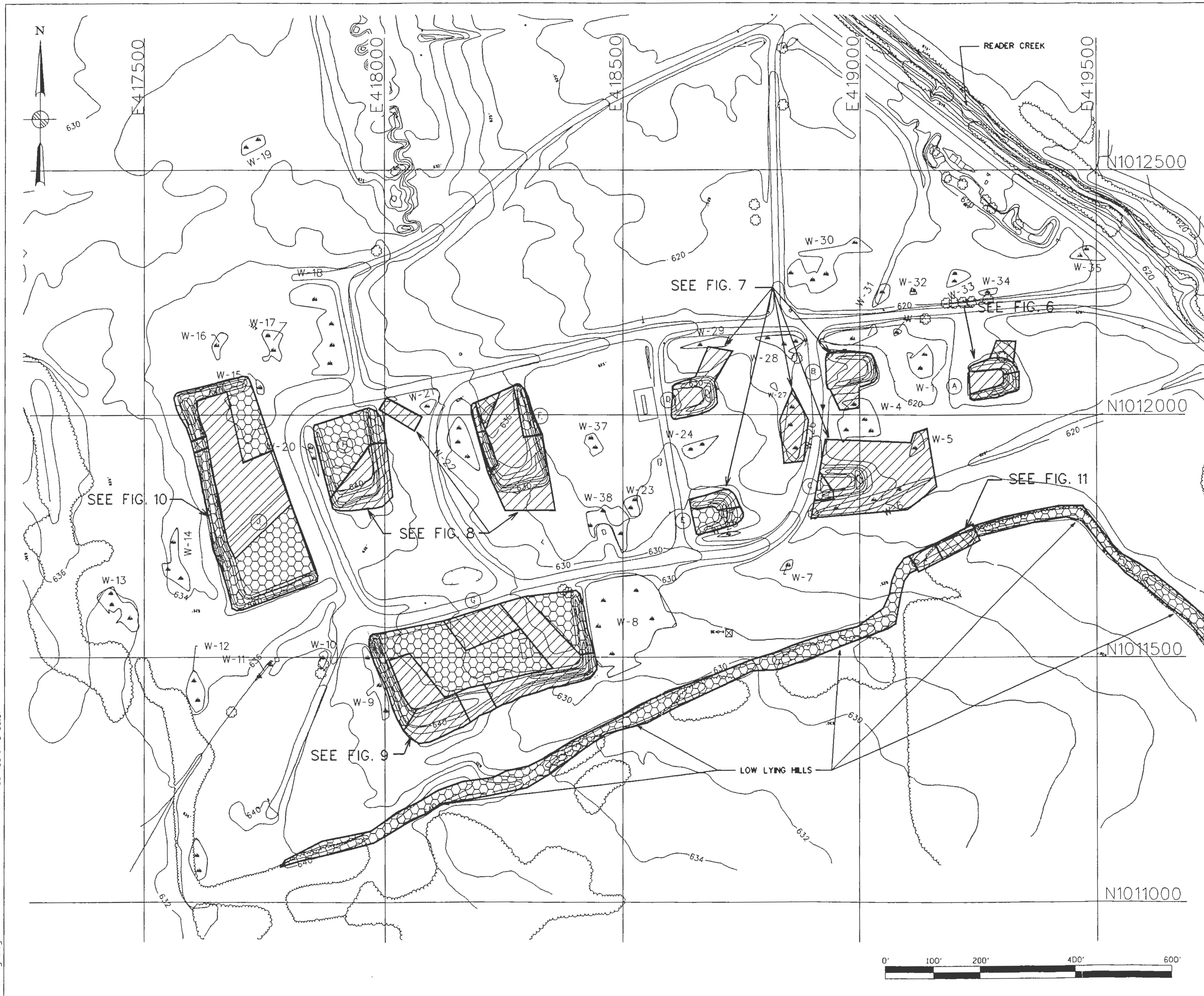
United States Army Environmental Hygiene Agency (USAEHA), 1987, Evaluation of Solid Waste Management Units, Seneca Army Depot, Interim Final Report, Groundwater Contamination Survey, No. 38-26-0868-88.

United States Army Toxic and Hazardous Materials Agency (USATHAMA), 1980, Installation Assessment of Seneca Army Depot, Report No. 157, AMXTH-IR-A-157, January 1980.

Engineering-Science, Inc., “Remedial Investigation Report at the Open Burning (OB) Grounds”, September 1994

Engineering Science, Inc., “ Feasibility Study Report at the Open Burning (OB) Grounds”, March 1996

EOD Technology, Inc., “ Work Plan for Ordnance and Explosives Removal Action”, November 1997



LEGEND:

- Ⓖ BURNING PAD DESIGNATION
- GROUND CONTOUR AND ELEVATION
- UTILITY POLE
- TREE
- BRUSH
- CASE 1 LEAD > 800ppm
- CASE 2 LEAD > 500ppm < 800ppm
- CASE 3 LEAD < 500ppm

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PARSONS

PARSONS ENGINEERING SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	

FIGURE 3
LOCATION OF SOIL TO BE EXCAVATED
(GREATER THAN 500mg/kg LEAD)

SCALE	DATE	REV
1"=200'	AUGUST 3, 1998	A

LEGEND:

TRANSECT F — TRANSECT

SW-140 — SURFACE WATER/SEDIMENT SAMPLE & DESIGNATION

(G) — BURNING PAD DESIGNATION

650 — GROUND CONTOUR AND ELEVATION

WETLAND

UTILITY POLE

TREE

BRUSH

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SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 4

LOCATION OF SOIL & SEDIMENT GREATER THEN 500mg/kg LEAD TO BE EXCVAVTED AT REMOTE AREAS

SCALE 1"=500' | DATE AUGUST 3, 1998 | REV A

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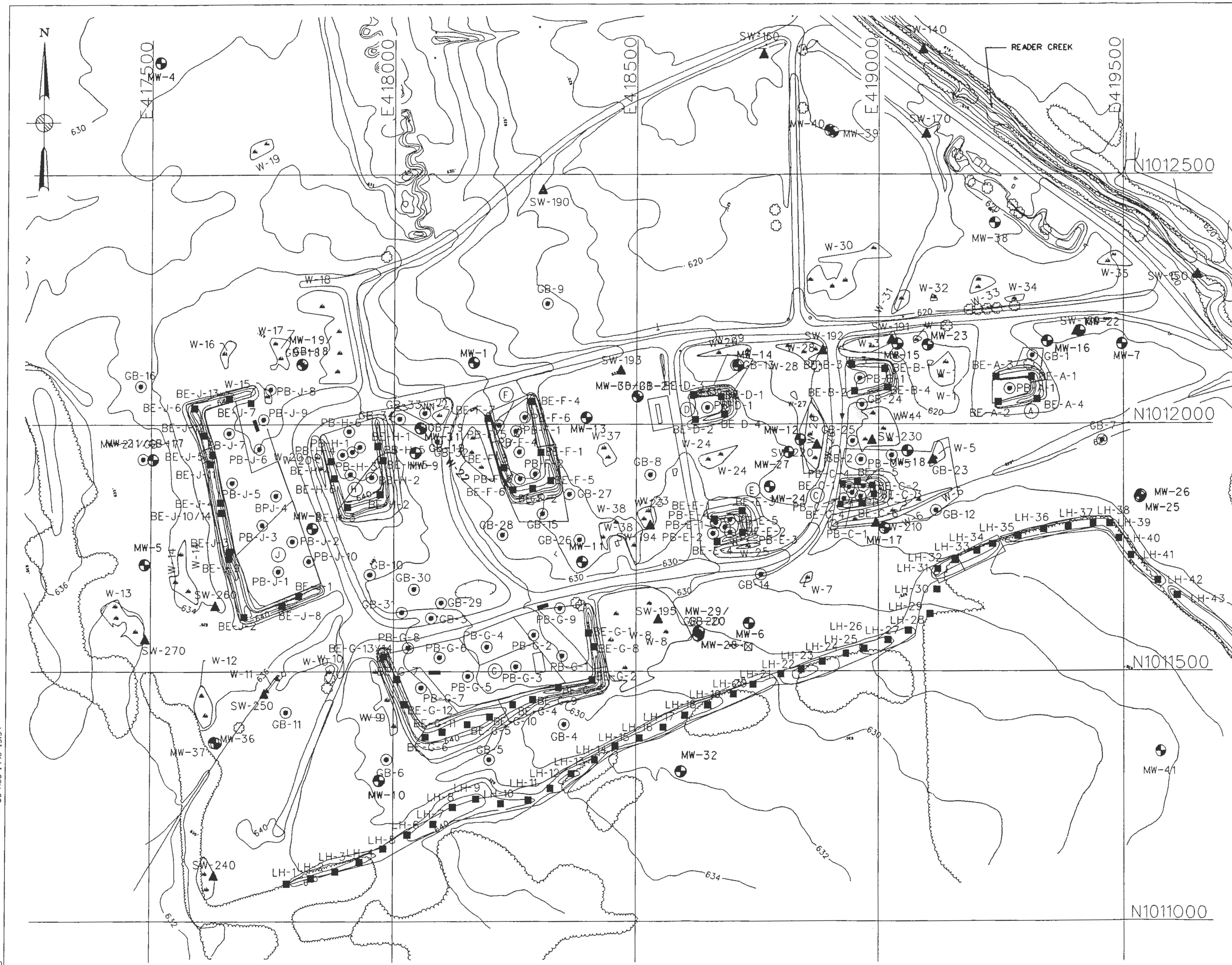

LEGEND:

- MW-41 — MONITORING WELL
- (G) — BURNING PAD DESIGNATION
- BE-G-1 — BERM EXCAVATION & DESIGNATION
- PB-G-1 GB-2 — PAD OR GRID BORING DESIGNATION
- GAE-G-2 — GEOPHYSICAL ANOMOLY EXCAVATION & DESIGNATION
- 650 — GROUND CONTOUR AND ELEVATION
- W-1 — WETLAND & DESIGNATION
- UTILITY POLE
- TREE
- BRUSH
- SW-210 — SURFACE WATER/SEDIMENT SAMPLE & DESIGNATION

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SENECA ARMY DEPOT ACTIVITY

SECTION C-REMEDIAL DESIGN

OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING

Dwg. No.

FIGURE 5

OB GROUND RI

SAMPLING LOCATIONS

SCALE 1"=200'

DATE AUGUST 3, 1998

REV A

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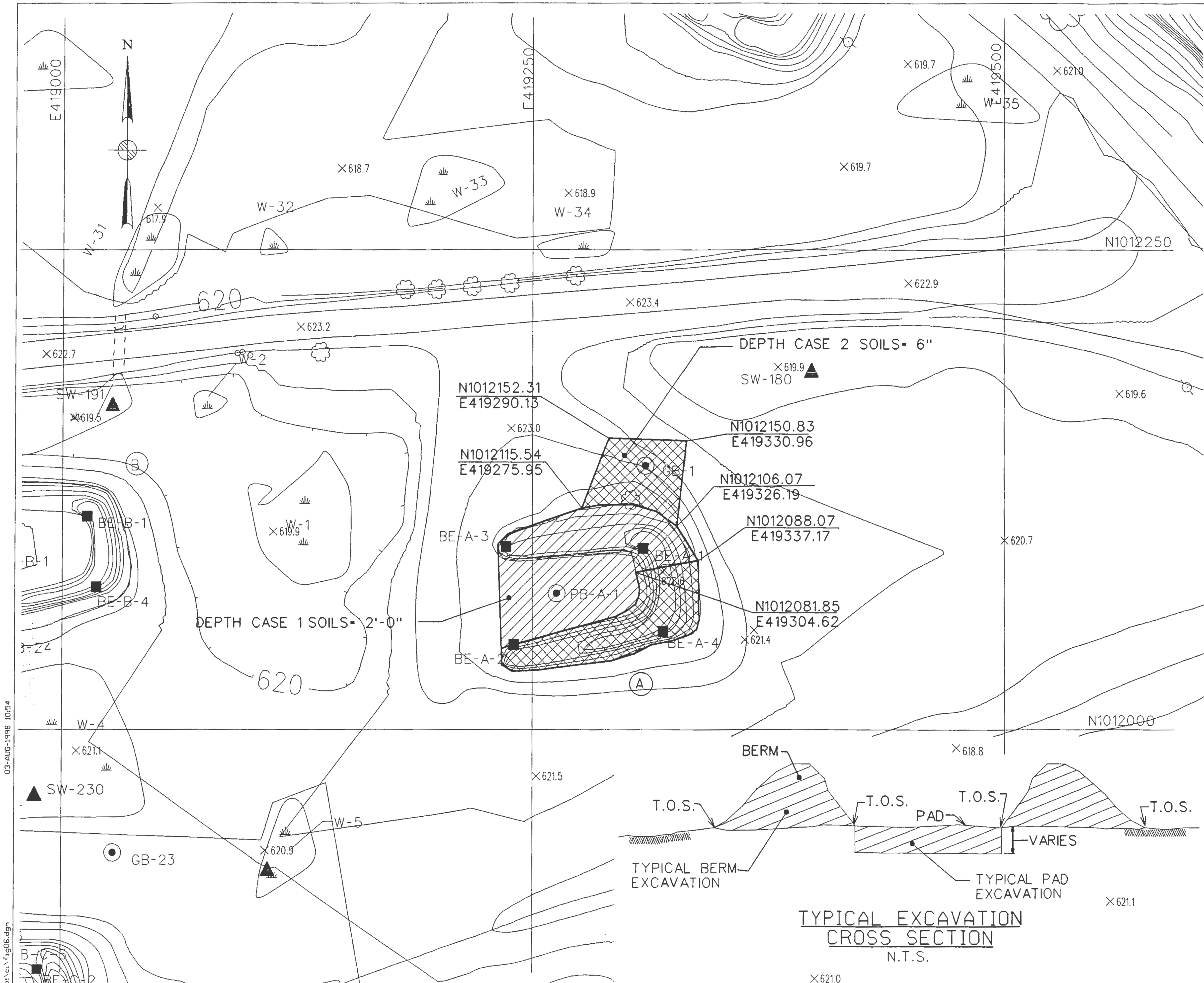

LEGEND:

(G)	BURNING PAD DESIGNATION
BE-G-1	BERM EXCAVATION & DESIGNATION
PB-G-1 GB-2	PAD OR GRID BORING DESIGNATION
GAE-G-2	GEOPHYSICAL ANOMOLY EXCAVATION & DESIGNATION
650	GROUND CONTOUR AND ELEVATION
W-1	WETLAND & DESIGNATION
	UTILITY POLE
	TREE
	BRUSH
SW-210	SURFACE WATER/SEDIMENT SAMPLE & DESIGNATION
	CASE 1 LEAD > 800ppm
	CASE 2 LEAD > 500ppm < 800ppm
	CASE 3 LEAD < 500ppm

0' 25' 50' 100'

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SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

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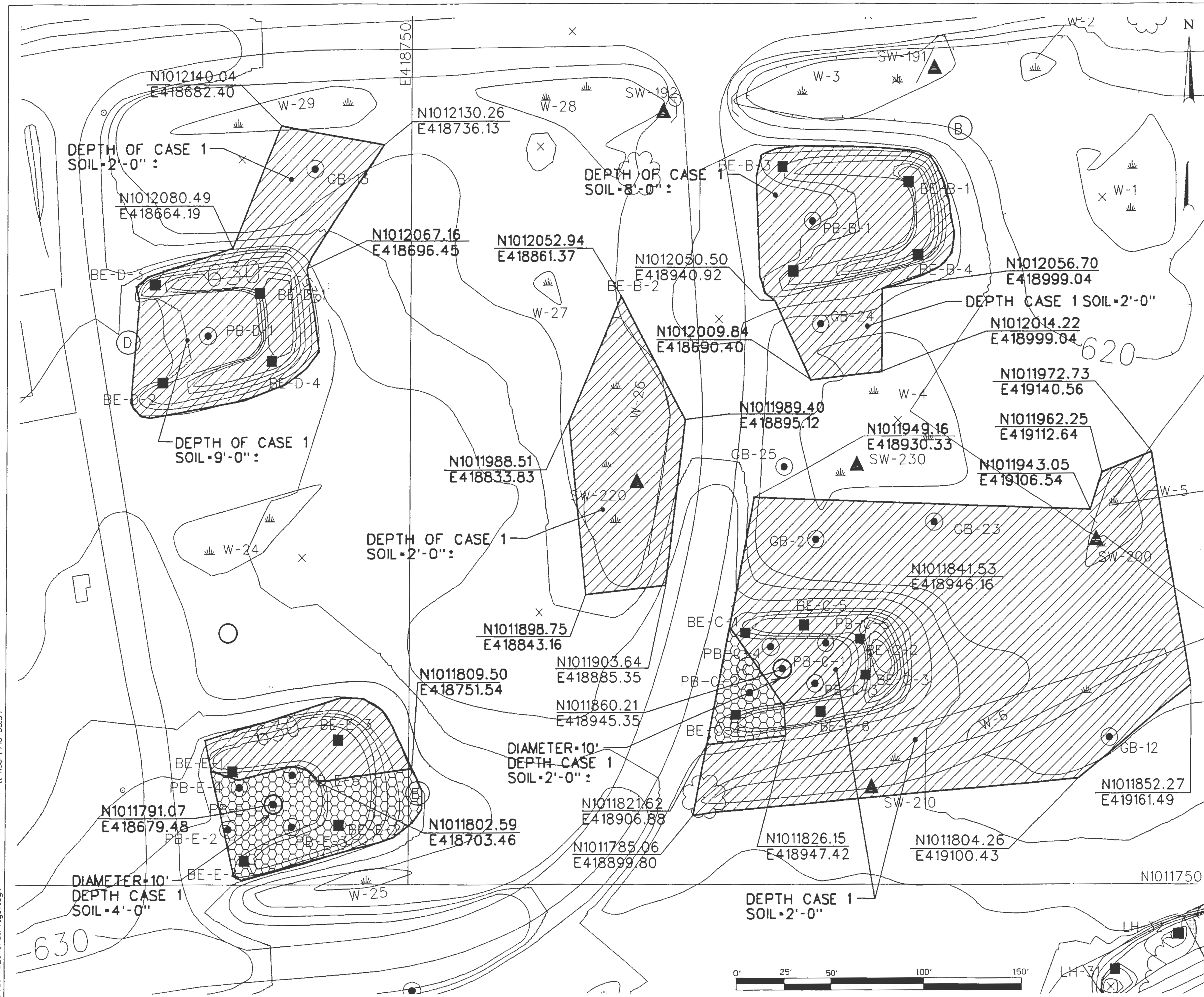
FIGURE 6
SEAD 23-BURN PAD A
LIMITS OF SOIL WITH LEAD
OVER 500mg/kg

SCALE 1"=50' | DATE AUGUST 3, 1998 | REV A



LEGEND:

G	BURNING PAD DESIGNATION
BE-G-1	BERM EXCAVATION & DESIGNATION
PB-G-1 GB-2	PAD OR GRID BORING DESIGNATION
GAE-G-2	GEOPHYSICAL ANOMOLY EXCAVATION & DESIGNATION
650	GROUND CONTOUR AND ELEVATION
W-1	WETLAND & DESIGNATION
	UTILITY POLE
	TREE
	BRUSH
SW-210	SURFACE WATER/SEDIMENT SAMPLE & DESIGNATION
	CASE 1 LEAD > 800ppm
	CASE 2 LEAD > 500ppm < 800ppm
	CASE 3 LEAD < 500ppm

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SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

DEPT.	Dwg. No.
ENVIROMENTAL ENGINEERING	

FIGURE 7

LIMITS OF SOIL WITH LEAD OVER 500mg/kg

SCALE	DATE	REV
1"-50'	AUGUST 3, 1998	A

LEGEND:

G	BURNING PAD DESIGNATION
BE-G-1	BERM EXCAVATION & DESIGNATION
PB-G-1 GB-2	PAD OR GRID BORING DESIGNATION
GAE-G-2	GEOPHYSICAL ANOMOLY EXCAVATION & DESIGNATION
650	GROUND CONTOUR AND ELEVATION
W-1	WETLAND & DESIGNATION
	UTILITY POLE
	TREE
	BRUSH
SW-210	SURFACE WATER/SEDIMENT SAMPLE & DESIGNATION
	CASE 1 LEAD > 800ppm
	CASE 2 LEAD > 500ppm < 800ppm
	CASE 3 LEAD < 500ppm

PARSONS

PARSONS ENGINEERING SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 8

LIMITS OF SOIL WITH LEAD OVER 500mg/kg

SCALE 1"=50' | DATE AUGUST 3, 1998 | REV A

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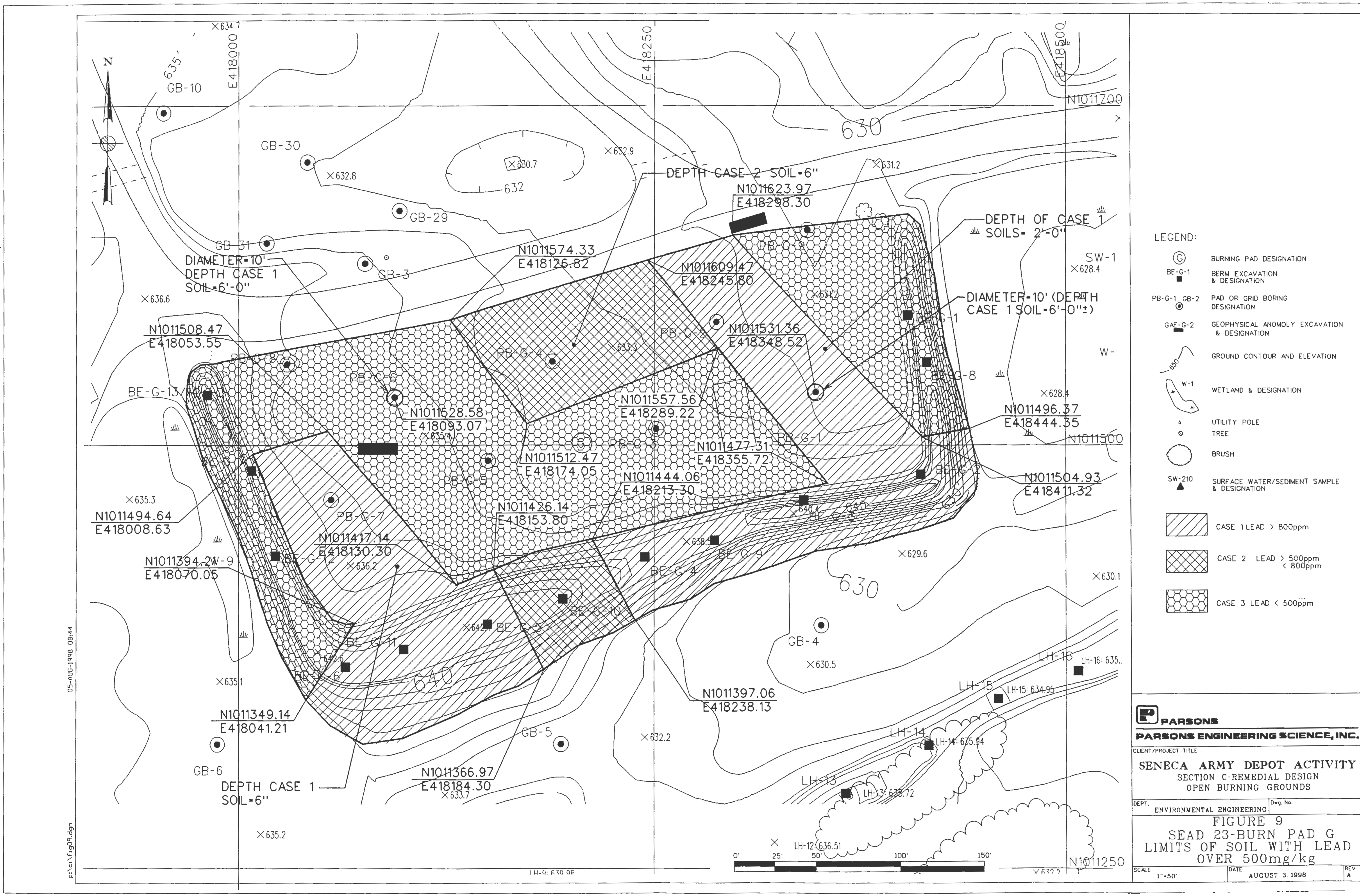


PARSONS

PARSONS ENGINEERING SCIENCE, INC.

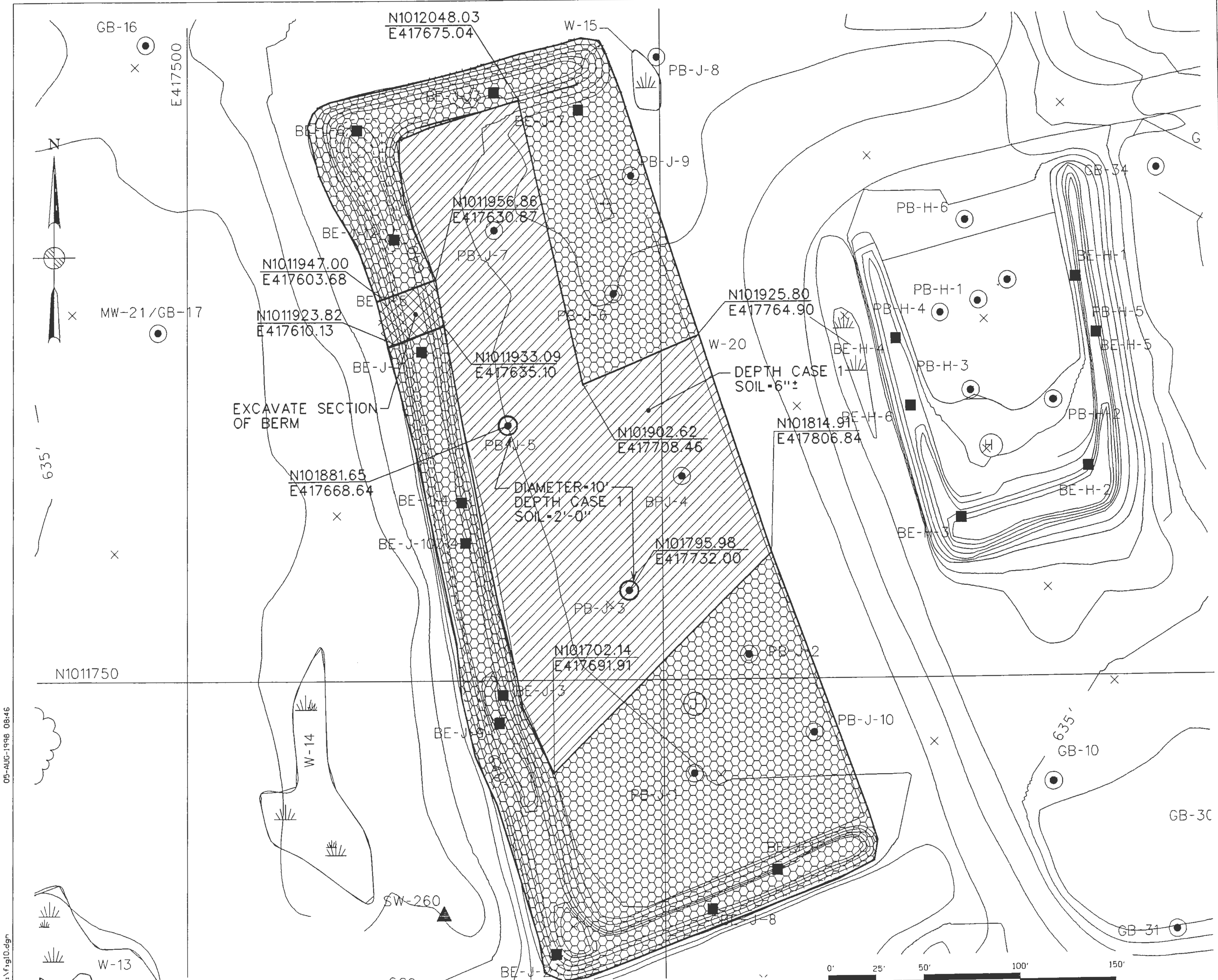
CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 9
SEAD 23-BURN PAD G
LIMITS OF SOIL WITH LEAD
OVER 500mg/kg

SCALE 1"=50' | DATE AUGUST 3, 1998 | REV A



LEGEND:

- (G) BURNING PAD DESIGNATION
- BE-G-1 BERM EXCAVATION & DESIGNATION
- PB-G-1 GB-2 PAD OR GRID BORING DESIGNATION
- GAE-G-2 GEOPHYSICAL ANOMOLY EXCAVATION & DESIGNATION
- 650 GROUND CONTOUR AND ELEVATION
- W-1 WETLAND & DESIGNATION
- UTILITY POLE
- TREE
- BRUSH
- SW-210 SURFACE WATER/SEDIMENT SAMPLE & DESIGNATION
- CASE 1 LEAD > 800ppm
- CASE 2 LEAD > 500ppm < 800ppm
- CASE 3 LEAD < 500ppm

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CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

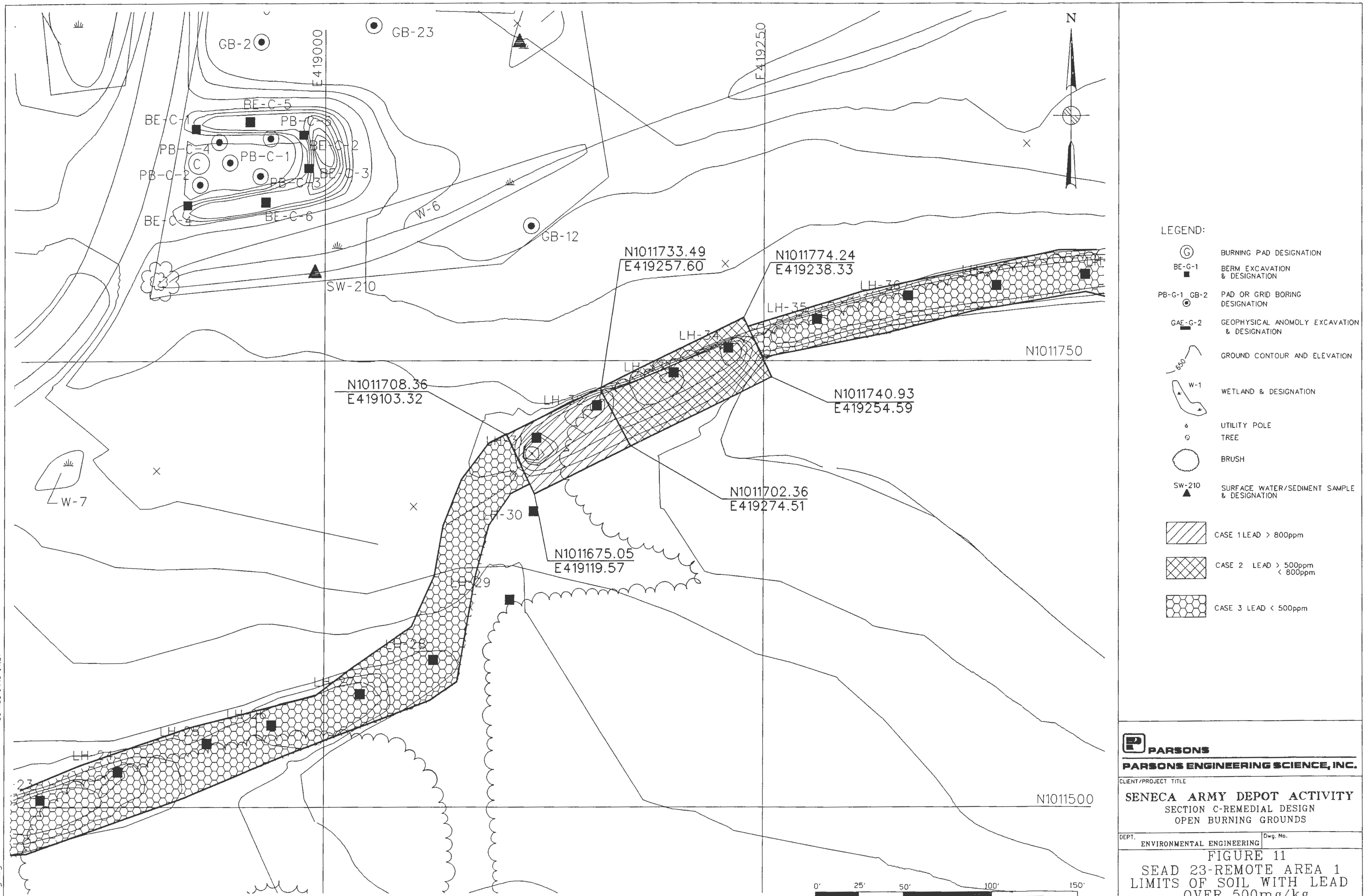
DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 10
SEAD 23-BURN PAD J
LIMITS OF SOIL WITH LEAD
OVER 500mg/kg

SCALE 1"=50' | DATE AUGUST 3, 1998 | REV A

05-AUG-1998 08:46

p:\c:\fig10.dgn



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SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

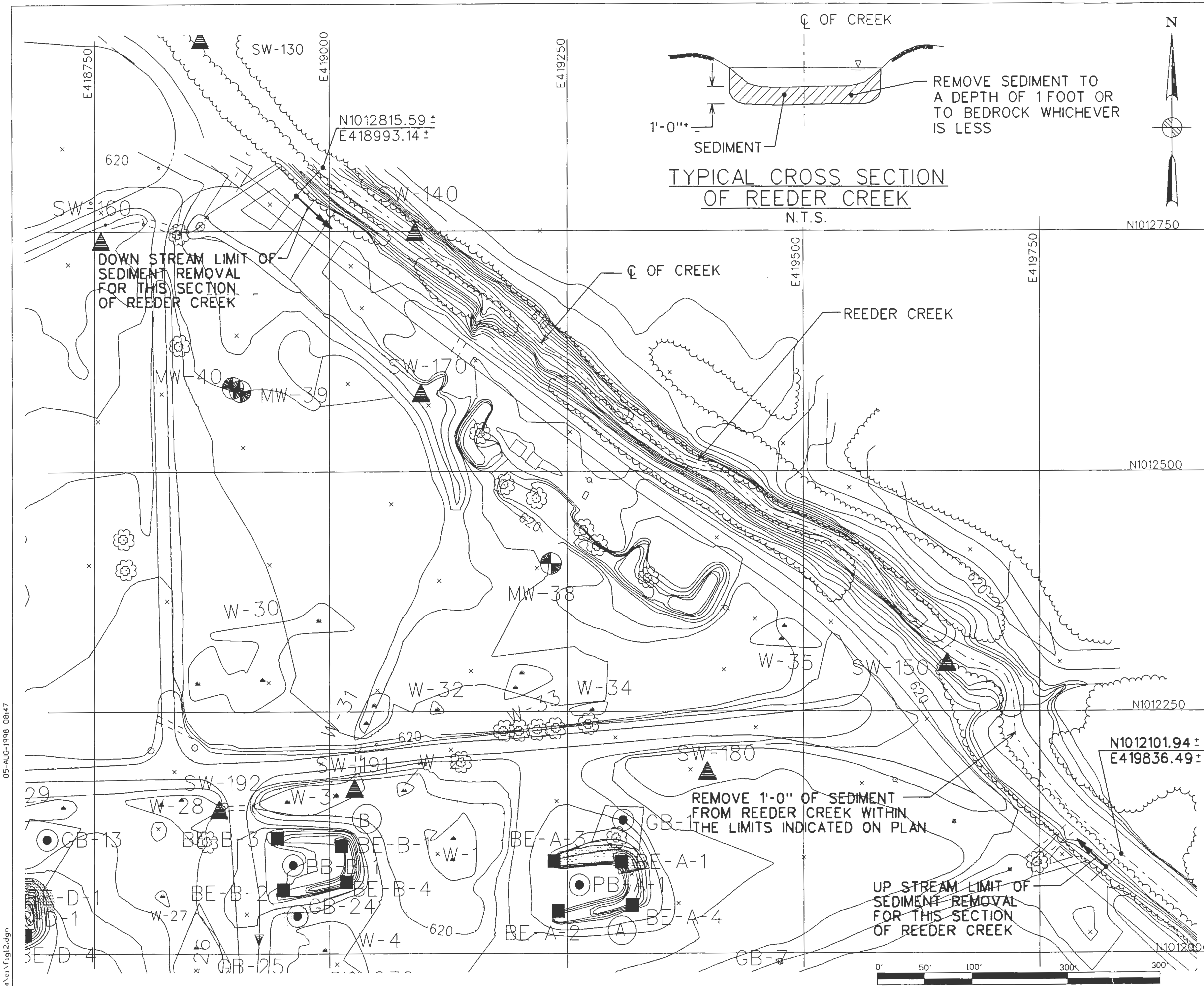
DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 11
SEAD 23-REMOTE AREA 1
LIMITS OF SOIL WITH LEAD
OVER 500mg/kg

SCALE 1"=50' | DATE AUGUST 3, 1998 | REV

03-AUG-1998 14:57

p:\c:\fig11.dgn



LEGEND:

- BURNING PAD DESIGNATION
- BE-G-1 BERM EXCAVATION & DESIGNATION
- PB-G-1 GB-2 PAD OR GRID BORING DESIGNATION
- GAE-G-2 GEOPHYSICAL ANOMOLY EXCAVATION & DESIGNATION
- 650 GROUND CONTOUR AND ELEVATION
- W-1 WETLAND & DESIGNATION
- UTILITY POLE
- TREE
- BRUSH
- SW-210 SURFACE WATER/SEDIMENT SAMPLE & DESIGNATION
- CASE 1 LEAD > 800ppm
- CASE 2 LEAD > 500ppm < 800ppm
- CASE 3 LEAD < 500ppm

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SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

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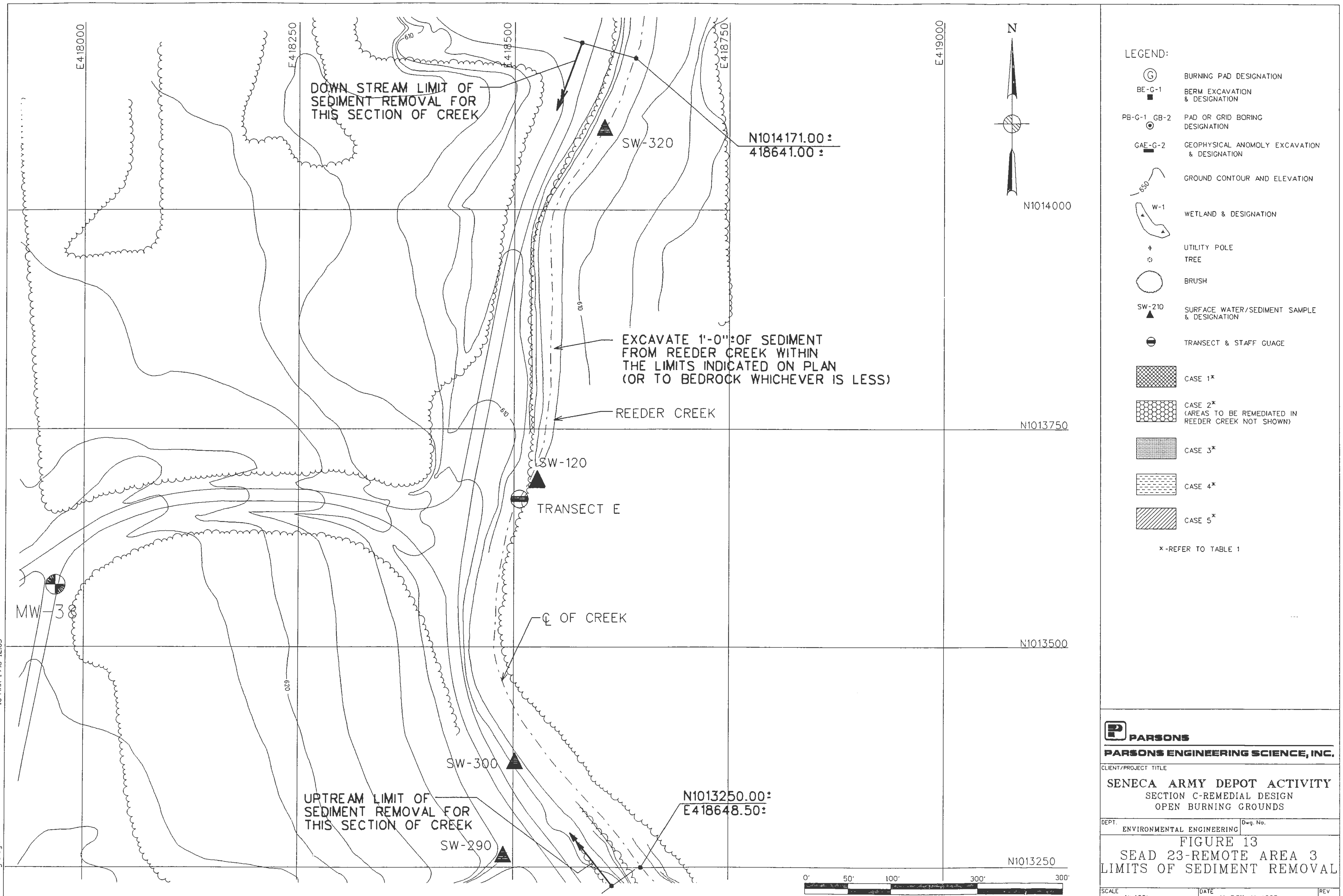
FIGURE 12
SEAD 23-REMOTE AREA 2
LIMITS OF SEDIMENT REMOVAL

SCALE 1"=100' | DATE AUGUST 3, 1998 | REV A

05-AUG-1998 08:47
p:\c:\fig12.dgn



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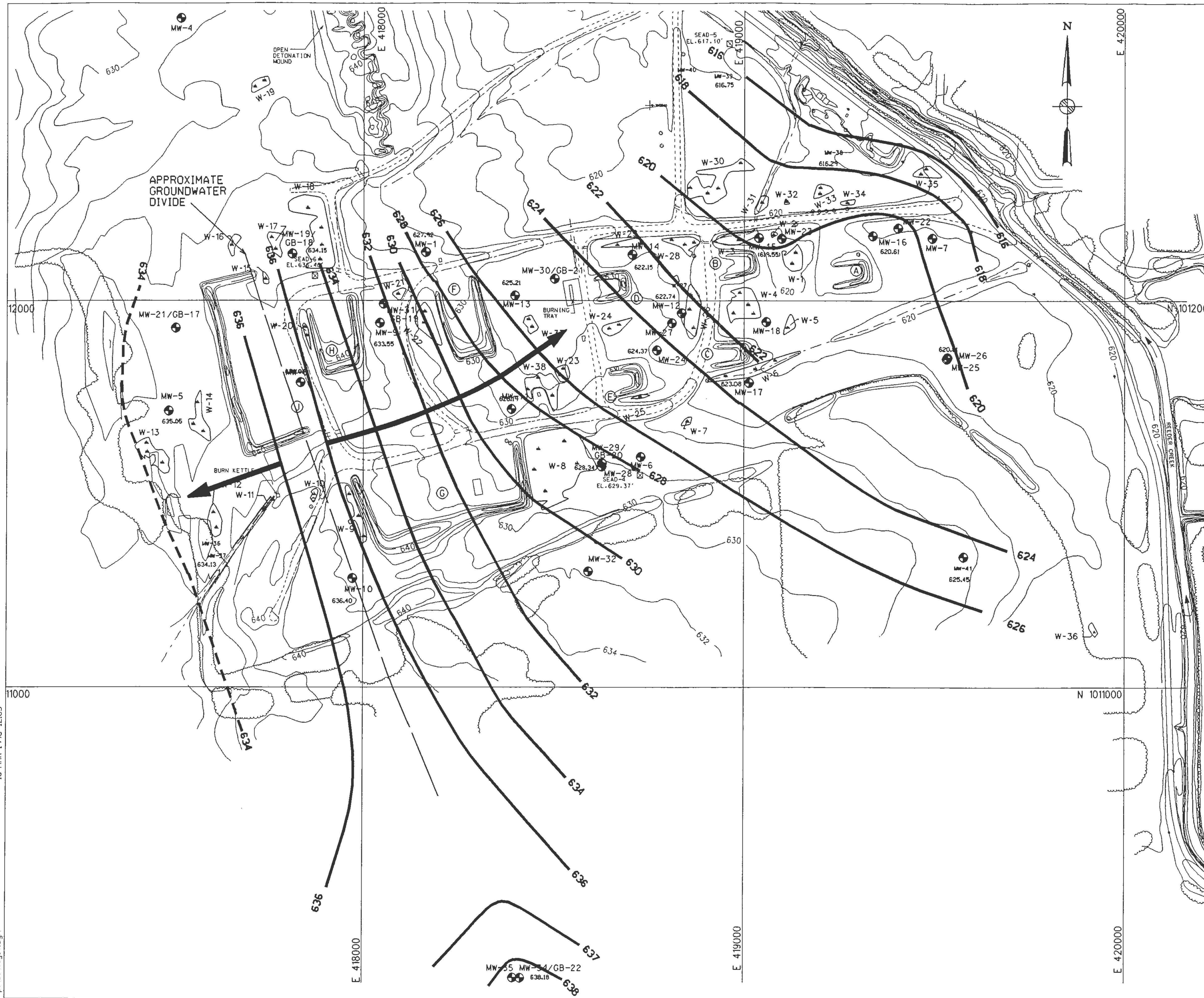
SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 13
SEAD 23-REMOTE AREA 3
LIMITS OF SEDIMENT REMOVAL

SCALE 1"=100' | DATE MARCH 11, 1998 | REV

p:\c:\fig13.dgn



LEGEND:

MW-27 617.71	MONITORING WELL & DESIGNATION & GROUNDWATER ELEVATION
	PAVED ROAD
	DIRT ROAD
650	GROUND CONTOUR AND ELEVATION
	UTILITY POLE
	TREE
	BRUSH
W-1	WETLAND & DESIGNATION
	RUNOFF SWALE
D	BURNING PAD DESIGNATION
	CULVERT
SEAD-4 EL.629.37'	MONUMENT AND DESIGNATION
632	GROUNDWATER ELEVATION CONTOURS (DASHED WHERE INFERRED)
	GROUND WATER FLOW DIRECTION

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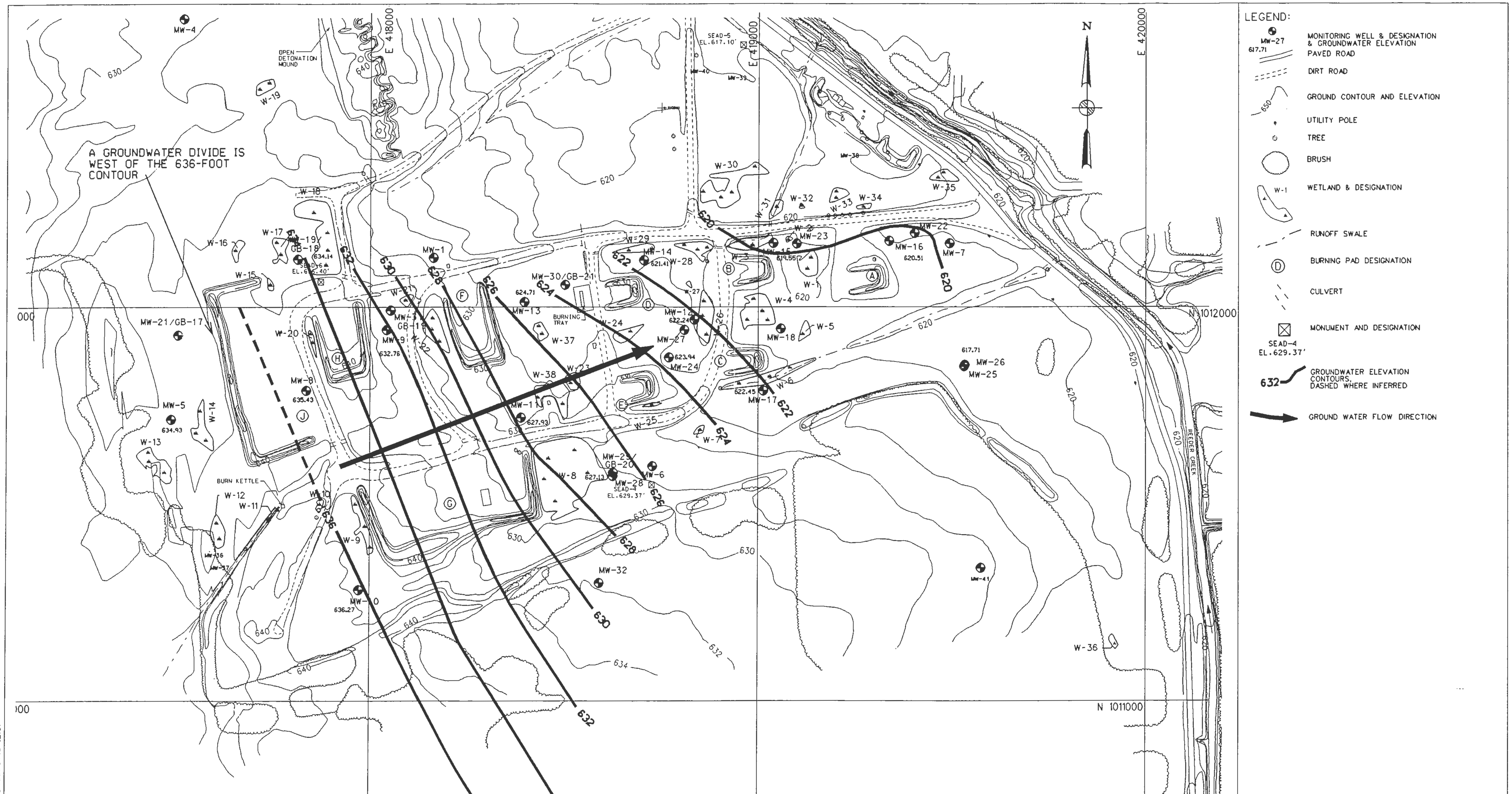
SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 14
GROUNDWATER ELEVATIONS,
TILL MOITORING WELLS
APRIL 1993

SCALE 1"=250 | DATE MARCH 11, 1998 | REV



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CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

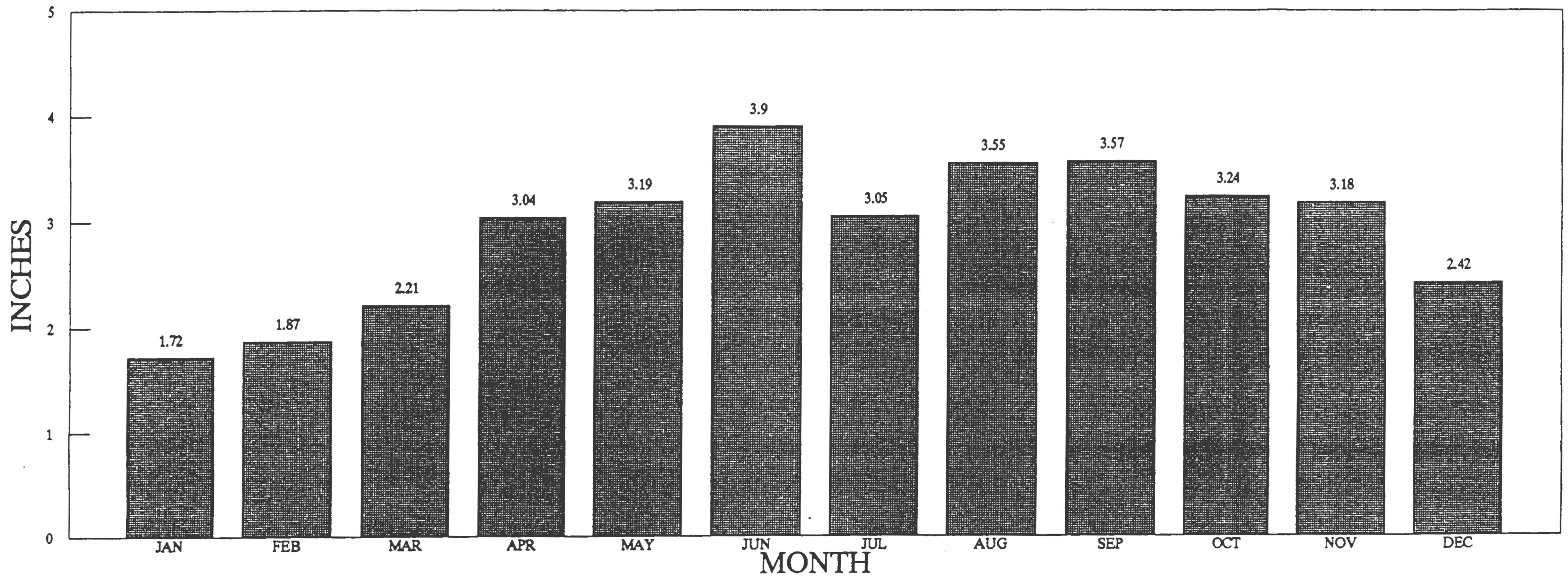
DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	

FIGURE 15
GOUNDWATER ELEVATIONS,
TILL MONITORING WELLS
JANUARY 1992

SCALE	DATE	REV
1"=250'	MARCH 11, 1998	

16-MAR-1998 12:07

p:\c\fig15.dgn



ES
ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

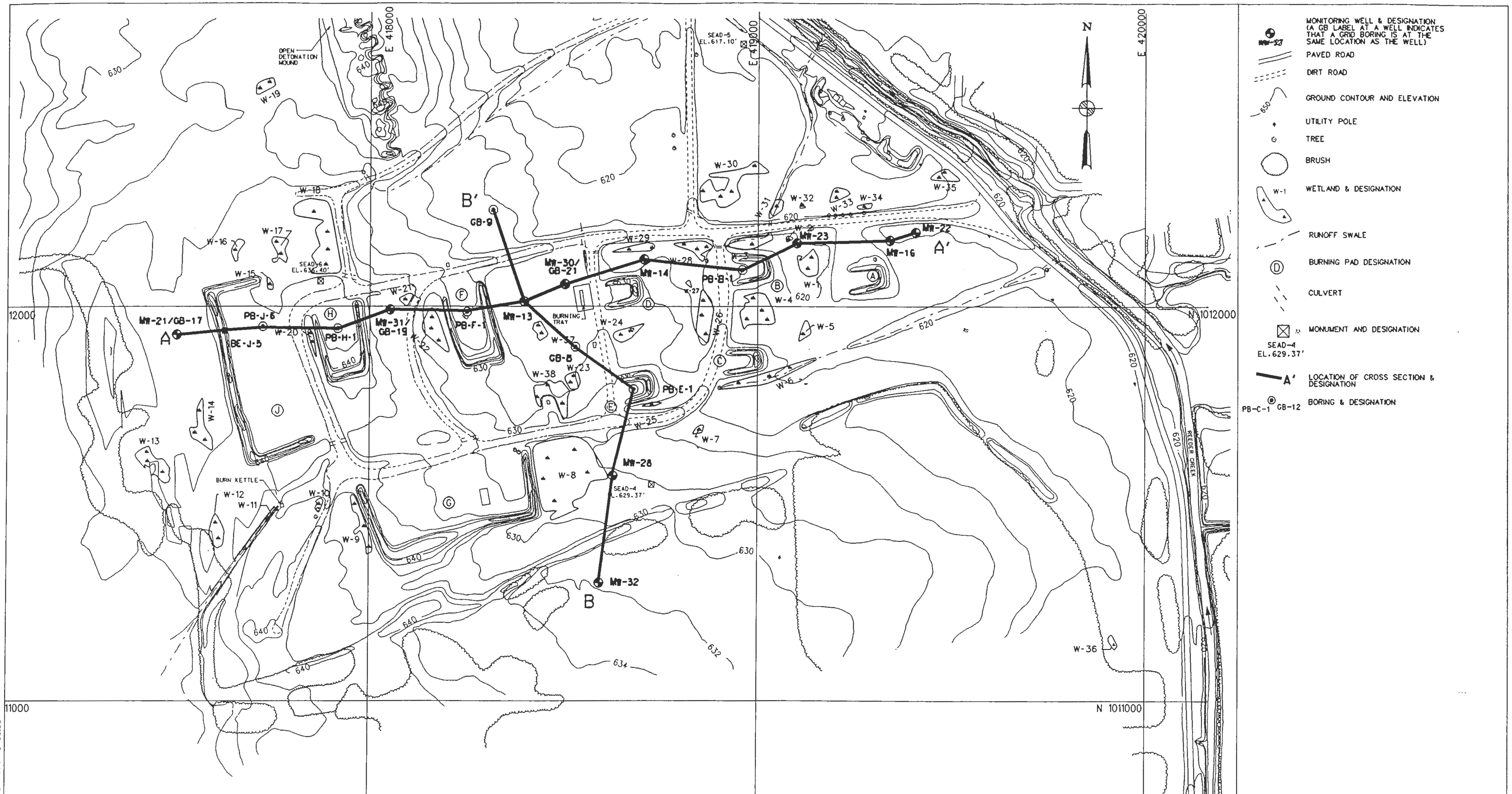
SENECA ARMY DEPOT
REMEDIAL INVESTIGATION / FEASIBILITY STUDY
OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING	NO. 720446-01000

FIGURE 16

AVERAGE MONTHLY PRECIPITATION
1958-1991

SCALE



PARSONS

PARSONS ENGINEERING SCIENCE, INC.

CLIENT/PROJECT TITLE

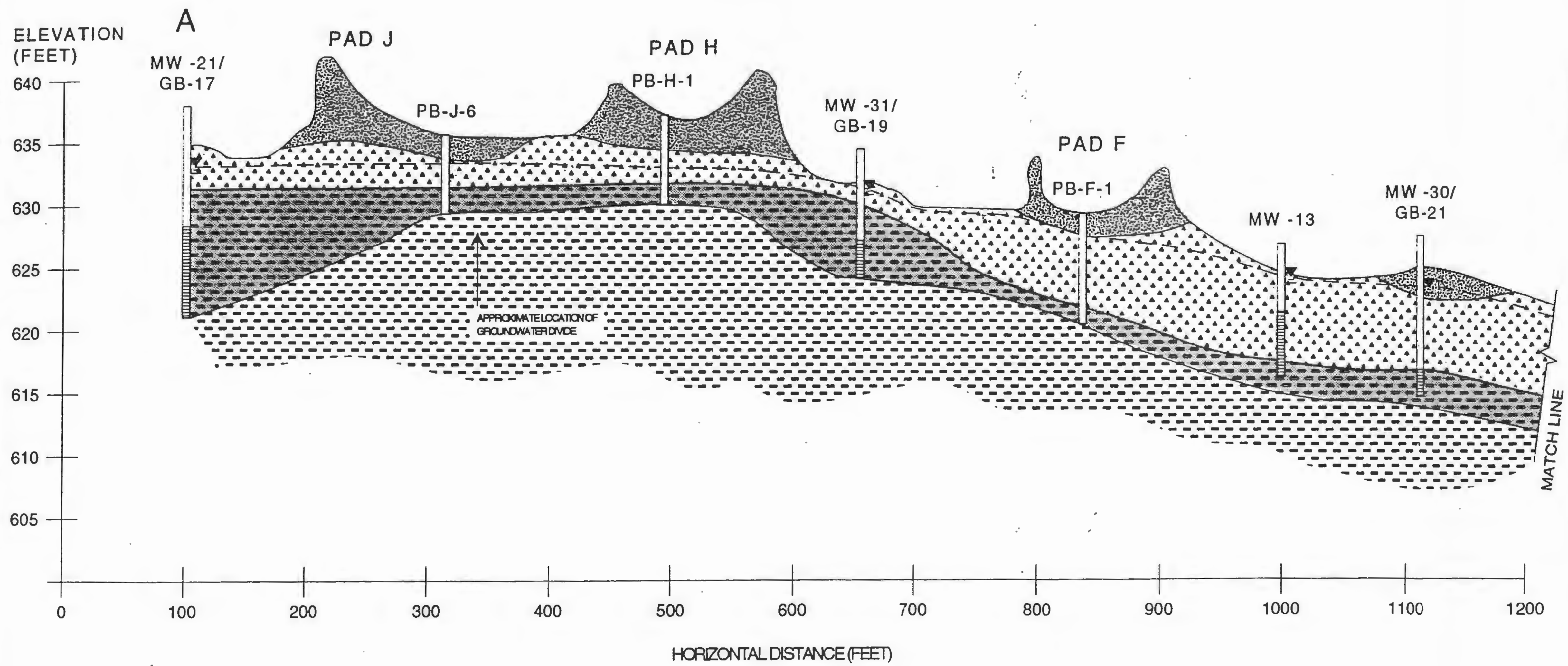
SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 17
LOCATION OF
GEOLOGIC CROSS SECTIONS

SCALE 1"=250' | DATE | REV

CROSS SECTION A - A'



LEGEND:

- FILL
- TILL
- WEATHERED SHALE
- COMPETENT SHALE
- GROUNDWATER TABLE

NOTES:

1. Lithologic units are based on descriptions supplied by Engineering-Science, Inc. Interpretations are based on extrapolations between widely spaced boreholes, actual conditions may vary.

2. Groundwater table based on depth to water measurements made in January 1992.

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ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT
REMEDIAL INVESTIGATION / FEASIBILITY STUDY
OPEN BURNING GROUNDS

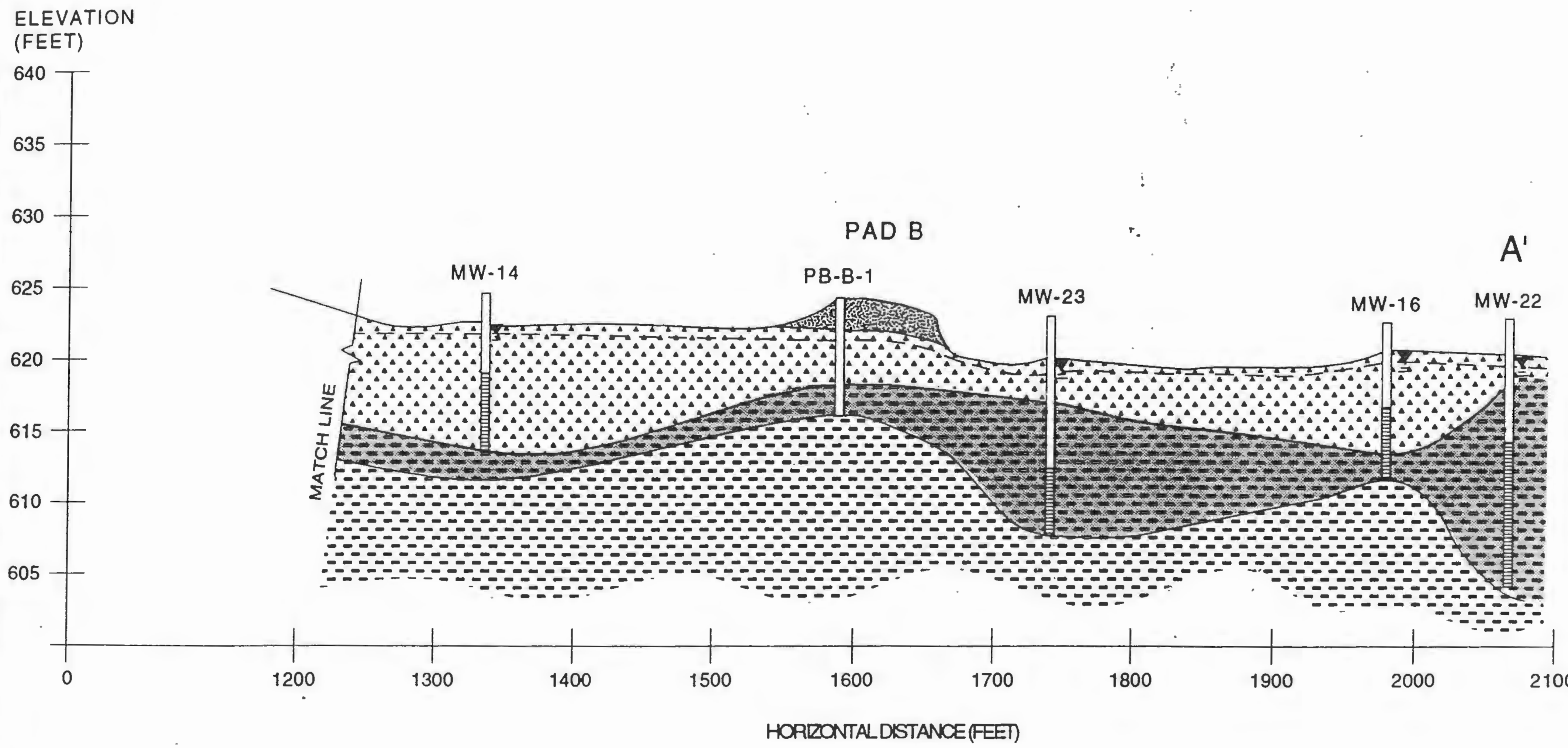
DEPT ENVIRONMENTAL ENGINEERING	NO. 720446-01000

FIGURE 18
CROSS-SECTION A - A'

SCALE HORIZONTAL: 1" = 100' VERTICAL: 1" = 10'

ES'S DWG NO 720446-01000-C6	REV. A

CROSS SECTION A - A' (continued)



LEGEND:

- FILL
- TILL
- WEATHERED SHALE
- COMPETENT SHALE
- GROUNDWATER TABLE

NOTES:

1. Lithologic units are based on descriptions supplied by Engineering-Science, Inc. Interpretations are based on extrapolations between widely spaced boreholes, actual conditions may vary.
2. Groundwater table based on depth to water measurements made in January 1992.

ES
ENGINEERING-SCIENCE, INC.

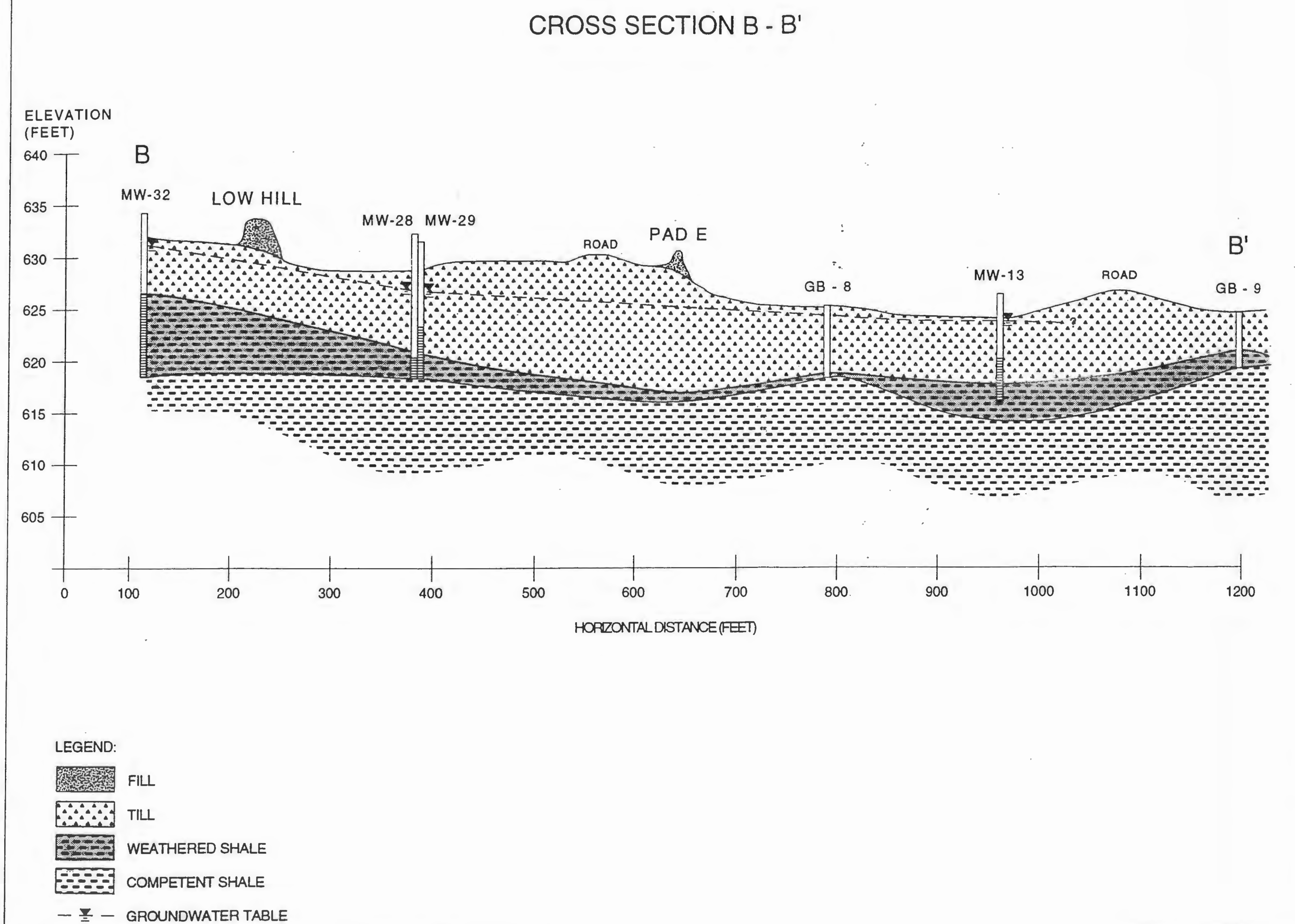
CLIENT/PROJECT TITLE
SENECA ARMY DEPOT
REMEDIAL INVESTIGATION / FEASIBILITY STUDY
OPEN BURNING GROUNDS

DEPT ENVIRONMENTAL ENGINEERING | NO 720446-01000

FIGURE 19
CROSS-SECTION A - A' (continued)

SCALE HORIZONTAL: 1" = 100' VERTICAL: 1" = 10'

ES'S DWG NO 720446-01000-C6 | REV A



NOTES:

1. Lithologic units are based on descriptions supplied by Engineering-Science, Inc. Interpretations are based on extrapolations between widely spaced boreholes, actual conditions may vary.

2. Groundwater table based on depth to water measurements made in January 1992.

ES
ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

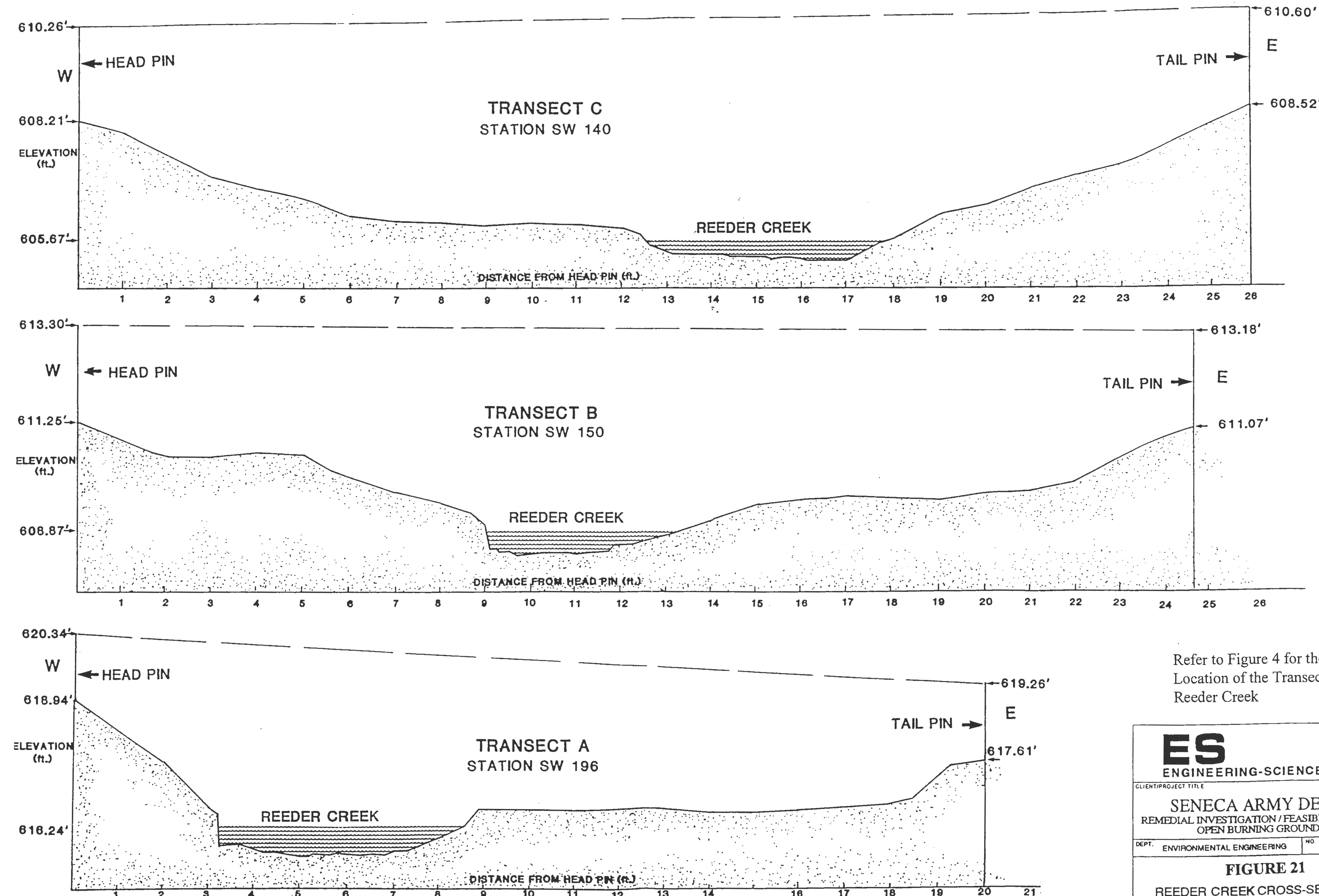
SENECA ARMY DEPOT
REMEDIAL INVESTIGATION / FEASIBILITY STUDY
OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING | NO. 720446-01000

FIGURE 20
CROSS-SECTION B - B'

SCALE HORIZONTAL: 1" = 100' VERTICAL: 1" = 10'

ES'S DWG. NO 720446-01000-C6 | REV A



Refer to Figure 4 for the Location of the Transects in Reeder Creek

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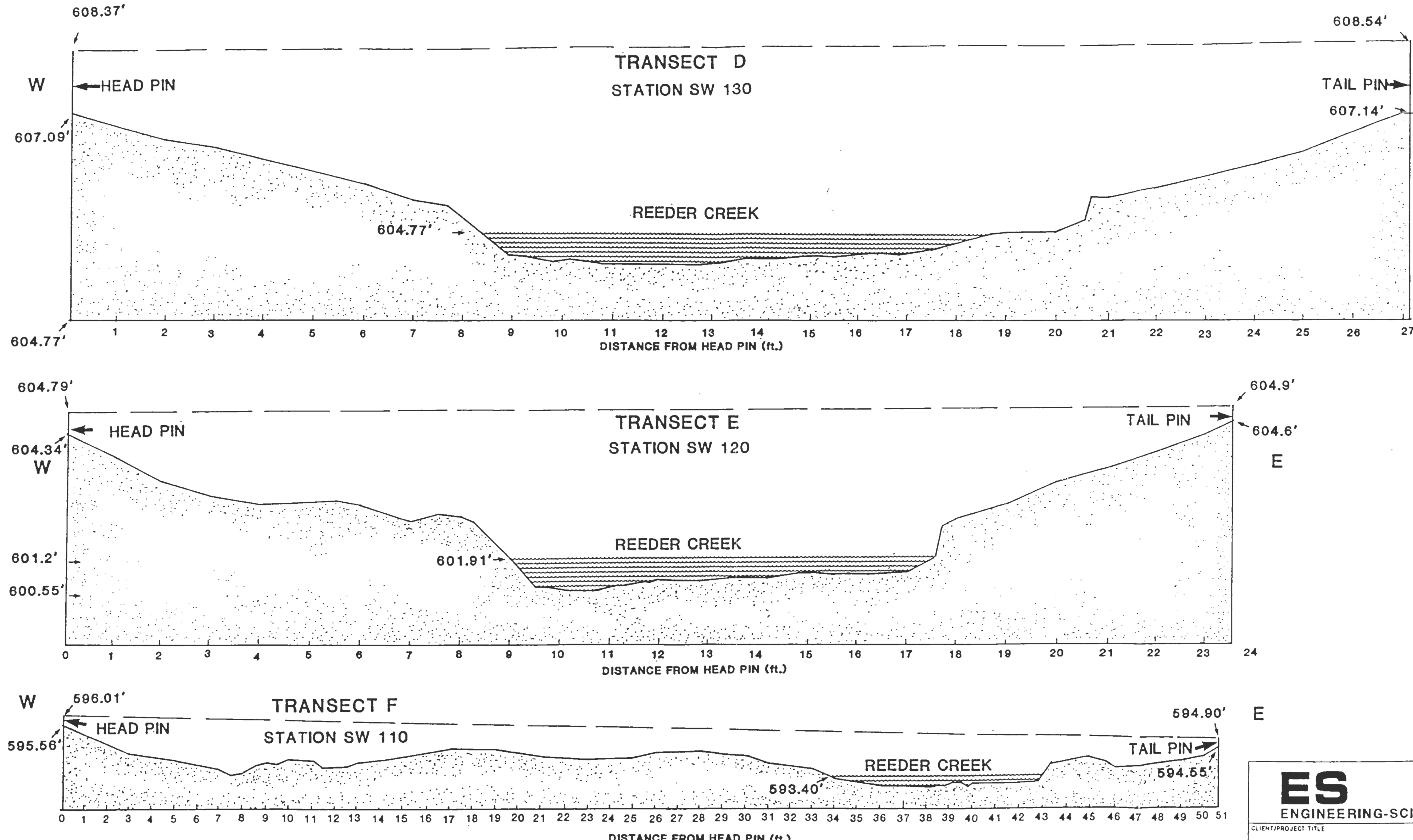
REMEDIAL INVESTIGATION / FEASIBILITY STUDY
OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING | NO. 720446-01000

FIGURE 21

REEDER CREEK CROSS-SECTIONS A, B, AND C

SCALE



ES
ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

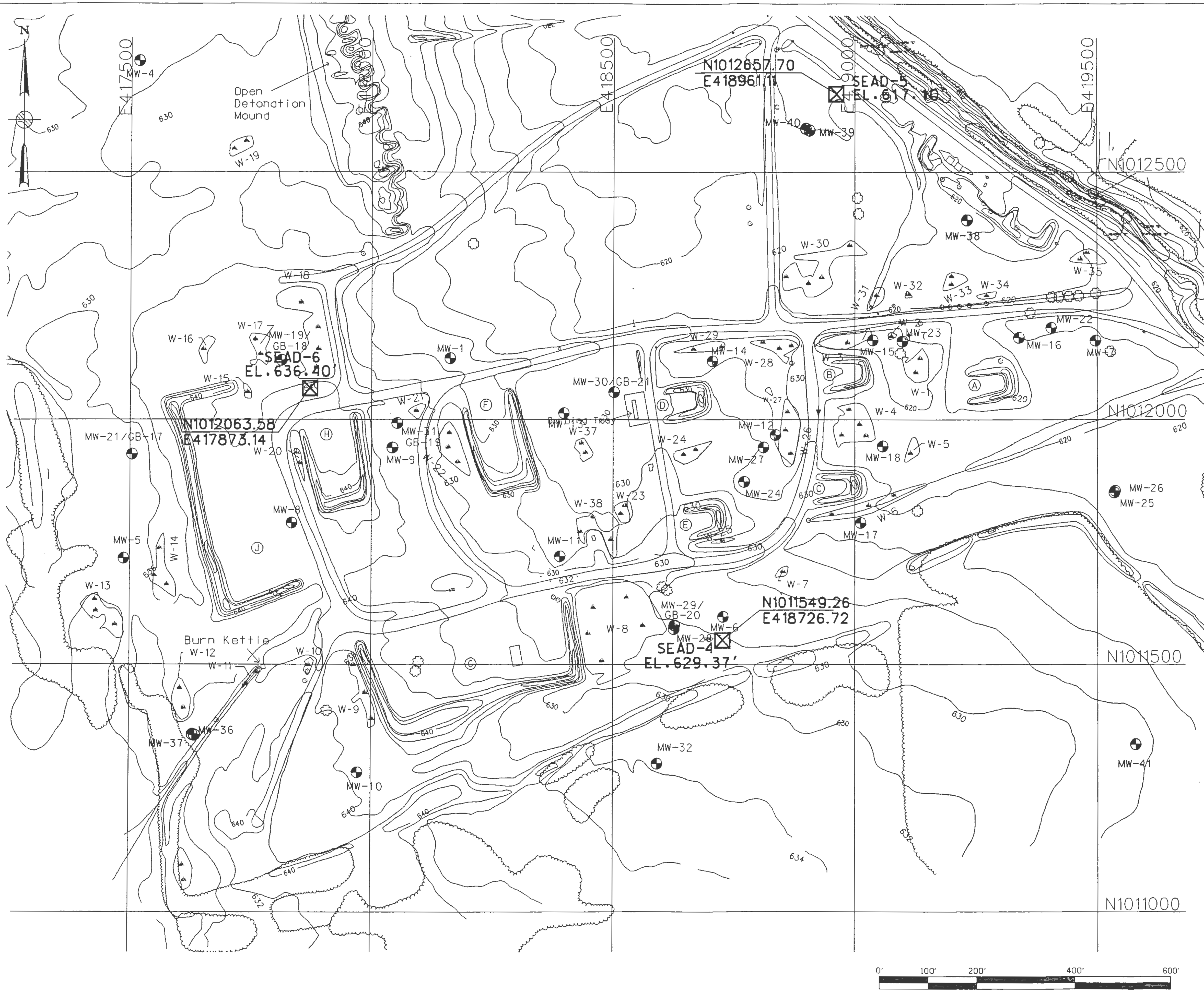
SENECA ARMY DEPOT
REMEDIAL INVESTIGATION / FEASIBILITY STUDY
OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING	NO 720446-01000

FIGURE 22

REEDER CREEK CROSS-SECTIONS
D, E, AND F

SCALE



SUMMARY OF WETLAND AREA LOCATED ON PROPOSED SOIL CAP

WETLAND ID •	AREA (S.F.)
W-1	2565
W-2	177
W-3	2510
W-4	5538
W-5	925
W-6	4663
W-7	390
W-8	26002
W-9	2637
W-10	2285
W-11	196
W-12	2285
W-13	3695
W-14	3131
W-15	370
W-16	975
W-17	1790
W-18	11374
W-19	1280
W-20	575
W-21	654
W-22	3771
W-23	1292
W-24	1746
W-25	300
W-26	5686
W-27	148
W-28	2221
W-29	1471
W-30	7495
W-31	1043
W-32	135
W-33	1189
W-34	423
W-35	1524
W-37	1108
W-38	4290
	TOTAL= 107859 S.F. (2.50 ACRES)

LEGEND:

MW-38 MONITORING WELL

G BURNING PAD DESIGNATION

650 GROUND CONTOUR AND ELEVATION

W-1 WETLAND & DESIGNATION

UTILITY POLE

TREE

BRUSH

SURVEY MONUMENT

SEAD-4
EL.629.37'

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CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

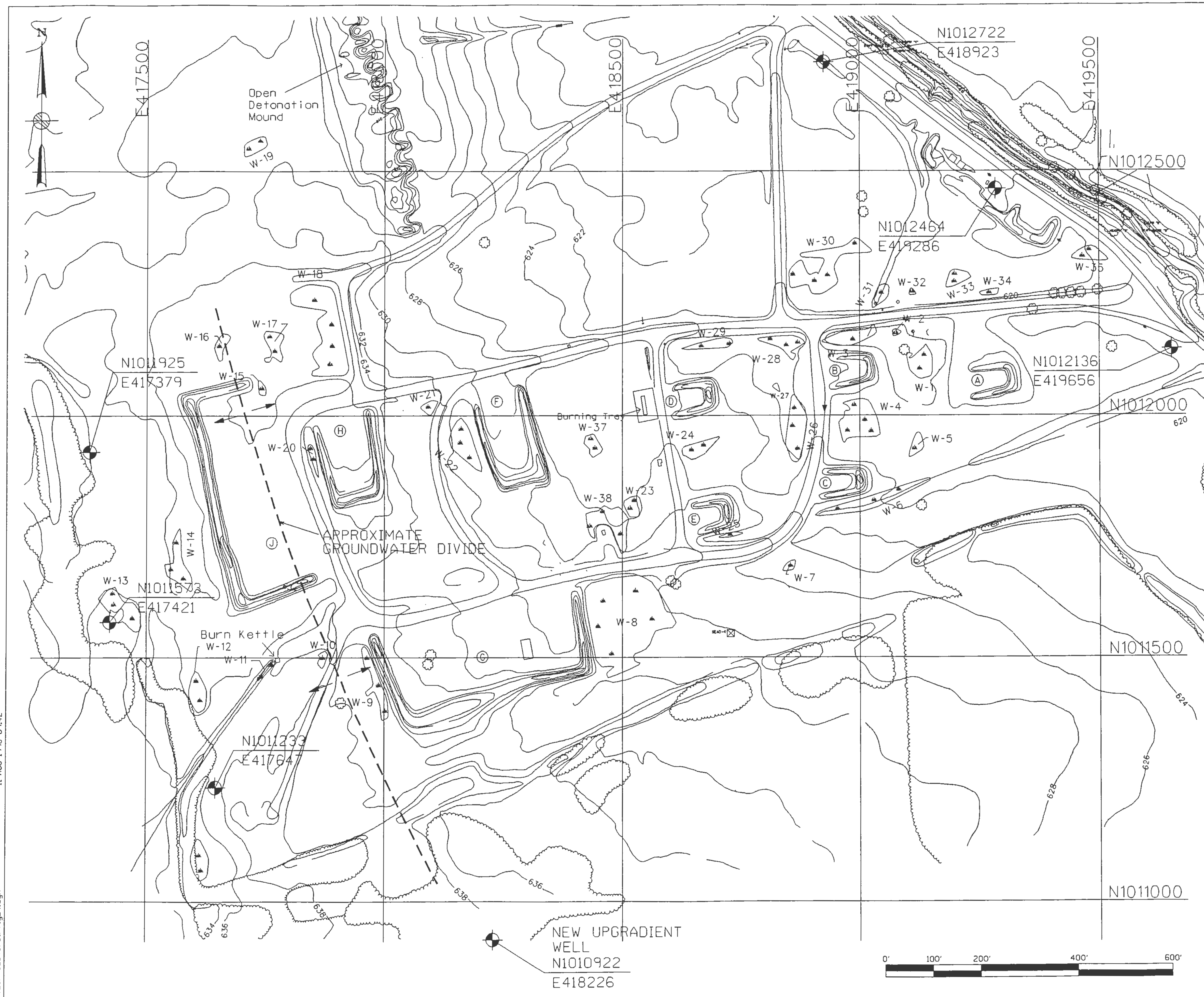
DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 23
SEAD 23 EXISTING WETLANDS AREAS, SURVEY MONUMENTS AND MONITORING WELLS

SCALE 1"=200' | DATE MARCH 11, 1998 | REV

16-MAR-1998 12:18

pt\c\fig23.dgn



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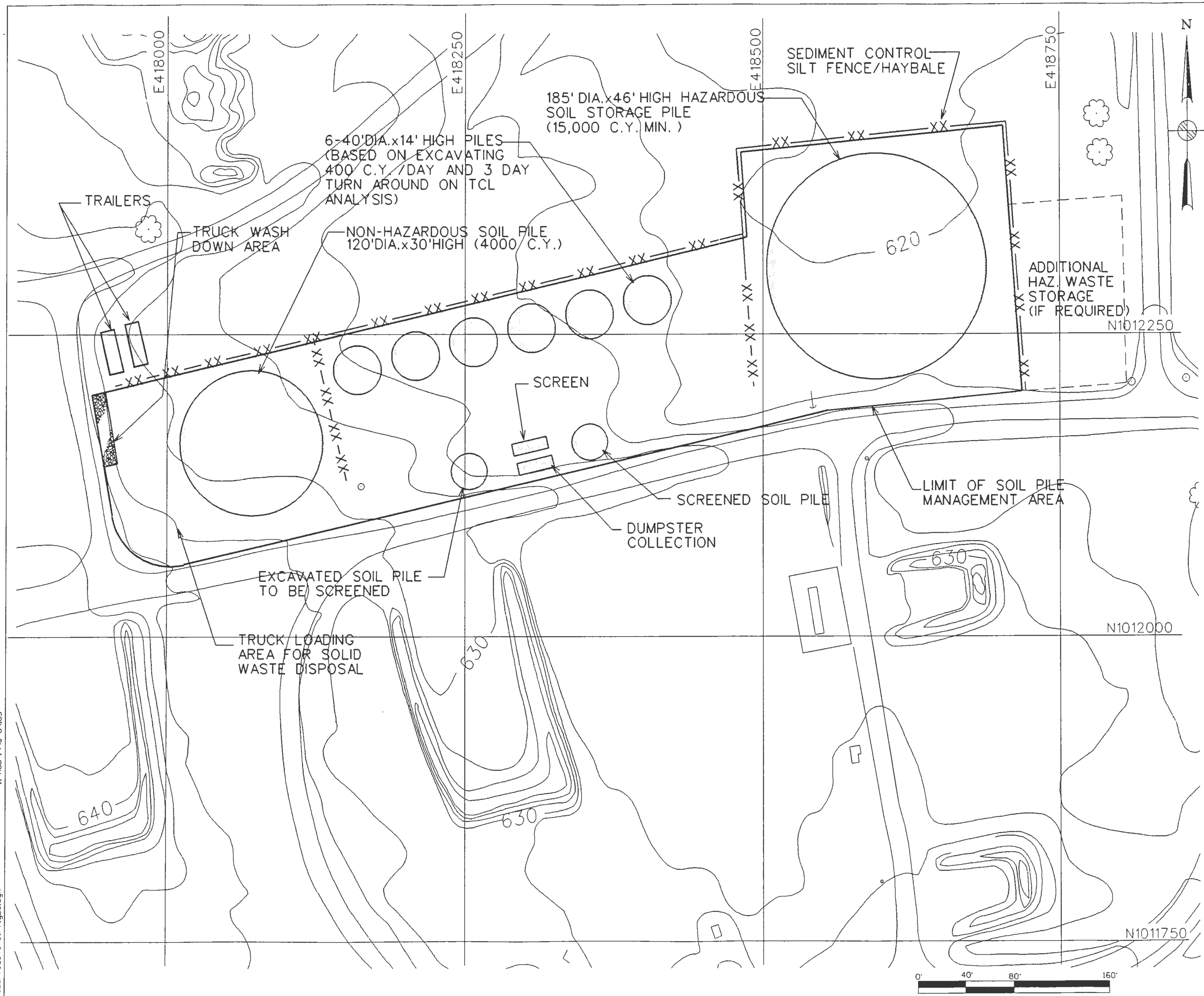
SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	

FIGURE 24
SITE PLAN
NEW MONITORING WELL LOCATIONS

SCALE	DATE	REV
1"=200'	AUGUST 11, 1998	A



1. EODT'S SOIL PILE MANAGEMENT AREA COULD BE USED FOR THE SOIL SOLIDIFICATION PROCESS AFTER ALL THE EXCAVATED SOIL HAS BEEN SCREENED AND TESTED.
2. THIS IS A TYPICAL ARRANGEMENT THAT COULD BE USED IF THE STABILIZATION IS DONE AFTER EODT IS FINISHED. IF SOIL SOLIDIFICATION IS DONE WHILE EODT IS CLEARING THE SITE THAN THE SOIL SOLIDIFICATION PROCESSING AREA WOULD HAVE TO BE OUTSIDE OF THE EDOT EXCLUSION AREA.
3. SOIL PILES FOR SOIL WITH LEAD <500 PPM LEAD WILL ALSO BE REQUIRED IF IT IS NOT USED FOR BACKFILL RIGHT AWAY.

LEGEND:

- G — BURNING PAD DESIGNATION
- BE-G-1 — BERM EXCAVATION & DESIGNATION
- PB-G-1 GB-2 — PAD OR GRID BORING DESIGNATION
- GAE-G-2 — GEOPHYSICAL ANOMOLY EXCAVATION & DESIGNATION
- 650 — GROUND CONTOUR AND ELEVATION
- W-1 — WETLAND & DESIGNATION
- UTILITY POLE
- TREE
- BRUSH

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SENECA ARMY DEPOT ACTIVITY
SECTION C-REMEDIAL DESIGN
OPEN BURNING GROUNDS

DEPT. ENVIRONMENTAL ENGINEERING	Dwg. No.

FIGURE 25
GENERAL ARRANGEMENT
SOIL PILE MANAGEMENT AREA

SCALE	DATE	REV
1"=80'	MARCH 11, 1998	

11-AUG-1998 09:05
/a23/732548/c1/fig25.dgn

APPENDIX A

NEW YORK STATE DEPARTMENT OF HEALTH COMMUNITY AIR MONITORING PLAN AND NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DIVISION TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM FUGITIVE DUST SUPPRESSION AND PARTICULATE MONITORING AT INACTIVE HAZARDOUS WASTE SITES

New York State Department of Environmental Conservation

MEMORANDUM

TO: Regional Hazardous Waste Remediation Engrs., Bur. Directors & Section Chiefs
FROM: Michael J. O'Toole, Jr., Director, Division of Hazardous Waste Remediation
SUBJECT: DIVISION TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM--FUGITIVE DUST SUPPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES
DATE: OCT 27 1989

Michael J. O'Toole

1. Introduction

Fugitive dust suppression, particulate monitoring, and subsequent action levels for such must be used and applied consistently during remedial activities at hazardous waste sites. This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2. Background

Fugitive dust is particulate matter--a generic term for a broad class of chemically and physically diverse substances that exist as discrete particles, liquid droplets or solids, over a wide range of sizes--which becomes airborne and contributes to air quality as a nuisance and threat to human health and the environment.

On July 1, 1987, the United States Environmental Protection Agency (USEPA) revised the ambient air quality standard for particulates so as to reflect direct impact on human health by setting the standard for particulate matter less than ten microns in diameter (PM_{10}); this involves fugitive dust whether contaminated or not. Based upon an examination of air quality composition, respiratory tract deposition, and health effects, PM_{10} is considered conservative for the primary standard--that requisite to protect public health with an adequate margin of safety. The primary standards are 150 ug/m^3 over a 24-hour averaging time and 50 ug/m^3 over an annual averaging time. Both of these standards are to be averaged arithmetically.

There exists real-time monitoring equipment available to measure PM_{10} and capable of integrating over a period of six seconds to ten hours. Combined with an adequate fugitive dust suppression program, such equipment will aid in preventing the off-site migration of contaminated soil. It will also protect both on-site personnel from exposure to high levels of dust and the public around the site from any exposure to any dust. While specifically intended for the protection of on-site personnel as well as the public, this program is not meant to replace long-term monitoring which may be required given the contaminants inherent to the site and its air quality.

3. Guidance

A program for suppressing fugitive dust and monitoring particulate matter at hazardous waste sites can be developed without placing an undue burden on remedial activities while still being protective of health and environment. Since the responsibility for implementing this program ultimately will fall on the party performing the work, these procedures must be incorporated into appropriate work plans. The following fugitive dust suppression and particulate monitoring program will be employed at hazardous waste sites during construction and other activities which warrant its use:

(1) Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

(2) Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Such activities shall also include the excavation, grading, or placement of clean fill, and control measures therefore should be considered.

(3) Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM_{10}) with the following minimum performance standards:

Object to be measured: Dusts, Mists, Aerosols
Size range: <0.1 to 10 microns
Sensitivity: 0.001 mg/m^3
Range: 0.001 to 10 mg/m^3
Overall Accuracy: $\pm$10% as compared to gravimetric analysis of stearic acid or reference dust

Operating Conditions:
Temperature: 0 to 40^oC
Humidity: 10 to 99% Relative Humidity

Power: Battery operated with a minimum capacity of eight hours continuous operation

Automatic alarms are suggested.

Particulate levels will be monitored immediately downwind <u>at</u> the working site and integrated over a period not to exceed 15 minutes. Consequently, instrumentation shall require necessary averaging hardware to accomplish this task; the P-5 Digital Dust Indicator as manufactured by MDA Scientific, Inc. or similar is appropriate.

(4) In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the entity operating the equipment to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

(5) The action level will be established at 150 ug/m^3 over the integrated period not to exceed 15 minutes. While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m^3, the upwind background level must be measured immediately using the same portable monitor. If the working site particulate measurement is greater than 100 ug/m^3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see Paragraph 7). Should the action level of 150 ug/m^3 be exceeded, the Division of Air Resources must be notified in writing within five working days; the notification shall include a description of the control measures implemented to prevent further exceedences.

(6) It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM_{10} at or above the action level. Since this situation has the potential to migrate contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

(7) The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

1. Applying water on haul roads.
2. Wetting equipment and excavation faces.
3. Spraying water on buckets during excavation and dumping.
4. Hauling materials in properly tarped or watertight containers.
5. Restricting vehicle speeds to 10 mph.
6. Covering excavated areas and material after excavation activity ceases.
7. Reducing the excavation size and/or number of excavations.

Experience has shown that utilizing the above-mentioned dust suppression techniques, within reason as not to create excess water which would result in unacceptable wet conditions, the chance of exceeding the 150 ug/m^3 action level at hazardous waste site remediations is remote. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

(8). If the dust suppression techniques being utilized at the site do not lower particulates to an acceptable level (that is, below 150 ug/m^3 and no visible dust), work must be suspended until appropriate corrective measures are approved to remedy the situation. Also, the evaluation of weather conditions will be necessary for proper fugitive dust control--when extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended.

There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require appropriate toxics monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

cc: E. Sullivan
D. Markell
A. DeBarbieri
C. Goddard
R. Tramontano
E. McCandless
A. Fossa
J. Kelleher
J. Colquhoun
M. Keenan
D. Ritter
Regional Directors
Regional Engineers
RSHWE
Reg. Citizen Participation Specs.

Responsiveness Summary
TAGM: Fugitive Dust Suppression and Particulate Monitoring at Inactive Hazardous Waste Sites

The following comments (1. through 12.) have been incorporated into the TAGM:

1. Comment: TAGM covers only dust from hazardous waste; however, dust from non-hazardous construction activity at a site can cause a very troublesome nuisance dust condition that can lead to a considerable public concern and annoyance.

2. Comment: Since solidification and treatment at sites can involve using materials such as kiln dust, lime, etc. that have a high dusting potential, a statement stating the need for special measures for these materials should be considered.

3. Comment: TAGM does not state that when extreme wind conditions make dust control ineffective, as a last resort remedial actions may have to be suspended. In general, evaluation of weather conditions will be necessary for proper dust control.

4. Comment: Piles of excavated material should be covered as well as excluded areas.

5. Comment: A technique for dust suppression should be added for reducing the excavation size and/or the number of excavations.

6. Comment: To insure the validity of the dust measurements performed in accordance with this TAGM, there must be an appropriate QA/QC program.

7. Comment: The TAGM should provide for notification should the action level be exceeded.

8. Comment: For explanatory purposes, it may be useful to explain the significance of the ten micron standard in relation to health effects.

9. Comment: Since the responsibility for implementing this will ultimately fall to the PRP or contractor, the TAGM should state that these procedures must be incorporated into appropriate work plans.

10. Comment: The phrase "increasing the level of protection" should read "increasing the level of personal protection for on-site personnel" for clarity.

11. Comment: Suppression techniques should include atomizing sprays as an effective fugitive dust control method.

12. Comment: Define "fugitive dust."

The following comments (13. through 24.) as noted have been modified for use in the TAGM or rejected as being inappropriate or beyond the scope of the TAGM:

13. Comment: It would be helpful to add a section labeled "Purpose" to outline the specific reasons for monitoring and dust suppression.

Response: The third paragraph of "Background" has been revised to describe the purpose.

14. Comment: The use of calcium chloride as a dust suppressant has been specifically prohibited for this use in the Construction Grants program due to possible adverse environmental effects, and recommendation for its use should be evaluated further.

Response: Calcium chloride has been replaced with water.

15. Comment: The reference to a specific monitoring instrument should be deleted and minimum performance standards be substituted.

16. Comment: The real-time monitors used for monitoring particulates should be equipped with automatic alarms and the necessary averaging hardware.

Response (to 15. and 16.): Minimum performance standards have been adopted. A specific instrument has been kept since it is used by the Division of Air Resources, not as an endorsement but as an example and qualified as such by including "or similar." Automatic alarms are suggested, but not required since they are not minimum standards for performance.

17. Comment: The need for the use of watertight containers is unclear. Although watertight roll-offs may prohibit fine particles from passing through the seals, properly tarped standard dump trucks and roll-offs should provide adequate dust control.

Response: Properly tarping has been added.

18. Comment: In the final paragraph it is suggested that it may be appropriate to modify the particulate standard in consideration of the toxicity of the dust generating material. The PM_{10} standard was developed without regard to the chemical characteristics of the particulate material and it should be used accordingly by the Division.

Response: While particulate monitoring and standards should be virtually independent of the toxicity levels, there may be situations involving toxic dusts that warrant more stringent monitoring and action levels than those conservative levels provided for in this TAGM. If toxic air emissions are a concern, appropriate toxics monitoring and action levels should be in place and this suggestion in the TAGM should remain. However, the details of such are beyond the scope of this TAGM.

19. Comment: TAGM does not address what level of protection should be used for varying concentrations or toxicity of fugitive dust in the work zone.

Response: While increasing the level of personnel protection is addressed as a corrective action to be taken if action level are exceeded, the issue of specific levels of personnel protection is not appropriate for this TAGM.

20. Comment: Since semi-volatiles in vapor phase may not register during the dust or volatile organics monitoring, it is essential that these monitorings by themselves are not construed as providing complete safeguards.

Response: The issue addressed by the TAGM is the possible need for more stringent action levels for dust and particulates--vapors are a whole different issue beyond the scope of the TAGM.

21. Comment: It is not clear if TAGM specifies the long-term collection and analysis of fugitive dust to ascertain whether toxic chemicals are present in any significant level.

Response: Collection and analysis of fugitive dust are not within the scope of this TAGM.

22. Comment: TAGM does not specify what actions should be taken when the concentration and/or toxicity of fugitive dust may require lower action levels (i.e. health risk assessment).

Response: The intent of the TAGM is to provide a real-time measure of air quality due to fugitive dust during remedial activities at inactive hazardous waste sites, and health risk assessment from the toxicity of the dust is beyond the scope of this TAGM.

23. Comment: The particulate monitoring could also be utilized to evaluate the exposure of the general public to dusts created by the remedial activities. Sampling should be conducted downwind at an off-site receptor such as a residence or school.

Response: By monitoring on-site both down- and upwind with discrete and conservative action levels along with employing a feasible dust suppression program, the public will be protected from any potential impact of the dust.

24. Comment: The TAGM could also address a screening analysis to determine if a particular contaminant is a possible concern in dust fallout.

Response: While there may be instances where screening analysis is necessary, methodologies for such are more appropriately outlined in the Division of Air Resources Air Guide-1, Guidelines for the Control of Hazardous Air Contaminants.

APPENDIX B

ER 385-1-92 SAFETY AND HEALTH ELEMENTS FOR HTRW DOCUMENTS

APPENDIX B

Safety and Health Elements For HTRW Documents

1. Site Description and Contamination Characterization.

a. Describe the site location, topography, approximate size of the site, the onsite jobs/tasks to be performed, and the duration of planned site activities.

b. Compile a complete list of the contaminants found or known to be present in site areas to be impacted by work performed. Compilation of this listing shall be based on results of previous studies; or, if not available, select the likely contaminants based on site history and prior site uses/activities. Include chemical names, concentration ranges, media in which found, locations on-site, and estimated quantities/volumes to be impacted by site work.

2. Hazard/Risk Analysis.

a. Identify the chemical, physical (including radiological), biological, and safety hazards of concern for each site task and/or operation to be performed. Selection of chemicals as indicators of hazards shall be based upon media concentrations (i.e., air, water, soil), toxicity, volatility or risk potential for air entrainment at hazardous levels, and frequency of detection.

b. Describe chemical and physical properties of selected contaminants, sources and pathways of employee exposures, anticipated on- and off-site exposure level potentials, and regulatory (including Federal, State, and Local governments) or recommended protective exposure standards.

c. Specify and justify "action levels" based upon airborne exposure hazards and direct skin contact potentials for upgrades/downgrades in levels of personnel protection; for implementation of engineering and/or work practice controls; for emergency evacuation of on-site personnel; and for the prevention and/or minimization of public exposures to hazards created by site activities. Exposure monitoring/air sampling shall be performed in accordance with paragraph 8 below, resulting data compared with established "action levels," and appropriate corrective actions initiated as necessary.

3. Accident Prevention.

a. Any additional Accident Prevention Plan topics required by EM 385-1-1, but not specifically covered elsewhere in these elements, shall be addressed.

b. Daily safety and health inspections shall be conducted to determine if operations are being performed in accordance with the SSHP, USACE and OSHA regulations, and contract requirements.

c. In the event of an accident/incident, the CO (or approving authority for in-house USACE activities) shall be notified according to EM 385-1-1, Section 2. Within two (2) working days of any reportable accident, the contractor (or responsible USACE supervisor for in-house USACE activities) shall complete and submit an Accident Report on ENG Form 3394 in accordance with AR 385-40 and USACE Supplements to that regulation.

4. Staff Organization, Qualifications, and Responsibilities.

a. Discuss the organizational structure, including lines of authority (chain of command), and overall responsibilities of the contractor and all subcontractors for site activities, including supervisor/employee relationships.

b. Summarize the operational and health and safety responsibilities, and qualifications of each key person identified.

(1) Specifically, a Certified Industrial Hygienist (CIH) with experience in the hazardous waste site operations shall be responsible for the development, implementation, and oversight of the contractor's Safety and Health Program (SHP) and Site Safety and Health Plan (SSHP). The SSHP shall be signed and dated by the CIH prior to submittal. (For in-house USACE activities, this responsibility shall be undertaken by qualified USACE industrial hygiene personnel at the geographic Major Subordinate Command/ District Command performing the work.)

(2) A fully trained and experienced Site Safety and Health Officer (SSHO), responsible to the contractor and the CIH (or the USACE approving authority), may be delegated to implement and continually enforce the safety and health program and site-specific plan elements on-site.

(3) At least one person currently certified in Standard First Aid/CPR by the American Red Cross or equivalent agency, according to EM 385-1-1, Section 4, shall be present on-site at all times during site operations.

5. Training.

a. All personnel performing on-site work activities wherein they may be exposed to safety or health hazards resulting from hazardous waste operations shall have completed applicable training in compliance with 29 CFR 1910.120(e).

b. Prior to conducting on-site HTRW activities, all USACE and contractor personnel shall successfully complete a 40 hour HTRW health and safety training course to be followed by an 8-hour annual refresher and/or an 8-hour supervisors course as mandated in OSHA (29 CFR 1910.120) and this regulation.

c. In addition, site-specific training covering site hazards, procedures, and all contents of the approved SSHP shall be conducted by the SSHO for on-site employees and visitors prior to commencement of work or entering the site.

d. The type (including initial, supervisory, refresher, and site-specific), duration, and dates of all employee training performed shall be listed by employee name and certified in the SSHP.

6. Personal Protective Equipment (PPE).

a. A written Personal Protective Equipment (PPE) program in accordance with 29 CFR 1910.120(g)(5) and the respiratory protection requirements of 29 CFR 1910.134 is required.

b. Provide a detailed description of the minimum PPE (including respirators) and specific materials from which the PPE components are constructed for each site-specific task/operation to be performed, based upon the hazard/risk analysis performed above. Component levels of protection (A,B,C,D and modifications) must be relevant to site-specific conditions, including potential heat stress and associated PPE safety hazards.

c. Provide site-specific procedures to determine PPE program effectiveness and for on-site fit-testing of respirators, proper cleaning, maintenance, inspection, and storage of all PPE.

7. Medical Surveillance.

a. All personnel performing on-site work activities wherein they may be exposed to safety or health hazards resulting from hazardous waste operations shall be participants in an ongoing medical surveillance program, meeting the requirements of 29 CFR 1910.120(f) and ANSI Z-88.2.

b. All medical surveillance protocols and examination results shall be reviewed by a licensed physician who is certified in Occupational Medicine or who, by necessary training and experience, is considered Board-eligible by the American Board of Preventive Medicine Incorporated.

c. In consultation with such an occupational physician, and based upon probable site conditions, potential occupational exposures and required protective equipment, specify minimum content and frequencies of necessary medical tests/examinations/consultations.

d. Certification of participation in the medical surveillance program, the date of last examination, and name of reviewing occupational physician shall also be included for each affected employee in the SSHP.

e. The written medical opinion from the attending physician required by 29 CFR 1910.120(f)(7) shall be made available upon request to the CO or approving authority for any site employee.

8. <u>Exposure Monitoring/Air Sampling Program</u>.

a. Where it has been determined that there may be potential employee exposures to and/or off-site migration of hazardous concentrations of airborne substances, appropriate direct-reading (real-time) air monitoring and time-integrated (time-weighted average (TWA)) air sampling shall be conducted in accordance with applicable regulations (OSHA, EPA, State). Air monitoring and air sampling must accurately represent concentrations of airborne contaminants encountered on, and leaving, the site.

b. Sampling and analytical methods following NIOSH criteria (for on-site personnel) and EPA criteria (for site perimeter or off-site locations) shall be appropriately utilized.

c. Personnel samples shall be analyzed only by laboratories successfully participating, in and meeting the requirements of the American Industrial Hygiene Association's (AIHA) Proficiency Analytical Testing (PAT) or Laboratory Accreditation programs.

d. Meteorological monitoring shall be performed on-site and used as an adjunct in determining perimeter and any off-site monitoring locations. Where perimeter monitoring/sampling is not deemed necessary, a suitable justification for its exclusion should be provided.

e. Noise monitoring and radiation monitoring (alpha, beta, gamma) shall be conducted as needed, depending on the site hazard assessment.

f. All monitoring/sampling results shall be compared to "action levels" established pursuant to paragraph 2. above to determine acceptability and need for corrective action.

9. Heat/Cold Stress Monitoring.

a. Heat and/or cold stress monitoring protocols shall be specified and implemented, as appropriate.

b. Work/rest schedules shall be developed by measurement of ambient temperature, humidity, wind speed (wind chill), solar radiation intensity, duration and intensity of work, and level of protective equipment.

c. Minimum required physiological monitoring protocols which will affect work schedules shall be developed.

d. In cases where impervious clothing is worn (i.e., full-body protective clothing), the NIOSH/OSHA/USCG/EPA "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" protocol for prevention of heat stress shall be followed, and heat stress monitoring shall commence at temperatures of 70 degrees Fahrenheit and above. Where impervious clothing is not worn, the most current published ACGIH heat stress standard (TLV) shall be used. For cold stress monitoring to help prevent frostbite and hypothermia, the most current published ACGIH cold stress standard shall be referenced and followed, as a minimum.

10. Standard Operating Safety Procedures, Engineering Controls and Work Practices. Address, as appropriate:

a. Site rules/prohibitions (buddy system, eat/drink/ smoking restrictions, etc.).

b. Material handling procedures (soils, liquids, radioactive materials).

c. Drum/container handling procedures and precautions (opening, sampling, overpacking).

d. Confined space entry procedures.

e. Hot-work, sources of ignition, fire protection/prevention, and electrical safety (ground-fault protection, overhead power line avoidance, etc.).

f. Excavation safety.

g. Guarding of machinery and equipment.

h. Fall protection.

i. Hazard Communication.

j. Illumination.

k. Sanitation.

l. Engineering controls.

11. <u>Site Control Measures</u>.

a. Include a site map.

b. Delineate work zones and their access points. Work zone delineation (Exclusion Zone, Contamination Reduction Zone, Support Zone) shall be based upon the contamination characterization data and the hazard/risk analysis to be performed under paragraphs 1 and 2 above.

c. Describe on-site and off-site communications.

d. Describe site security (physical and procedural).

e. Describe general site access.

12. <u>Personal Hygiene and Decontamination</u>.

a. Specify necessary facilities and their locations.

b. Provide detailed standard operating procedures, for frequencies, supplies and materials to accomplish decontamination of site personel.

13. <u>Equipment Decontamination</u>.

a. Specify necessary facilities, equipment, and their locations.

b. Provide detailed procedures, frequencies, supplies and materials, and methods to determine adequacy for the decontamination of equipment used on-site.

14. <u>Emergency Equipment and First Aid Requirements</u>. The following items, as a minimum and as appropriate, shall be immediately available for on-site use:

a. First aid equipment and supplies approved by the consulting physician.

b. Emergency eyewashes/showers (per ANSI Z-358.1).

c. Emergency-use respirators, i.e., escape: 5 - 15 minute emergency escape mask with air bottle; rescue: positive pressure self-contained breathing apparatus (SCBA).

d. Spill control materials and equipment.

e. Fire extinguishers (specify type, size, locations).

15. <u>Emergency Response and Contingency Procedures</u> (On-Site and Off-Site).

a. Local fire/police/rescue authorities having jurisdiction and nearby medical facilities that would be utilized for emergency treatment of injured personnel shall be contacted in order to notify them of upcoming site activities and potential emergency situations, to ascertain their response capabilities, and to obtain a response commitment.

b. An Emergency Response Plan, which complies with 29 CFR 1910.120(l), and which, as a minimum, addresses the following elements, shall be developed and implemented:

(1) Pre-emergency planning and procedures for reporting incidents to appropriate government agencies for potential chemical exposures, personal injuries, fires/explosions, environmental spills and releases, discovery of radioactive materials.

(2) Personnel roles, lines of authority, communications.

(3) Posted instructions and list of emergency contacts: physician/nearby medical facility, fire and police departments, ambulance service, state/local/federal environmental agencies, CIH, Contracting Officer, (approving authority for in-house activities.

(4) Emergency recognition and prevention.

(5) Site topography, layout, and prevailing weather conditions.

(6) Criteria and procedures for site evacuation (emergency alerting procedures/employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control).

(7) Specific procedures for decontamination and medical treatment of injured personnel.

(8) Route maps to nearest pre-notified medical facility.

(9) Criteria for initiating community alert program, contacts and responsibilities.

(10) Critique of emergency responses and follow-up.

16. Logs, Reports, and Recordkeeping.

a. The following logs, reports, and records shall be developed, retained, and submitted to the CO (or approving authority for in-house activities):

(1) Training logs (site-specific and visitor).

(2) Daily safety inspection logs (may be part of the Daily QC Reports).

(3) Equipment maintenance logs.

(4) Employee/visitor register.

(5) Environmental and personal exposure monitoring/sampling results.

b. All personnel exposure and medical monitoring records are to be maintained in accordance with applicable OSHA standards, 29 CFR 1910 and 1926.

APPENDIX C

Groundwater Monitoring Well Decommissioning Procedures

GROUNDWATER MONITORING WELL DECOMMISSIONING PROCEDURES

October 1996

Prepared for:

New York State Department
of Environmental Conservation

Division of Environmental Remediation

Prepared by:

Malcolm Pirnie, Inc.

DECOMMISSIONING PROCEDURES

NYS SUPERFUND STANDBY CONTRACT
WORK ASSIGNMENT D002852-10

NPL SITE MONITORING WELL DECOMMISSIONING

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

MAY 1995
Revised October 1996

0266-317-002

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DISCLAIMER

October 21, 1996

RE: New York State Department of Environmental Conservation
Division of Environmental Remediation
Monitoring Well Decommissioning Procedures

Per your request, the enclosed referenced document is being made available to you for informational purposes. These procedures may be used as a guidance when decommissioning a monitoring well. Please note that this document does not address some site specific special situations that may be encountered in the field. These procedures have not been adopted by the Department of Environmental Conservation. Compliance with the procedures set forth in this document does not relieve any party of the obligation to successfully and satisfactorily decommission a well.

If you have any questions, please contact Ben Loredo, of my staff, at (518) 457-0927.

Sincerely,

Gerald J. Rider, Jr., P.E.
Chief, Operation, Maintenance and Support Section
Bureau of Hazardous Site Control
Division of Environmental Remediation
New York State Department of Environmental Conservation

Enclosure

INTRODUCTION

Malcolm Pirnie, Inc. has developed hazardous waste site monitoring well decommissioning procedures for the New York State Department of Environmental Conservation (NYSDEC) under the New York State Superfund Standby Contract, Work Assignment No. DOO2852-10. These procedures have been established as a guide for successful decommissioning of wells that are no longer used for monitoring at select National Priorities List (NPL) sites in New York State. A well is successfully decommissioned when:

- Migration of existing or future contaminants into an aquifer or between aquifers cannot occur.
- Migration of existing or future contaminants in the vadose zone cannot occur.
- The potential for vertical or horizontal migration of fluids in the well or adjacent to the well is minimized
- Aquifer yield and hydrostatic head are conserved

The decommissioning procedures are based on NYSDEC-approved methods originally developed by Malcolm Pirnie which entailed an extensive literature search and consultations with industrial and NYSDEC officials. The literature search included sources from the National Ground Water Association, American Society for Testing and Materials (A.S.T.M.), State and EPA guidance documents, Malcolm Pirnie decommissioning procedures, and various other technical sources. A complete listing of sources is included at the end of these procedures. The industry officials consulted include drilling contractors, equipment suppliers and manufacturers, and A.S.T.M. members on Soil and Rock (D-18) and Water (D-19) committees.

These decommissioning procedures describe criteria for a satisfactorily decommissioning a monitoring well. Selection of a preferred decommissioning method will be dependent on site-specific and location-specific conditions such as the type of aquifer, the nature of the contamination, geological conditions and the type of well construction. Prior to initiating field work, the available site and location-specific data will be collected and reviewed, and a pre-construction inspection of the monitoring well will be conducted to assist in determining the best-suited decommissioning method.

For maximum protection of human health and the environment, any material brought to the surface during the decommissioning process will be treated as a hazardous waste unless sample data indicates otherwise. The selection of disposal methods for these materials will depend on information reported in site investigation reports and analytical characterization of the retrieved materials for hazardous characteristics (see Sections 4.1.3 through 4.1.4). An appropriate procedure will be followed for the physical and hydrologic setting of the well that best protects the environment.

The following sections describe the procedures that will be implemented to properly decommission a well, including the procedure for selecting which decommissioning method will be used. There are eleven elements to be addressed in decommissioning a monitoring well at a hazardous waste site:

1) Reviewing Site Data
2) Selecting the Well Decommissioning Method
3) Preparing a Site-Specific Health and Safety Plan
4) Preparing a Materials Handling and Disposal Plan
5) Establishing Decontamination Procedures
6) Locating and Setting-Up on the Well
7) Removing the Protective Casing
8) Decommissioning of Screen and Riser
9) Selecting, Mixing, and Placing Grout
10) Backfilling and Site Restoration
11) Quality Assurance/Quality Control (QA/QC) Procedures

The proper well decommissioning methods and selection process are presented on the flow chart presented as Plate 1. For each decommissioning method, the specific procedures are determined by (1) geology, (2) contaminants, and (3) well design. For example, decommissioning a well that penetrates a confining layer may require a different approach than decommissioning an unconfined water table well.

1.0 REVIEWING SITE DATA

The first step in selecting the well decommissioning process consists of reviewing all pertinent site information; boring and well logs, field inspection sheets, and laboratory analytical results performed on site soil and groundwater samples. This site information will form the basis for decisions throughout the decommissioning process. Field inspection of the wells prior to decommissioning is also recommended to verify the characteristics and conditions of the wells. Special conditions such as access problems, well extensions through capped and covered landfills, and cap conditions due to seasonal weather patterns should be assessed. At well locations that have been extended, the burial of a previous concrete pad may require the excavation of soil to the top of the concrete pad to remove the well. Decommissioning work requiring the use of heavy vehicular equipment on RCRA landfill caps should be scheduled during dry weather if possible so as to minimize damage to the cover. If work must be performed during the Spring, Winter or inclement weather, special measures such as placement of plywood to reduce ruts should be employed to maintain the integrity of the completed landfill cover system. A sample Monitoring Well Field Inspection Log indicating the minimum information to be collected during field verification activities is included as Figure 1.

2.0 SELECTING THE WELL DECOMMISSIONING METHOD

The primary rationale for well decommissioning is to prevent contaminant migration along the disturbed construction zone created by the original well boring. This requires selection of a decommissioning procedure that takes into account factors such as:

- The hydrogeological conditions at the well site.
- The presence or absence of contamination in the groundwater.
- The original well construction details.

This section presents a summary of the well decommissioning methods and the selection process, which is illustrated in the flow chart presented as Plate 1. The primary well decommissioning procedures consist of:

- Casing pulling.
- Overdrilling.
- Grouting the casing in-place.
- Perforating the casing followed by grouting in-place.

A general discussion of each decommissioning procedure is presented in Sections 2.1 through 2.4.

2.1 CASING PULLING

In general, casing pulling is the preferred method for decommissioning wells where: no contamination is present; contamination is present but the well does not penetrate a confining layer; and when both contamination and a confining layer are present but the contamination cannot cross the confining layer. Additionally, the well construction materials and well depth must be such that pulling can be effected without breaking the riser.

Casing pulling involves removing the well casing by lifting. The procedure for removing the casing must allow grout to be added during pulling. The grout will fill the space once occupied by the material being withdrawn. Grout mixing and placement must be performed according to the procedures in Section 9.0.

An acceptable procedure to remove casing involves puncturing the bottom of the casing, flushing with water to remove sand (if necessary to mitigate lock-up of the casing during pulling), filling the casing with grout tremied from the bottom of the well, using jacks to free casing from the hole, and lifting the casing out by using a drill rig, backhoe, crane, or other suitable equipment. Additional grout must be added to the casing as it is withdrawn. In wells or wellpoints in which the bottom cannot be punctured, the casing or screened interval will be perforated prior to being filled with grout. This procedure should be followed for wells installed in collapsible formations or for highly contaminated wells. At site locations in which the borehole does not collapse it may not be necessary to perforate the well casing prior to pulling the well (i.e., grouting the borehole can be completed after the well materials have been removed). However, measurements of the borehole depth must

SITE NAME:

SITE ID.: ________
INSPECTOR: ________
DATE/TIME: ________
WEll ID.: ________

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)		
WELL I.D. VISIBLE?		
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)		

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: ....

	YES	NO
SURFACE SEAL PRESENT?		
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)		
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)		

HEADSPACE READING (ppm) AND INSTRUMENT USED........ ________
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable) ________
PROTECTIVE CASING MATERIAL TYPE: .... ________
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): .... ________

	YES	NO
LOCK PRESENT?		
LOCK FUNCTIONAL?		
DID YOU REPLACE THE LOCK?		
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		
WELL MEASURING POINT VISIBLE?		

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): .... ________
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): .... ________
MEASURE WELL DIAMETER (Inches): .... ________
WELL CASING MATERIAL: .... ________
PHYSICAL CONDITION OF VISIBLE WELL CASING: .... ________
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE .... ________
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES........ ________

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED. ________

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.): ________

REMARKS: ________

be taken before and after the well is pulled to ensure that no collapse of well construction or formation materials occurred.

In the event that the casing or well screen is severed during casing pulling or if borehole collapse occurs, the remaining materials can be removed by overdrilling using the conventional augering method described in Section 2.2. In situations where well materials such as PVC screens and risers are suspected to sever, and removal of all well materials is required (i.e., at wells that are contaminated or those that penetrate an aquiclude), the contractor should install rods inside the well so that the rods would serve as a steel guide pipe for advancing augers during overdrilling.

At sites in which well casings have been grouted into a rock socket the casing pulling procedure may not be feasible. An alternative procedure involving overdrilling into the bedrock, pulling the casing, and subsequently grouting the openhole interval may be employed. For uncontaminated wells or wells with low levels of contamination, overdrilling, grinding on the rock, and grouting inside and outside of the well should be acceptable if the casing cannot be pulled. When this procedure is not acceptable and the casing must be pulled from a contaminated well, a spin and flush drilling technique may be used to advance flushpoint casing equipped with a diamond cutting shoe to the bottom of the casing socket. Water used during the spin and flush casing advancement will be controlled by the use of oversized casing, a coupling and a drilling tee. Drilling water will be containerized and disposed of in accordance with the site specific Material Handling and Disposal Plan.

2.2 OVERDRILLING

Overdrilling is used where casing pulling is determined to be unfeasible, or where installation of a temporary casing is necessary to prevent cross-contamination, such as when a confining layer is present and contamination in the deeper aquifer could migrate to the upper aquifer as the well was pulled (see Section 2.5). The overdrilling method should:

- Follow the original well bore.
- Create a borehole of the same or greater diameter than the original boring.
- Remove all of the well construction materials.

Acceptable methods for overdrilling include the following:

- Using conventional augering (i.e., a hollow stem auger fitted with a plug). The plug cutter will grind the well construction materials, which will be brought to the well surface by the auger.

- Using a conventional cable tool rig to advance casing having a larger diameter than the original boring. The cable tool kit is advanced within the casing to grind the well construction materials and soils, which are periodically removed with large diameter bailer. This method is not applicable to bedrock wells.

- Using an over-reaming tool with a pilot bit nearly the same size as the inside diameter of the casing and a reaming bit slightly larger than the original borehole diameter. This method can be used for wells with steel casings.

- Using a hollow-stem auger with outward facing carbide cutting teeth having a diameter two to four inches larger than the casing. Outward-facing cutting teeth will prevent severing the casing and drifting off center.

- Using a hollow-stem auger with a steel guide pipe inside. The casing guides the cutter head and remains inside the auger. The guide pipe should be firmly attached to the inside of the casing by use of a packer or other type of expansion or friction device.

Prior to overdrilling, an expandable J-plug or other suitable well cap will be used to prevent the introduction of soil or cuttings into the well, thereby ensuring a continuous grout column for wells that are grouted in place.

In all cases above, overdrilling should advance through the original bore depth by a distance of 0.5 feet to ensure complete removal of the construction materials. When the overdrilling is complete, the casing and screen can be retrieved from the center of the auger (American Society for Testing and Materials, Standard D 5299-92, 1992), if one of the hollow stem auger methods described above is employed. Subsequent to overdrilling at flush mount well locations where it may be impractical to remove well materials from inside the augers, a 1-2 foot deep area should be excavated by hand around the flush-mount well to facilitate a conventional well removal while tremie-grouting inside the well. Alternatively, the soil within the annular space may be removed by raising the augers to allow the soil to fall out and re-advance the augers to the original target depth. Grout should then be tremied within the annular space between the augers and well casings. The grout level in the borehole should be maintained as the drilling equipment and well materials are sequentially removed. After overdrilling is completed, the borehole must be grouted according to the procedures in Section 9.0 and the upper five feet of borehole must be restored according to the procedures in Section 10.0.

2.3 GROUTING IN-PLACE

Grouting in-place is the simplest decommissioning procedure, but offers the least long-term protection of all the methods. As discussed in Section 2.5, however, this method is preferred for the bedrock portion of bedrock wells, and is used for decommissioning cased wells in certain situations. For cased wells, the procedure involves filling the casing with grout to a level of five feet below the land surface, cutting the well casing at the five-foot depth, and removing the top portion of the casing and associated well materials from the ground. The casing must be grouted according to the procedures in Section 9.0. In addition, the upper five feet of the borehole is filled to land surface and restored according to the procedures described in Section 10.0.

For wells installed in bedrock, the procedure involves filling the casing (or open hole) with grout to the top of rock according to the procedures in Section 9.0. The grout mix, however, will vary according to the hydrogeological conditions as discussed in Section 2.5.

It should be noted that for wells located on landfills regulated under 6NYCRR Part 360, the screened interval of the well must be sealed separately and hydrostatically tested to ensure its adequacy before sealing the remaining borehole. The Standard Operating Procedure (SOP) for the hydrostatic test has been included under Appendix D.

2.4 CASING PERFORATION/GROUTING IN-PLACE

At this time, casing perforation is the preferred method for wells with four-inch or larger inside diameter which are designated to be grouted in-place in accordance with the selection flow chart. The procedure involves perforating the well casing and screen then grouting the well. A wide variety of commercial equipment is available for perforating casings and screens in wells with four-inch or larger inside diameters. Due to the diversity of application, experienced contractors must recommend a specific technique based on site-specific conditions. A minimum of four rows of perforations several inches long and a minimum of five perforations per linear foot of casing or screen is recommended (American Society for Testing and Materials, Standard D 5299-92, 1992).

After perforating is complete, the borehole must be grouted according to the procedures in Section 9.0 and the upper five feet of borehole must be restored according to the procedures in Section 10.0.

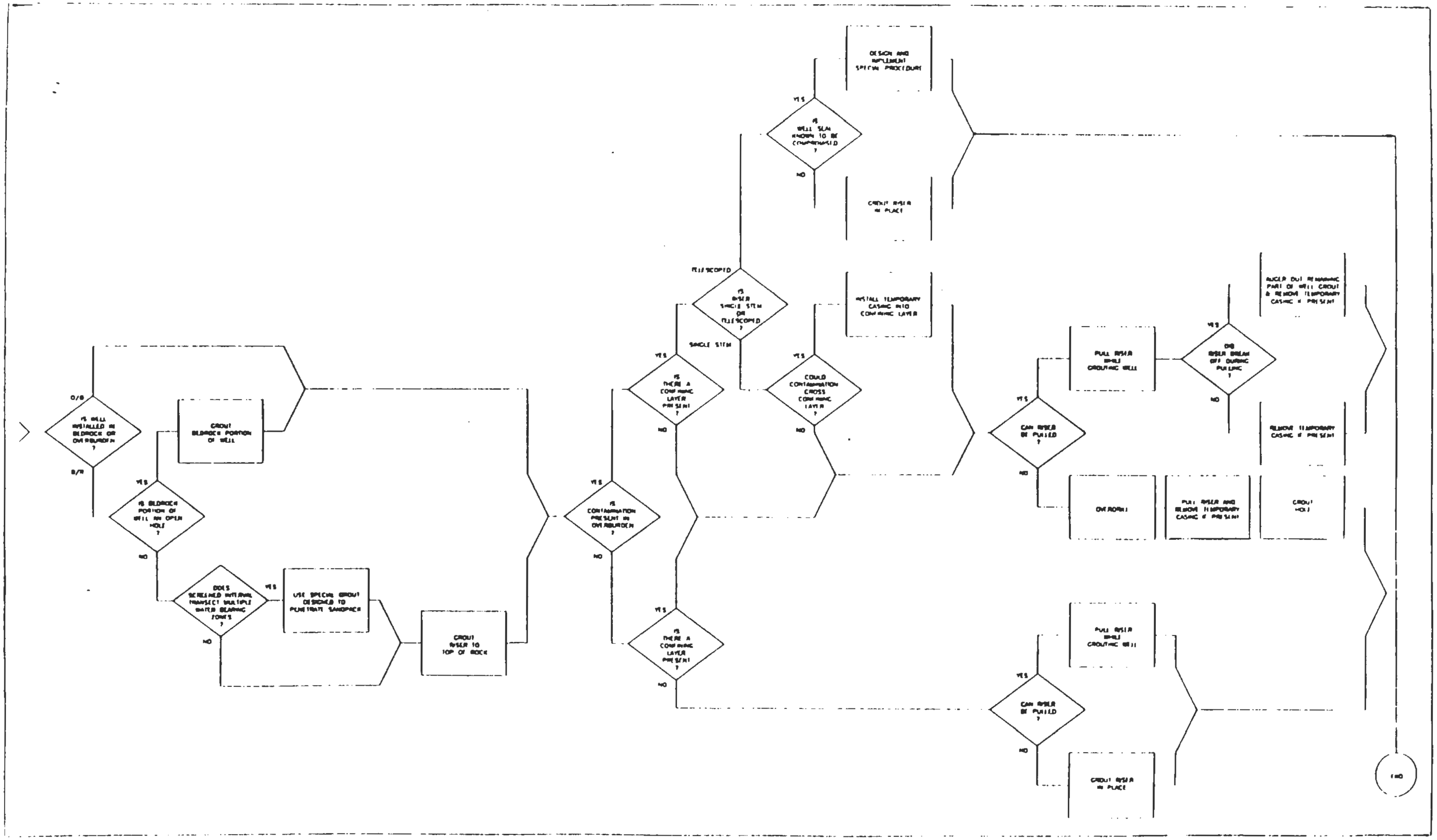
2.5 SELECTION PROCESS AND IMPLEMENTATION

Selection of the decommissioning method is governed by the flow chart presented as Plate 1. A discussion of the selection criteria and decommissioning methodology is presented below.

2.5.1 Contaminated Monitoring Wells/Piezometers

For wells and piezometers suspected or known to be contaminated with NAPL or DNAPL product, measurement of the product volume will be determined using a weighted cotton string or by using an interface probe. Subsequent to calculation of the product volume, the NAPL/DNAPL product will be removed from inside the well. Removal of the contaminant product will be accomplished by bailing, pumping or installing an absorbent passive recovery system. Subsequent to product recovery, all contaminated materials will

PLATE 1



MULTIPLE NPL SITES
WELL DECOMMISSIONING
DECOMMISSIONING PROCEDURE SELECTION
FLOWCHART

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be disposed of in accordance with the segregation and containment procedures described in Section 4.1.2.

2.5.2 Bedrock Wells

As illustrated on Plate 1,if the well is constructed within a bedrock formation, the screened or the open hole portion of the well is grouted to the top of the bedrock. Prior to initiating any grouting procedure, the depth of the well will be measured to determine if any silt or debris infilling has plugged the well. If plugging has occurred, the well will be flushed with an appropriately sized roller bit or drill rods to remove or suspend the obstruction in the water column. The borehole will then be tremie grouted from the bottom of the well to the top of bedrock to insure a continuous grout column. Note that if the bedrock well is cased, the screen should be perforated to the top of the rock if the inside diameter of the casing is 4-inches or larger. Furthermore, if the screened interval transects multiple water bearing zones the special grout mix discussed in Section 9.1.3 should be used to ensure penetration of the sand pack.

After the rock hole is grouted, the overburden portion of the well is decommissioned in accordance with the following sections. If the borehole extends to the surface, no further decommissioning procedures are required; however, the boring should only be filled to within 5-feet of the ground surface and site restoration should be completed in accordance with Section 10.0.

2.5.3 Uncontaminated Overburden Wells

For overburden wells and the overburden portion of bedrock wells, the first decision point in determining the decommissioning method considers whether the overburden portion of the well exhibits evidence of contamination, as determined through historical groundwater and/or soil sampling results. If the overburden portion of the well is uncontaminated, the next criteria considers whether the well penetrates a confining layer. In the case that the overburden portion of the well does not penetrate a confining layer, the casing should be pulled (and tremie-grouted) if possible. As a general rule, PVC wells greater than 25-feet deep should not be pulled unless site-specific conditions or other factors indicate that the well can be pulled without breaking. If the well cannot be pulled, such as in the case that a bedrock portion of the well has already been grouted in place, or if the well materials and depth prohibit pulling or will likely result in breakage, the well should be grouted in-place as accordance with Section 2.3 (if the casing is less than 4-inch in diameter) or Section 2.4 (if the casing diameter is 4-inches or larger).

If the overburden portion of the well penetrates a confining layer, the casing should be removed by pulling (if possible) in accordance with Section 2.1. If the casing cannot be removed by pulling, the well should be removed by overdrilling. The overdrilling method used will depend on the site-specific conditions and requirements. If pulling is attempted and fails (i.e., a portion of the riser breaks) the remaining portion of the well should be removed by using the conventional augering procedure identified in Section 2.2. In all cases, after the well construction materials have been removed, the borehole will be grouted in accordance with Section 9.0 and the upper five feet will be restored in accordance with Section 10.0.

2.5.4 Contaminated Overburden Wells

If an overburden well or the overburden portion of a bedrock well is contaminated as evidenced by historical sampling results, the first decision point in selecting a decommissioning procedure is whether the well penetrates a confining layer. If the well does not penetrate a confining layer, the selection process follows the same pathway as for uncontaminated wells that penetrate a confining layer (i.e., the casing is pulled, if possible; otherwise the well is overdrilled - see Section 2.5.3). Plastic sheeting should be placed around the well surface to contain contaminated materials displaced during removal of the well.

For overburden wells that are contaminated and which penetrate a confining layer, the next selection criteria is whether the well riser is a single stem or is telescoped inside one or more outer casings. The procedures to be followed in determining the decommissioning method are presented for both situations below.

2.5.4.1 Single Stem Riser

If the riser is a single stem, the potential for cross-contamination between confining layers must be addressed. In particular, if the lower confining unit is contaminated, there is a potential that the contamination may be transferred to the upper unit as the well construction materials are removed to the ground surface. In this event, it will be necessary to install a temporary casing having a diameter larger than the original borehole into the top of the confining layer. This may be accomplished using a hollow stem auger or by employing a spin and flush technique to advance the casing. If the confining layer is less than 5 feet thick, the casing should be installed to the top of the confining layer. Otherwise, it is installed to a depth of 2 feet below the top of the confining layer. After the temporary casing has been set, the well can be removed and grouted through pulling (if possible) or through overdrilling if pulling is not feasible. Plastic sheeting should be placed around the well surface to contain contaminated materials displaced during removal of the well. As an alternative to installation of a temporary casing, the hollow-stem auger could serve the same purpose in that it would prevent the contamination from migrating to the upper unit. The hollow-stem auger would be advanced into the confining layer until the joint between the uppermost sections was nearly flush with the ground surface, and the sections would be disconnected to expose the riser prior to pulling or overdrilling.

After the casing and screen are removed and the well is grouted, the temporary casing (if used) is removed and the casing and/or hollow stem auger can be decontaminated for reuse. The upper 5 feet of the well surface should then be restored in accordance with Section 10.0.

2.5.4.2 Telescoped Riser

If the riser is telescoped in one or more outer casings, the decommissioning approach is dependent on the integrity of the well seal. For the purpose of the monitoring well decommissioning procedures, the well seal is defined as the bentonite seal above the sand pack. Although it is not possible to visually inspect or otherwise test the well seal to assess its condition, an indication of the well seal integrity may be obtained through review of the boring logs and/or a comparison of groundwater elevations if the well is part of a cluster. Any problems noted on the boring logs pertaining to the well seal, such as bridging of bentonite pellets or running sands, or disparities between field notes (if available) and the well log would indicate the potential for a poor well seal. Alternatively, if the well is part of a cluster a comparison of groundwater elevations between the shallow and deep wells should also be performed. By observing trends at other clusters it may be possible to identify inconsistencies in groundwater elevations at the well slated for decommissioning, thereby indicating a poor well seal.

If there is no evidence that the well seal integrity is compromised, the riser should be grouted in-place in accordance with Section 2.3 or 2.4, depending on the diameter of the well casing, and the upper 5 feet of the well surface should be restored in accordance with Section 10.0. If indications are that the well seal is not competent, it will be necessary to design and implement a special procedure to remove the well construction materials, as the presence and configuration of the outer casing(s) will be specific in the individual wells and will be a key factor in the decommissioning approach. The special procedure should be designed to mitigate the potential for cross-contamination during removal of the well construction materials, and should be designed prior to initiating field work.

3.0 PREPARATION OF A SITE-SPECIFIC HEALTH AND SAFETY PLAN

Prior to initiating decommissioning activities at a site, it is necessary to prepare a site-specific health and safety plan (HASP) in accordance with the requirements of 29 CFR 1910.120. Accordingly, the HASP should include:

- The names of key personnel responsible for site health and safety, including an appointed site health and safety officer.
- A safety and health risk analysis for each site task and operation.
- Employee training requirements.
- Personal protective equipment (PPE) to be used by employees for each of the site tasks and operations being conducted.

- Medical surveillance requirements.
- Frequency and types of air monitoring, personnel monitoring and environmental sampling techniques and instrumentation to be used.
- Site control measures.
- Decontamination procedures.
- Site standard operating procedures.
- A contingency plan for responses to emergencies.
- Confined space entry procedures.

An example of a health and safety plan is attached as Appendix A. This document provides a general framework for preparing a HASP. Examples of site-specific information, such as names of responsible personnel, contaminant data, and other information which must be developed to meet the OSHA requirements discussed above are included in Appendix A but will need to be modified in the site-specific HASP.

4.0 PREPARATION OF A MATERIALS HANDLING AND DISPOSAL PLAN

Materials handling and disposal procedures for each of the wells slated for decommissioning should be identified in a site-specific materials handling and disposal plan. This plan will be used as a guideline to ensure safe and efficient control of contaminated materials, and will promote conformance with the applicable regulatory requirements for storage, characterization, labeling, transportation and disposal of materials prior to off-site transport.

4.1 MATERIALS HANDLING PROCEDURES

The materials anticipated to be generated during well decommissioning activities include decontamination fluids, disposable safety equipment (including personal protective equipment), drill cuttings, groundwater, well construction materials (PVC and/or stainless steel casings, well screens, sand, bentonite/grout mixtures, etc.), and any spill-contaminated materials. Proper handling of these materials is effected through a series of steps, including: identification/pre-characterization of the waste materials; segregation/containment of the wastes including storage in proper containers; characterization of the waste materials through analytical testing to determine the absence/presence or nature of the contamination, and proper labeling in accordance with 49 CFR Part 172. Each of these steps is described in the following sections.

4.1.1 Identification/Pre-characterization

Prior to initiating well decommissioning activities at a site, the site history, most importantly historical analytical data from the monitoring wells, must be reviewed as well as the monitoring well construction details: number, type (overburden, bedrock), depth, diameter, and construction materials. This knowledge will aid in estimating the nature and quantities of waste materials which potentially may be generated as a result of decommissioning activities and will also assist in pre-determining the number of roll-off boxes, 55-gallon drums, and any other containers necessary to contain the wastes generated at each respective site.

4.1.2 Segregation and Containment

During well decommissioning activities, generated waste materials must be contained and segregated according to the nature of the suspected contamination. Well materials generated from decommissioning those wells with known contamination will be segregated from materials generated from those wells with little to no contamination (based on historical results). Contaminated materials will be further segregated according to contaminant type (e.g., well materials suspected of containing volatile organic contamination will be segregated from materials suspected of containing Polychlorinated Biphenyl (PCB) contamination).

For wells exhibiting contamination, all materials brought to the surface must either be decontaminated, disposed of at an appropriate Treatment, Storage and Disposal Facility

(TSDF), or properly containerized in a secure area for disposal by others. For all uncontaminated wells, the materials (except the casings) can be left at the surface near the former well unless the surrounding land use prohibits this disposal (e.g., if the well is located in an area where people could be exposed to the materials left on the surface; or if recovered decommissioning materials would not be consistent with the intended use of the land). In this case, the materials must be disposed of in a 6NYCRR Part 360 landfill. For contaminated wells, PVC and/or steel casing materials may be decontaminated for disposal in a Part 360 landfill, provided that the decontamination effort is thorough and cost effective. Requirements for characterization and disposal of contaminated materials are discussed in Sections 4.1.3 through 4.1.5.

Containment methods will be based on the estimated quantity of materials anticipated to be generated at each respective site. Solid waste materials (i.e., well construction materials, soils, drill cuttings, PPE), will typically be contained in roll-off boxes or 55-gallon drums. Since federal DOT regulations (49 CFR Part 177) generally limit the combined truck and cargo weight to 80,000 lbs, most hazardous waste transporters will limit the roll-off box capacity to 20 tons of hazardous waste per shipment. Thus, if the materials are to be transported off-site to a treatment, storage and disposal facility (TSDF) that accepts bulk waste, and if the anticipated quantity of waste will be large (greater than 5 tons), water-tight roll-off containers may be more practical and cost-effective for temporarily containing and transporting the waste in lieu or in combination with 55-gallon drums (e.g., 55-gallon drums may still be used for personal protective equipment or other articles not directly derived from the abandoned well). The roll-off containers should be lined with disposable HDPE liners to prevent contact with the container, and will be initially labeled according to the source(s) of the contained waste materials. Likewise, if drums are used they will be lined with a protective plastic sleeve, filled and the drum initially labeled according to the source of the contaminated materials. After the contents of the roll-offs and drums have been characterized, they should be labeled in accordance with 49 CFR Part 172. Roll-off containers will be covered with polyethylene covers and tarps with bows during temporary storage and transportation, and all drums will be sealed.

Fluids generated during the decommissioning program will generally be contained in 55-gallon drums unless extremely large volumes are expected; in this case 5,000-gallon tankers or other suitable temporary storage may be used. All drums will be initially labeled according to the wastewater source(s) and will be assumed to contain the same contaminants as the groundwater measured by the particular monitoring well being decommissioned. All 55-gallon drums containing fluids should be sealed and temporarily stored at the decontamination pad until final off-site disposal at an approved treatment facility.

4.1.3 Characterization

Hazardous waste characterization is necessary to determine the nature of the waste materials, to verify whether the materials are hazardous, and to determine proper disposition. Characterization of waste materials will be conducted at each of the sites to determine the appropriate disposal requirements. The decision as to the number, location and types of samples to be collected will be site specific and will depend on factors such as the quantity of waste generated and type of containers used, the nature of the waste, and the distribution of contaminant types across the site with respect to the origin of the waste materials. In general, the sample collection program will be designed to ensure that analytical data representative of all the materials to be disposed will be generated from the minimal number of samples. This may be accomplished by means such as:

- collection of composite samples for contaminants such as metals and PCBs (compositing is not typically acceptable for volatile organic compound analyses).
- collection of grab samples from select drums/containers suspected of elevated contaminant concentrations based on visual observation (e.g., soil staining, liquid sheen or non-aqueous product) or PID screening

Sample analysis will be based on site history and the requirements of the disposal facility. At a minimum, the samples should be analyzed for the parameters of concern indicated by past monitoring well analytical results, as well as the hazardous waste characteristic parameters: toxicity by TCLP; ignitability; reactivity; and corrosivity in accordance with 40 CFR Part 261.

4.1.4 Labeling

Depending on the nature of the materials, proper labeling of the storage containers (roll-offs and/or drums) must be completed according to 49 CFR Part 172.

4.1.5 Disposal

Disposal of waste materials will depend on whether the waste has been characterized as hazardous or non-hazardous. Non-hazardous waste will be disposed of on-site in accordance with NYSDEC TAGM #4032 with the prior consent of the owner and the Department, or may be landfilled at a permitted 6NYCRR Part 360 facility.

For wastes that exhibit contamination, the requirements for disposal or treatment will be dependent on the waste characteristics. To determine these requirements the following procedure should be followed upon receipt of the waste characterization results:

1) Determine if the waste is characteristically hazardous (by failure of any of the criteria for toxicity, corrosivity, reactivity, or ignitability) or if it is a listed hazardous waste per the classifications identified in 40 CFR Part 261.

2) Determine the EPA hazardous waste code(s) for the applicable waste classification(s) listed in 40 CFR Part 261.

3) Determine any treatment standards for the hazardous waste code(s) per 40 CFR Part 268. Depending on the waste classification, treatment standards may be based on final concentration in the waste/waste extract or may require a specific treatment technology (e.g., incineration).

4) If the hazardous waste contains other constituents that are not listed in the treatment standards, and if landfilling is a disposal option, it should be determined if the waste is a California List waste per the criteria in 40 CFR Part 268.32 (e.g., under these regulations, nonliquid wastes must not contain total halogenated organics at or in excess of 1,000 ppm).

5) If the hazardous waste meets all treatment standards including the California List Standards (if applicable), it may be disposed of at a permitted hazardous

waste land disposal facility. For each shipment the generator is required to provide the following manifest information:

- Hazardous Waste Code(s)
- Corresponding concentration-based or technology-based treatment standards.
- Manifest number.
- Waste analysis data.
- Certification Statement per 40 CFR 268.7(a)(2)(D)(ii).

In addition, the generator is required to maintain the records specified in 40 CFR Part 268.7(a)(7) for a minimum of 5 years.

6) If the waste fails to meet any of the treatment standards listed in 40 CFR Part 268, it must be sent to a treatment, storage, or recycling facility. If the waste's treatment standard is technology-based, it must be treated in accordance with the specified method. Land disposal is not allowable unless the waste is eligible for a National Capacity Variance (40 CFR Subpart C) and meets the California List standards. In all cases, the notification and recordkeeping requirements identified above must be fulfilled by the generator.

The hazardous waste will be transported in accordance with DOT regulations (49 CFR Parts 172-173) to either a secure hazardous waste landfill or TSDF, as appropriate. The contractor will be responsible for arranging for proper transportation and the disposal of the wastes. The Engineer will sign a hazardous waste manifest, as an agent of the Owner.

5.0 EQUIPMENT DECONTAMINATION REQUIREMENTS

Since the monitoring well decommissioning will involve multiple wells, there is a possibility of contamination from one well location to another. To avoid cross-contamination, procedures have been established for decontamination after operations at each well location is complete. The procedures for decontamination of personnel at the site will be specified in the site-specific Health and Safety Plan. Decontamination of equipment will follow established equipment cleaning protocols which are written in accordance with the Engineer's corporate policies and OSHA regulations.

The drilling and excavation equipment (i.e., drill rigs, cutting bits, and associated equipment) will be cleaned at a constructed decontamination facility. In general, the decontamination facility (i.e., decon pad or wash pad) will consist of plywood placed over a heavy synthetic liner. The pad will slope down to a sump that will collect all liquids. A detailed description and drawing of the decontamination facility that will be constructed is included in Appendix B as Item 1.

The drilling and excavation equipment will be prepared before it is brought to the decontamination facility and then cleaned at the facility. The preceding preparation includes removing gross soil/rock from the equipment to minimize losses during movement to the decon pad. At the decontamination facility, the equipment will be rinsed with low-volume water or steam, washed with phosphate-free detergent, and rinsed again with pressurized low-volume water or steam. The equipment will be inspected by the Engineer's field representative after cleaning. The detailed cleaning procedures are included in Appendix B as Item 2.

In the event that sampling equipment must be used, the decontamination guidelines included in Appendix B as Item 3 will be followed. In general, these guidelines describe cleaning with non-phosphate detergent, then performing rinsing cycles with water and acid. After the equipment is air-dried, it must be wrapped in aluminum foil to avoid accidental contamination after cleaning.

After all equipment is decontaminated, the solutions produced must be properly containerized and disposed of. All other disposable contaminated supplies/equipment such as disposable safety and sampling equipment will also need to be properly disposed of. Unless characterization of the decon fluids and disposable equipment is performed in accordance with Section 4.0, these materials will be handled in the same manner as the drill cuttings/fluids from the well locations. All materials must be temporarily stored in a secure area such as the fenced decon pad.

If sampling is necessary, the Engineer's personnel will be responsible for the decontamination of the sampling equipment. The decontamination of drilling and excavation equipment is the responsibility of the Contractor(s). The Engineer's field representative will make daily inspections to insure that decontamination procedures are being followed.

6.0 LOCATING AND SETTING-UP ON THE WELL

The following tasks shall be performed to locate the well to be decommissioned:

- Notify property owner and/or other interested parties including the governing regulatory agency prior to site mobilization whenever possible.
- Review information about the well contained in the site file. This information may include one or more of the following: the site map, well boring log, well construction diagram, field inspection log, well photograph, and proposed well decommissioning procedure.
- Verify the well location and identification by locating the identifying marker.
- Verify the depth of the well in the well construction log by sounding with a weighted tape.

After the well has been located, the decommissioning procedure should be selected in accordance with Section 2.0 based on the available boring and sampling data. The rig must be set up prior to initiating drilling to ensure proper alignment with the well (i.e., the drill string must be aligned with the monitoring well).

7.0 REMOVING THE PROTECTIVE CASING

7.1 GENERAL

Removal of the protective casing of a well must not interfere with or compromise the integrity of decommissioning activities performed at the well.

The procedure for removing the protective casing of a well depends upon the decommissioning method used. When a well is decommissioned by the overdrilling or casing pulling method, the protective casing may be removed either before or after the casing is removed. When the decommissioning procedure requires casing perforation or grouting in-place, the protective casing should be removed after grout is added to the well. The protective casing handling and disposal must be consistent with the methods used for the well materials, unless an alternate disposal method can be employed (e.g., steam cleaning followed by disposal as nonhazardous waste).

7.2 PRIOR TO SEALING THE WELL BORE

When overdrilling, the protective casing must be removed first, unless the drilling tools have an inside diameter larger than the protective casing. The variety of protective casings available preclude developing a specific removal procedure. In all cases, however, the specific procedure used must minimize the risk of:

- breaking the well casing off below ground and
- allowing foreign material to enter the well casing.

If the decommissioning method used is casing pulling, the decision of when to remove the protective casing is not critical.

An acceptable protective casing removal method involves breaking up the concrete seal surrounding the casing and jacking or hoisting the casing out of the ground. A check should be made during pulling to insure that the inner well casing is not being hoisted with the protective casing. If this occurs, the well casing should be cut off after the base of the protective casing is lifted above the land surface.

7.3 AFTER SEALING THE WELL

If the decommissioning method used allows well casing to remain in the ground, the protective casing should be removed after the well has been properly filled with grout. This will insure that the well is properly sealed regardless of problems with protective casing removal. During grouting in-place, the well casing must be removed to a depth of five feet below the land surface. The upper five feet of casing and the protective casing can be removed in one operation if a casing cutter is used. If the height of the protective casing makes working conditions at the well awkward, the casing can be cut off at a lower level. However, the inner well casing must remain aboveground and cannot be damaged in any way that prevents the well from being filled with grout.

8.0 DECOMMISSIONING OF SCREEN AND RISER

After setting up on the well and removing the protective casing (if necessary), the well screen and riser are decommissioned in accordance with the appropriate procedure and methodology as discussed in Section 2.0 (i.e., if the wells are overdrilled or pulled, the casing and riser are removed. Otherwise, they are perforated and/or grouted in-place). During the decommissioning activities the requirements of the site-specific health and safety plan, materials handling and disposal plan and equipment decontamination plan will be followed to ensure maximum protection of human health and the environment.

9.0 SELECTING, MIXING, AND PLACING GROUT

9.1 SELECTING GROUT MIXTURE

There are two types of grout mixes that may be used to seal wells: a standard mix and a special mix. Both mixes use Type 1 Portland cement and four percent bentonite by weight. However, the special mix uses a smaller volume of water and is used in situations where excessive loss of the standard grout mix is possible (e.g. highly-fractured bedrock or coarse gravels).

9.1.1 Standard Grout Mixture

For most boreholes, the following standard mixture will be used:

- One 94-pound bag Type I Portland cement
- 3.9 pounds powdered bentonite
- 7.8 gallons potable water

This mixture results in a grout with a bentonite content of four percent by weight, and will be used in all cases except in boreholes where excessive use of grout is anticipated. In these cases a special mixture will be used (see Section 9.1.2).

See Section 9.2 for grout mixing procedures.

9.1.2 Special Mixture

In cases where excessive use of grout is anticipated, such as high permeability formations and highly fractured or cavernous bedrock formations, the following special mixture will be used:

- One 94-pound bag type I Portland cement
- 3.9 pounds powdered bentonite
- 1 pound calcium chloride
- 6.0-7.8 gallons potable water (depending on desired thickness)

The special mixture results in a grout with a bentonite content of four percent by weight. It is thicker than the standard mixture because it contains less water. This grout is expected to set faster than the Standard Grout Mixture. The least amount of water that can be added for the mixture to be readily pumpable is six gallons per 94-pound bag of cement.

See Section 9.2 for grout mixing procedures.

9.1.3 Alternate Special Grout

In cases where the penetration of the sandpack is critical, such as bedrock wells with screens that transect multiple water-bearing zones, the following alternate mixture will be used:

- One 94 pound bag Type III Portland Cement.
- 3.9 pounds powdered bentonite.
- 7.8 gallons potable water.

Refer to Section 9.2 for grout mixing procedures. It should be noted that this grout is expected to set faster than the standard grout mixture.

9.2 GROUT MIXING PROCEDURE

To begin the grout-mixing procedure, calculate the volume of grout required to fill the borehole. If possible, the mixing basin should be large enough to hold all of the grout necessary for the borehole. Tall cylindrical and long shallow basins should not be used as it is difficult to obtain a homogeneous mixture in these types of basins.

Mix grout until a smooth, homogeneous mixture is achieved. No lumps or dry clots should be present. Grout can be mixed manually or with a mechanized mixer. One acceptable type of mixer is a vertical paddle grout mixer. Colloidal mixers should not be used as they tend to excessively decrease the thickness of the grout for the above recipes.

9.3 GROUT PLACEMENT

Grout will be placed in the borehole from the bottom to the top using a tremie pipe of not less than 1-inch diameter. Grout will then be pumped into the borehole until the grout appears at the land surface (when grouting open holes in bedrock, the grout level only needs to reach above the bedrock surface). Any groundwater displaced during grout placement will be pumped via suction lift to a 55-gallon drum for proper disposal.

At this time the rate of settling should be observed. When the grout level stabilizes, casing or augers will be removed from the hole. As each section is removed, grout will be added to keep the level between 0-feet and 5-feet below land surface. If the grout level drops below the land surface to an excessive degree, an alternate grouting method must be used. One possibility is to grout in stages; i.e., the first batch of grout is allowed to partially cure before a second batch of grout is added.

Upon completion of grouting, insure that the final grout level is approximately five feet below land surface. A ferrous metal marker will be embedded in the top of the grout to indicate the location of the former monitoring well.

10.0 BACKFILLING AND SITE RESTORATION

The uppermost five feet of the borehole at the land surface will be filled with a material appropriate to the intended use of the land. The materials will be physically similar to the natural soils. No materials will be used that limit the use of the property in any way. The surface of the borehole will be restored to the condition of the area surrounding the borehole. For example, concrete or asphalt will be patched with concrete or asphalt of the same type and thickness, grassed areas will be seeded, and topsoil will be used in other areas. All solid waste materials generated during the decommissioning process will be disposed of properly.

11.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROCEDURES

This section describes the quality control/quality assurance (QA/QC) procedures necessary for monitoring and ensuring the Contractor's adherence to the Monitoring Well Decommissioning Project procedures, plans and specifications, prepared by the Engineer. This section will discuss the minimum inspection and documentation requirements necessary to facilitate proper well decommissioning procedures and also will:

- Review the general requirements specified in the Contract Documents.
- Define roles and responsibilities of all parties.
- Establish the key tasks to be monitored by the on-site construction inspector and the appropriate inspector forms and logs to be used for recording the Contractor's activities.
- Establish procedures for communicating change orders, field modifications and variations from the Contract Documents to the Owner.
- Establish scheduled meetings and briefings during the construction phase.

The overall goal of the project QA/QC program is to ensure that proper well decommissioning techniques and procedures are used in accordance with the requirements of the Contract Documents. The QA/QC procedures herein should be followed by QA personnel including: Construction Contractor personnel, the Contractor's subcontracted laboratory and field personnel, and the Engineer's on-site construction inspector.

11.1 RESPONSIBILITY AND AUTHORITY

The principal organizations involved in developing, designing and conducting well decommissioning activities are the Owner, Engineer, and the Construction Contractor.

11.1.1 Owner

The Owner will be responsible for reviewing the well decommissioning procedures to determine whether the documents meet their requirements, and to obtain approval of the procedures from the appropriate regulatory agencies. The Owner will have the responsibility and authority to review and accept or reject any design or procedural revisions or requests. The Owner also has the responsibility and authority to review and approve the Construction Monitoring Report and all QA documentation collected during well decommissioning activities.

11.1.2 Engineer

The Engineer will be responsible for reviewing and approving any engineering design changes, construction monitoring and quality assurance in accordance with this QA Plan. The Engineer will inform all parties involved with construction of their responsibilities, lines of communication, lines of authority, and QA/QC procedures. The Engineer's construction inspector (QA Engineer) will monitor decommissioning activities and will be assigned specific responsibilities and tasks. Most of the waste sample collection and testing will be conducted by the contractor at a frequency and manner specified in the site specific Materials Handling and Disposal Plan.

The person filling the construction inspector (QA Engineer) position will be trained and certified to operate an HNu organic vapor photoionization detector (PID), will be OSHA 40-hour Hazardous Waste Worker trained and will have a working knowledge of documents pertaining to well decommissioning activities, including this plan. The Engineer's field personnel will be instructed to contact the construction inspector (QA Engineer) in the event well decommissioning requirements are not being met, QA procedures are not being implemented, or construction problems have been encountered.

11.1.3 Construction Contractor

In addition to performing the monitoring well decommissioning in accordance with the design documents, the Contractor will be required to obtain the services of a qualified testing laboratory to perform the analytical testing of the waste materials and will also be responsible for procuring transportation and disposal/treatment services.

11.2 PROJECT MEETINGS

The Engineer's management of the monitoring well decommissioning project will include conducting periodic project meetings as described below:

11.2.1 Pre-construction Meeting

The Engineer will schedule and attend one (1) pre-construction meeting for the purpose of discussing the project approach and answering contractor questions. The Engineer will also prepare and distribute meeting minutes. The meeting will also:

- Provide each party (organization) with relevant QA documents and supporting information.
- Familiarize each organization with the QA Plan and its role relative to the well decommissioning criteria and construction documents.
- Review the responsibilities of each organization and review the lines of authority and communication for each organization.
- Discuss the established procedures for observations and tests including waste sampling.

- Discuss the established procedures for handling construction deficiencies, repairs, and/or retesting.

- Review methods for documenting and reporting inspection data.

11.2.2 Monthly Progress Meetings

Monthly project meetings will be held during the course of the work to discuss the project schedule and work performed to date, and to address and resolve any existing or anticipated problems.

A special meeting will be held when and if a major QA problem or deficiency is present or likely to occur. At a minimum, the meeting shall be attended by the Construction Contractor and the Engineer's on-site inspector (QA Engineer). The purpose of the meeting will be to define and resolve the problem(s) or deficiencies encountered. The meeting minutes will be documented by the Engineer.

11.3 KEY TASKS

The key tasks that the Engineer will conduct during the well decommissioning project are briefly summarized below.

11.3.1 Review of Contractor Submissions

Prior to well decommissioning activities, all written submissions required by the contract documents will be evaluated and forwarded to the Owner, together with written submissions regarding their suitability. The Engineer will also obtain and review all necessary shop drawings, material tests and as-built drawings submitted throughout the construction and will make recommendations for acceptance/rejection to the Owner. The contractor's progress will be continuously monitored during the construction period, and Owner will be informed of the schedule and any corrective measures planned or implemented.

Throughout the project, payment requests by the contractor will be reviewed for accuracy and completeness prior to making recommendations relative to payment. Review will involve comparing actual notes of field personnel to items contained in the payment request. Discrepancies will be discussed with the contractor and will be amended if necessary.

11.3.2 Construction Inspection

The Engineer will provide full-time inspection of the contractor during all critical well decommissioning activities at each of the sites. This will be accomplished by providing an experienced on-site inspector(s) to document the contractor's adherence to the contract specifications and monitoring the contractor's progress. The Engineer will notify the Owner in the event that the contractor fails to perform the decommissioning work as specified in the contract and recommend to the Owner the acceptance, conditional approval/disapproval or rejection of the contractor's work. The Engineer will issue instructions, field orders, interpretations and clarification of contract language to the contractor as required. In the event that a change order is necessary, the Engineer will submit the change order with a detailed cost estimate to the Owner. The Engineer will also document, evaluate and recommend a course of action for all disputes and claims with the contractor.

In addition, the Engineer will inspect, evaluate and document the monitoring well condition after the well has been removed.

11.4 DOCUMENTATION

The Engineer's on-site construction inspector will document all monitoring well decommissioning activities. Such documentation will include, at a minimum, daily reports of construction activities, photographs, and sketches as necessary. Field investigation reports will be completed by the construction inspector when major questions arise at the site. Forms to be used for this purpose are presented in Appendix C.

The Engineer will maintain complete and detailed records associated with all construction and related activities during the duration of the project. These records will be maintained at the Engineer's office(s) and will include but not be limited to the following:

- Daily work completed and important conversations.
- Contractor's daily use of personnel, material and equipment.
- Records documenting the contractor's deviation from work as specified in the contract documents, and any instructions issued regarding deviations.
- Unusual circumstances (weather conditions, labor disputes, environmental problems, health and safety hazards encountered, etc.).
- General files including correspondence and other documentation related to the project.
- Job meeting minutes with documentation on resolution of issues raised.
- Records of contractor's submittals including shop drawings, modifications/change orders, soil tests, material tests and action taken (e.g.,Owner approval/disapproval, further information needed).
- Construction photos.
- Telephone conversation

In addition, the Engineer will submit monthly Project Summary Reports to the Owner. These reports will identify the work which has been accomplished and will document the status of each monitoring well at each site where decommissioning work has occurred.

Upon substantial completion of the decommissioning activities at each site, the Engineer will prepare a detailed list of any work remaining unfinished. The Engineer will then prepare and submit a written notice to the Owner which will include a determination as to whether the completed work meets the requirements of the contract documents. Following satisfactory completion of the work, the Engineer will perform a final inspection of the site and submit a notice to the Owner that decommissioning activities were performed in accordance with the contract documents as revised by any approved change orders or modifications to the scope of work.

Documentation on the condition of the removed wells with respect to the impacts of hazardous waste, minerals and other pertinent environmental factors, or discernable through direct observation, will be presented to Owner along with any recommendations for future well installation techniques and materials.

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APPENDIX D

CONTRACT DATA REQUIREMENTS LIST
DD FORM 1423

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO. | B. EXH/ATCH NO. | C. CATEGORY: TDP ____ TM ____ OTHER ____

D. SYSTEM/ITEM | E. CONTRACT/PR NO. | F. CONTRACTOR

---

1. DATA ITEM NO.: A001
2. TITLE OF DATA ITEM: Sampling and Analysis Plan (SAP)
3. SUBTITLE:
4. AUTHORITY (Data Acquisition Document No.):
5. CONTRACT REFERENCE:
6. REQUIRING OFFICE:
7. DD 250 REQ:
8. APP CODE:
9. DIST STATEMENT REQUIRED:
10. FREQUENCY:
11. AS OF DATE:
12. DATE OF FIRST SUBMISSION: 10 days after award
13. DATE OF SUBSEQUENT SUBMISSION: 30 days after award
14. DISTRIBUTION: a. ADDRESSEE | b. COPIES: Draft | Final: Reg | Repro
15. TOTAL →
16. REMARKS:

SAP prepared in accordance with EM-200-1-3

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

---

1. DATA ITEM NO.: A002
2. TITLE OF DATA ITEM: Certification of Health & Safety Program (HSP)
3. SUBTITLE:
4. AUTHORITY (Data Acquisition Document No.):
5. CONTRACT REFERENCE:
6. REQUIRING OFFICE:
7. DD 250 REQ:
8. APP CODE:
9. DIST STATEMENT REQUIRED:
10. FREQUENCY:
11. AS OF DATE:
12. DATE OF FIRST SUBMISSION: 10 days after award
13. DATE OF SUBSEQUENT SUBMISSION:
14. DISTRIBUTION: a. ADDRESSEE | b. COPIES: Draft | Final: Reg | Repro
15. TOTAL →
16. REMARKS:

A written certification of the development and implementation of the HSP in accordance with 29 CFR 1910.120 shall be submitted.

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

---

1. DATA ITEM NO.: A003
2. TITLE OF DATA ITEM: Site Health & Safety Plan (SSHP)
3. SUBTITLE:
4. AUTHORITY (Data Acquisition Document No.):
5. CONTRACT REFERENCE: SOW - Section C, 3.2.2
6. REQUIRING OFFICE:
7. DD 250 REQ:
8. APP CODE:
9. DIST STATEMENT REQUIRED:
10. FREQUENCY:
11. AS OF DATE:
12. DATE OF FIRST SUBMISSION: 10days after award
13. DATE OF SUBSEQUENT SUBMISSION: 30 days after award
14. DISTRIBUTION: a. ADDRESSEE | b. COPIES: Draft | Final: Reg | Repro
15. TOTAL →
16. REMARKS:

SSHP prepared in accordance with requirements of EM 385-1-1 and 29 CFR 1910.120. Plus a UXO Avoidance Work Plan.

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

---

1. DATA ITEM NO.: A004
2. TITLE OF DATA ITEM: Work Plan
3. SUBTITLE:
4. AUTHORITY (Data Acquisition Document No.):
5. CONTRACT REFERENCE: SOW - Section C, 3.2.1
6. REQUIRING OFFICE:
7. DD 250 REQ:
8. APP CODE:
9. DIST STATEMENT REQUIRED:
10. FREQUENCY:
11. AS OF DATE:
12. DATE OF FIRST SUBMISSION: 20 days after award
13. DATE OF SUBSEQUENT SUBMISSION: 40 days after award
14. DISTRIBUTION: a. ADDRESSEE | b. COPIES: Draft | Final: Reg | Repro
15. TOTAL →
16. REMARKS:

A detailed work plan documenting the proposed equipment, procedures and subcontractors to be used.

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

G. PREPARED BY | H. DATE | I. APPROVED BY | J. DATE

APPENDIX E

DATA ITEM DESCRIPTIONS
DD FORM 1664

DATA ITEM DESCRIPTION		Form Approved OMB No. 0704-0188	
2. Title Sampling and Analysis Plan (SAP)		1. Identification Number 1	
3. Description/Purpose The SAP shall provide detailed information on chemical QA/QC during execution of this contract.			
4. Approval Data	5. Office of Primary Responsibility (OPR)	6a. DTIC Applicable	6b. GIDEP Applicable
7. Application/Interrelationship			
8. Approval Limitation		9a. Applicable Forms	9b. AMSC Number
10. Preparation Instructions The Contractor shall comply with the EM-200-1-3 to prepare and submit the SAP.			
11. Distribution Statement			

DATA ITEM DESCRIPTION			Form Approved OMB No. 0704-0188
2. Title Written Certification of Health and Safety Program (HSP)			**1. Identification Number** 2
3. Description/Purpose Certification of the development and implementation of HSP.			
4. Approval Data	**5. Office of Primary Responsibility (OPR)**	**6a. DTIC Applicable**	**6b. GIDEP Applicable**
7. Application/Interrelationship			
8. Approval Limitation		**9a. Applicable Forms**	**9b. AMSC Number**
10. Preparation Instructions The Contractor shall prepare and submit a written certification that a Health and Safety Program (HSP) has been developed, implemented and maintained.			
11. Distribution Statement			

DATA ITEM DESCRIPTION			**Form Approved OMB No. 0704-0188**
2. Title Site specific Health and Safety Plan (SSHP)			**1. Identification Number** 3
3. Description/Purpose The SSHP shall provide detailed information on safety at SEDA during the execution of the contract.			
4. Approval Data	**5. Office of Primary Responsibility (OPR)**	**6a. DTIC Applicable**	**6b. GIDEP Applicable**
7. Application/Interrelationship			
8. Approval Limitation		**9a. Applicable Forms**	**9b. AMSC Number**
10. Preparation Instructions The Contractor shall prepare the SSHP in accordance with EM385-1-1, 29 CFR 1910 and 1926, Appendix B. The SSHP shall address the elements described in Appendix B. The services of a Certified Industrial Hygienist experienced in hazardous waste site operation shall be utilized to oversee the development and implementation of the SSHP. In addition the Contractor (or his subcontractor) shall prepare a UXO Avoidance work plan.			
11. Distribution Statement			

DATA ITEM DESCRIPTION		Form Approved OMB No. 0704-0188	
2. Title Work Plan		1. Identification Number 4	
3. Description/Purpose Documentation on the proposed equipment, procedures and subcontractors to be used during the project.			
4. Approval Data	5. Office of Primary Responsibility (OPR)	6a. DTIC Applicable	6b. GIDEP Applicable
7. Application/Interrelationship			
8. Approval Limitation		9a. Applicable Forms	9b. AMSC Number
10. Preparation Instructions The Contractor shall provide a detailed workplan for the owner's review prior to mobilization. The work plan shall provide the information specified in Section 3.1.			
11. Distribution Statement			

DATA ITEM DESCRIPTION			Form Approved OMB No. 0704-0188
2. Title Weekly Progress Reports			**1. Identification Number** 5
3. Description/Purpose Weekly progress reports will be used to monitor the actual progress of the contractor. These reports will be the basis for progress payments.			
4. Approval Data	**5. Office of Primary Responsibility (OPR)**	**6a. DTIC Applicable**	**6b. GIDEP Applicable**
7. Application/Interrelationship			
8. Approval Limitation		**9a. Applicable Forms**	**9b. AMSC Number**

10. Preparation Instructions

The Contractor shall issue a weekly progress report which shall include the following information:

1. Weight of treated soil processed for the week and cumulative.
2. Weight of treated soil passing the treatment standard for the week and cumulative.
3. Weight of the debris shipped off site for disposal for the week and cumulative.
4. Volume of wastewater collected, treated and discharged for the week and cumulative.
5. Site plan updated monthly with treated areas highlighted.
6. Weight tickets.
7. Laboratory Reports.
8. Air monitoring results.
9. Manifests for material shipped offsite.

11. Distribution Statement

DATA ITEM DESCRIPTION			Form Approved OMB No. 0704-0188
2. Title Final Reports		**1. Identification Number** 6	
3. Description/Purpose The final report shall document that the contractor has successfully completed the SEDA open burning grounds remedial action.			
4. Approval Data	**5. Office of Primary Responsibility (OPR)**	**6a. DTIC Applicable**	**6b. GIDEP Applicable**
7. Application/Interrelationship			
8. Approval Limitation		**9a. Applicable Forms**	**9b. AMSC Number**

10. Preparation Instructions

The final report shall contain the following information:

1. Description of work completed with weight of soil processed, weight of debris disposed shipped off site, volume of water treated and discharged.
2. As built site plan with limits of excavation, sample locations and limits of the soil cover.
3. Laboratory reports and summary tables.
4. Air monitoring results.
5. Daily logs with weight tickets.
6. Manifests for material disposed offsite.
7. Surveyor report defining the limits of the treated area.
8. Monitoring well installation documentation.

11. Distribution Statement

Appendix F
UXO Avoidance Work Plan

ABBREVIATED SITE SAFETY and HEALTH PLAN (ASSHP)
UXO AVOIDANCE PLAN

UXO CLEARANCE SERVICES
for
REMEDIAL DESIGN at the OB GROUNDS

SENECA ARMY DEPOT ACTIVITY, ROMULUS, NEW YORK

Prepared for:
Parsons Engineering Science
30 Dan Road
Canton, MA 02021

Prepared By:
UXB International, Inc.
21641 Beaumeade Circle
Suite 301
Ashburn, Virginia 20147-6002

July 30, 1998

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 General

Direction and administration of Work Plan Procedures are a corporate responsibility, while implementation in a safe and efficient manner is the direct responsibility of all UXO personnel. This task-specific Work Plan (WP) pertains to the completion of certain Unexploded Ordnance (UXO) avoidance related services during environmental site inspections and remedial investigations by others. This WP was prepared in accordance with the guidelines set forth in three publications of the U. S. Army Engineering and Support Center, Huntsville Division, Ordnance and Explosive Center of Expertise (CX) -- ***Generic Statement of Work (For UXO Avoidance), Safety Concepts and Basic Considerations for Unexploded Explosive Ordnance (UXO) Operations*** (February 16, 1996), and ***Personnel and Work Standards for Ordnance Response*** (July 30, 1996).

These guidelines are based on a review of available information and an evaluation of potential hazards. This WP is tailored to the usual anticipated situations and level of effort required to complete UXO avoidance related services. This plan describes health and safety procedures and the equipment required to minimize the potential for hazardous exposures during these activities. Adherence to the requirements of this WP will significantly reduce, but not eliminate, the potential for occupational injury and illness at each work area. Careful research will promote the discovery, evaluation, and protection against most possible hazards which may be encountered during completion of this work activity; however, should operational circumstances substantially differ from those described and/or anticipated, activities shall be temporarily terminated until the suspect hazards are evaluated and appropriate health, safety, and operational precautions are implemented.

This Work Plan is designed to address only UXO-related tasks; as such, it will supplement the existing Work Plan developed by Parsons Engineering Science (PES).

1.2 Purpose

This WP establishes procedures, guidelines, and general safety precautions to be followed by all UXO personnel when performing UXO operations during site inspection remedial investigations and site remediation in areas with potential UXO contamination. This WP includes procedures for additional RI activities that are not currently scheduled. These procedures are included in this plan to facilitate future task order modifications.

1.3 Description

Seneca Army Depot is an inactive army installation that dates back to 1941. Seneca Army Depot is situated in the heart of New York's Finger Lakes region, near the geographical center of the state. Located on more than 10,000 acres, the installation sits along the eastern shore of Seneca Lake, approximately 15 miles south of the town of Geneva, New York.

The OB Grounds is a 30 acre site that has been used for demilitarization operations and has been been the subject of a remedial investigation and a feasibility study.

2.0 SCOPE OF WORK

2.1 Description of Tasks

UXO personnel will provide UXO clearance and avoidance procedures in supporting the remediation contractor's scope of work as summarized in section 3.0.1 of the main Section C document.

2.2 Work Schedule

The work schedule for this project at Seneca Army Depot will be determined by PES. When performing intrusive, UXO related operations, UXO personnel shall be limited to 10-hours per work day and 40-hours per work week.

3.0 ORGANIZATION/RESPONSIBILITY

3.1 Project Organizational Structure

One on-site team (the "UXO team") shall conduct the required services at Seneca Army Depot.

The team shall consist of two personnel: a UXO Team Leader (UXO Supervisor) and a UXO Team Member (a UXO Specialist). All project personnel shall possess the specialized expertise required to accomplish the tasks set forth in the Statement of Work.

3.2 Responsibilities of Personnel

The responsibilities of UXO team personnel are as follows:

3.2.1 UXO Team Leader (UXO Supervisor)

The UXO Team Leader is the most senior UXO-qualified individual on-site. This person:

- implements and executes the tasks outlined in the Statement of Work
- assures that all personnel are briefed daily on health and safety requirements
- monitors all aspects of UXO related activities and Ordnance and Explosive (OE) characterization and investigation
- continually evaluates operations to determine the effectiveness and efficiency of established procedures.
- prepares daily field reports and logs of all on-site activities and recommends implementation of corrective actions as necessary
- is the final authority for on-site personnel regarding all matters concerning UXO and can temporarily stop UXO related operational activities to correct safety deficiencies
- monitors ordnance related work performance of operational personnel to assure observance of all UXO related safety and health rules
- maintains records on all UXO related health and safety issues and assures reportable accident and incident reports are submitted in a timely manner

3.2.2 UXO Team Member (UXO Specialist)

As a Team Member, the UXO Specialist:

- is responsible for safely conducting all site inspection and remedial investigation support activities as assigned by the UXO Team Leader
- is responsible for the ordnance related safety of all non-EOD personnel in his accompaniment
- can temporarily stop UXO related operational activities to correct safety deficiencies

3.3 Visitors

Visitors not directly involved with site inspection and remedial investigations within the project boundaries are not permitted on-site without prior written notice from PES. The UXO Team Leader shall be notified 24-hours prior to any planned visit. Such notice shall include the identity, number of visitors in the party, duration of visit, and purpose of visit. All UXO operations will cease any time a non-UXO qualified visitor is in the exclusion zone.

4.0 TRAINING REQUIREMENTS

4.1 Health and Safety Indoctrination

All personnel involved in site inspection and remedial investigation activities will receive safety and health indoctrination and continuing training to enable them to perform their assigned tasks safely and efficiently. All personnel will be required to read the project Site Safety and Health Plan (SSHP) and this WP prior to working on the site. They shall acknowledge their understanding of both documents by signing a Work Plan Acknowledgment Form.

Morning Safety Meetings will be conducted daily to inform all personnel of daily objectives, planned operations, and associated specific hazards. The Morning Safety Meetings are described in **Section 6.1.1** of this WP.

Personnel will be encouraged to keep the lines of communications between the field operations personnel and supervisors open to permit the free flow of information and exchange of ideas to enhance operations.

4.2 Site Specific Training

All operational personnel assigned to or entering the project site will have received the required training to safely complete the activities outlined in this WP. Site Specific Training will consist of: hazards communication, names of personnel responsible for site health and safety; known health and safety hazards on-site; use of personal protective equipment (PPE); safe work practices expected; safe and effective use of equipment on-site; and medical surveillance requirements including recognition of symptoms and signs of exposure to hazards, decontamination procedures, and emergency response plan. The individual conducting Site Specific Training will document this training.

Certain UXO Team Members may be required to operate mechanical excavation equipment. Any UXO Team Member performing this task will have prior documented experience in the operation of mechanical excavators and shall have completed proper training in the operation and maintenance of the respective equipment.

4.2.1 Unexploded Ordnance (UXO) Training

Only UXO qualified personnel will be involved in UXO procedures. All personnel involved in the handling of UXO will be graduates of the U.S. Naval School of Explosive Ordnance Disposal, Indian Head, Maryland.

The UXO Team Leader will review all available data relating to UXO anticipated to be found on-site. All operational personnel will be refreshed on the recognition of the UXO items identified during the archival search. As additional UXO are encountered, training will be provided to assure all personnel are alerted to the additional hazards.

Operational personnel will also be briefed on the hazards associated with electroexplosive devices (EED) and their susceptibility to electromagnetic radiation (EMR) in the radio frequency (RF) range.

4.2.1.1 UXO Team Leader (UXO Supervisor)

The UXO Team Leader shall be a graduate of the U.S. Naval School of Explosive Ordnance Disposal, Indian Head, Maryland, and have a minimum of 10 years of combined active-duty military EOD and contractor UXO experience. The UXO Team Leader shall also have documented experience in supervising range clearance operations and personnel management.

4.2.1.2 UXO Team Member (UXO Specialist)

The UXO Team Member shall be a graduate of the U.S. Naval School of Explosive Ordnance Disposal, Indian Head, Maryland.

4.2.2 OSHA Training

All operational personnel shall have successfully completed a 40-hour comprehensive course with training in hazard recognition and basic health and safety issues, as required by the occupational safety and health regulations contained in 29 CFR 1910.120(e). Completion of an annual 8-hour refresher course is also required. Personnel engaged in site supervisory positions will have completed the 8-hour OSHA supervisory training as specified in 29 CFR 1910.120(e).

4.2.3 Hazards Communication Training

The principle of communicating the hazards of materials used or encountered in the work place to employees relates to all activities -- from informational programs on the completion of OE activities to adequate health and safety training. It is also important for all personnel to be aware of client concerns for adequate Hazards Communication Training due to Federal, State, and local regulations directly affecting certain activities.

4.2.4 Hearing Conservation Training

Personnel exposed to excessive noise levels will be provided training that includes the physical and psychological effects of high noise levels; noise exposure limits; and the selection, use, and limitations of hearing protection devices.

4.2.5 First Aid and CPR

A minimum of two onsite personnel will have training in First Aid and cardiopulmonary resuscitation (CPR) at each project site. The training will be equivalent to the training provided by the American Red Cross.

4.2.6 Bloodborne Pathogen Training

Personnel working on-site may be required to render assistance in providing first aid to a casualty. Training to control exposure to Bloodborne Pathogens is provided to all personnel as part of First Aid training; this training includes the employment of universal precautions.

4.3 Visitor Training

All visitors to the remedial investigation sites shall receive a health and safety briefing from the Site Safety and Health Officer. This briefing will include a description of operational activities and associated hazards. Visitors will be briefed on the boundaries of the work areas and the procedures for entrance and exit from the sites. The visitors will be advised of emergency evacuation procedures and assembly points.

Appropriate protective clothing items will be provided to the visitors prior to entry to operational areas. All hazardous OE activities will cease when visitors are present. UXO activities stop when a non-UXO qualified person is escorted or wanders into the exclusion zone. However, if the visitors are UXO qualified, UXO activities in the exclusion zone may continue. This visitor briefing will be documented with a PES form or some other means. All personnel who enter the exclusion zone during UXO operations should be essential to the conduct of the operation.

4.4 Medical Surveillance

Medical surveillance will be maintained in accordance with 29 CFR 1910.120 for employees assigned to the project site. All onsite project personnel participate in a medical monitoring program which consists of a baseline examination, annual re-examination, periodic review of exposure and health history, specific examinations when required for the duration of a project, and an exit examination upon completion of the project, if required.

4.4.1 Medical Examinations

Medical examinations consist of a baseline health assessment that includes a medical and occupational history review, blood and urine tests for contaminants of interest, electrocardiogram, slit lamp corneal examination, pulmonary function tests, chest x-ray, and a general physical examination that includes hearing and vision. Records of examination results are maintained at corporate headquarters.

Employees who terminate employment and who have worked at a hazardous waste project site may be required to undergo an exit examination equivalent to the baseline health assessment.

4.4.2 Exposure Monitoring

Exposure monitoring may be conducted during the performance of specific on-site tasks to evaluate certain hazards and determine the personal protection measures required, proper safe work practices, and the effectiveness of control measures. Monitoring will be accomplished by PES using instruments and equipment specifically designed to detect the presence and concentration of toxic vapors. Monitoring devices will be calibrated at the beginning and end of each sampling period using manufacturer's recommendations.

4.4.3 Alcohol and Drug Abuse Surveillance Plan

All employees are subject to the provisions of a corporate drug and alcohol policy. This policy requires a company to maintain a drug and alcohol-free work environment. The drug and alcohol policy shall be administered in accordance with all applicable Federal, State and local laws, and corporate guidance. All employees are prohibited from manufacturing, distributing, using, or possessing prohibited drugs or alcohol in any manner on company property, at a project site, or at any time during work hours. An amployer reserves the right to periodically test an employee or work location at its discretion. Drug testing will be conducted as required by Title 49 CFR Part 391.

5.0 HAZARD EVALUATION

5.1 Hazard Identification

PES, as the prime contractor, will maintain onsite the applicable standards. The potential hazards to personnel performing the functions outlined in this WP have been identified as explosive, chemical, industrial, and physical. An analysis of these hazards and the specific procedures to be followed to help prevent exposure is attached and shall be reviewed by all personnel prior to commencing work activities. All employees working on-site must be capable of identifying any additional hazards at the work site and notifying supervisory personnel. Supervisory personnel will determine the impact or risk of any newly-identified potential hazard. All hazards or suspected conditions that may pose hazards must be assessed to assure proper protection of operational personnel, the public, and the environment. In the event additional hazardous materials or hazardous conditions are discovered that pose an imminent threat to the safety of operational personnel, the public, and/or the environment, operations will cease until a safe course of action is determined.

Determination to proceed must consider the personal protective equipment (PPE) required for continuance of operations.

The cardinal rule to be observed in any location or operation involving explosives, ammunition, severe fire hazards, or toxic materials is to limit exposure to a minimum number of personnel, for a minimum amount of time, to the minimum amount of hazardous material consistent with safe and efficient operations. All operations shall be examined to devise methods for reducing the number of people exposed, the time of exposure, and the quantity of material handled at any given time. Determination of personnel limits requires that jobs not essential to a particular hazardous operation be performed elsewhere and that no unnecessary personnel visit the operational area.

5.1.1 Ordnance and Explosive (OE) Hazards

Projectiles, rockets, bombs, high explosives, small arms, grenades, and pyrotechnics are the types of ordnance hazards that may be found on a potential site. UXO personnel shall perform avoidance techniques while working in areas suspected of containing UXO. These techniques include clearing the inspection/investigation areas of surface metallic objects, marking and avoiding suspect UXO, locating site access routes in areas void of surface and subsurface anomalies, and relocating surface and subsurface sampling sites to areas free of anomalies which may be resultant from UXO.

5.1.1.1 Ordnance Safety Precautions

Maximum safety in any UXO operation can only be achieved through adherence to applicable safety precautions, a preplanned approach, and intensive supervision. The following precautions shall be observed:

- Only UXO qualified personnel will be involved in UXO avoidance procedures.
- UXO that has been exposed to fire and detonation must be considered extremely hazardous.
- Do not wear outer or undergarments made of wool, silk, or synthetic textiles (such as rayon and nylon) while working near UXO. These materials can generate sufficient static charge to ignite fuels or initiate explosives. Any person coming in contact with a UXO shall ground himself prior to touching EEDs in order to discharge any electrostatic charge accumulation from the body.
- Do not depress plungers, turn vanes, or rotate spindles, levers, setting rings, or other external fittings on the UXO. Such action may arm, actuate, or function the UXO.
- Do not dismantle, strip, or subject any UXO to unnecessary movement, except in response to a valid requirement.
- Assume a practice UXO contains a live charge until is can be determined otherwise.
- Do not allow unauthorized or unnecessary personnel to be present in the vicinity of UXO. Limit personnel exposure time. Operations shall always be based upon minimum exposure consistent with efficient operations.
- Avoid inhalation of, and skin contact with, smoke, fumes, and vapors associated with explosives and hazardous materials.
- Do not rely on the color coding of UXO for positive identification of contents. Munitions having no, incomplete, or improper color coding may be encountered.
- Avoid the area forward of the nose of a munition until it can be determined that the item is not a shaped-charge type item.

5.1.1.2 Chemical Warfare Material

If suspected CWM is located at any time, all work will cease immediately. Site workers will withdraw along cleared paths from the area containing the CWM. UXO personnel will clearly mark the area containing CWM and report the chemical event. UXO personnel shall standby in an upwind location until relieved by a government representative. The report of discovery of suspected CWM will be made to the Seneca Army Depot BRAC office within one hour of the discovery. The Seneca Army Depot BRAC office will then coordinate for EOD support.

If the presence of CWM is confirmed, the Government person in charge will report the chemical event to the appropriate agencies.

When reporting the suspect CWM, UXO personnel will give the following information to the senior remedial investigation representative; lack of information shall not delay the report.

- Date and local time of event
- Location
- Quantity and type of munition(s) or container(s) and chemical agents involved

- Description of what has happened
- Description of property damage
- Personnel casualties and/or injuries
- Whether medical services or facilities are required
- Assistance required
- Any other pertinent information

5.1.2 Explosives and Propellants

5.1.2.1 Properties of Initiating Explosives

Initiating explosives include lead azide, mercury fulminate, lead styphnate, and tetracene. They manifest extreme sensitivity to friction, heat, and impact. When involved in a fire, they can be expected to detonate without burning. In storage, initiating explosives shall be kept wet with water/alcohol mixtures. Place emphasis on cleanliness and general housekeeping, since contamination of these explosives with foreign, particularly gritty material markedly increases their sensitivity. Storage water must be free of bacteria-forming impurities which could react to form gases.

5.1.2.2 Properties of Booster Explosives

Explosives used for this purpose include tetryl, RDX, PETN, and RDX with added ingredients. These explosives have sensitivities between initiating explosives and those of explosives used as bursting charges, such as TNT. They may be ignited by heat, friction, or impact and may detonate when burned in large quantities or at too great a depth. Some of these materials are toxic when taken internally or by skin contact, and special PPE precautions may be necessary to protect personnel. Efforts should be utilized to minimize dust in the employee's breathing zone.

5.1.2.3 Properties of Bursting Explosives

Bursting explosives include explosive D (ammonium picrate), amatol, picric acid, TNT, tritonal, RDX compositions, HMX compositions, torpex, DBX, and HBX. In general, these materials are less sensitive than initiating or boostering explosives. Alkaline cleaning agents or other alkaline products should not be permitted in buildings where large quantities of these explosives are located.

- ***Amatol***
- ***DBX*** is an aluminized explosive that is somewhat hygroscopic and reacts with metals in the same manner as amatol.
- ***HBX*** out gasses when exposed to water.
- ***HMX*** compositions usually result in power explosives with a high degree of thermal stability.
- ***Pentolite*** tends to separate into its ingredients (PETN and TNT) and should, therefore, be handled as carefully as PETN.
- ***Picratol*** is a mixture of TNT and explosive D.
- ***Tetrytol*** is a mixture of tetryl and TNT which is stable in storage but exudes at 149°Fahrenheit.
- ***Tritonal*** is a mixture of TNT and aluminum powder and is more sensitive to impact than TNT. Tritonal must not be exposed to water.

5.1.2.4 Properties of Other Explosives

Other frequently encountered military explosives include black powder and nitroglycerin.

- ***Black powder*** deteriorates rapidly on absorption of moisture but retains its explosive properties indefinitely if kept dry.
- ***Nitroglycerin*** is extremely sensitive to impact and friction.

5.2 Biological Hazards

Biological hazards may include snakes, ticks, spiders, poison ivy/oak, and other wildlife. If applicable, PES will inform UXO personnel as to the presence of endangered/protected flora and fauna.

5.2.1 Snakes

Operational personnel should proceed with caution in areas where snakes are suspected.

5.2.1.1 Signs and Symptoms of Snakebites

A snake bite is usually characterized by extreme pain and swelling at the site of the bite; the presence of one or more puncture wounds created by the fangs; and a general skin discoloration. The manifestations of the bite include general weakness, rapid pulse, nausea and vomiting, shortness of breath, dimness of vision, tingling or numbness of the tongue, mouth or scalp, and shock.

Physical reactions from snakebite are aggravated by acute fear and anxiety. Other factors that affect the severity of local and systemic reactions include the amount of venom injected and the speed of absorption of venom into the victim's circulation; the size of the victim; protection provided by clothing, including shoes and gloves; quick anti-venom therapy; and location of the bite.

5.2.1.2 First Aid

The most important step in the first aid procedure is to get the victim to the hospital and professional medical care as quickly as possible. Meanwhile the following first aid measures should be taken:

- The victim should not move around and should remain as calm as possible. Immobilize the individual and the bitten body part in a horizontal position at or below heart level.
- Do not permit the victim to walk, run, or take alcoholic beverages or stimulants.
- If mild-to-moderate symptoms develop, a constricting band should be applied 2 to 5 inches above the bite, but not around a joint (the elbow, knee, wrist, or ankle) or around the heart, neck, or trunk. The bands should be applied just tight enough to slightly depress the skin, but not restrict blood flow. A o by 24-inch thin rubber band or 1/8-inch diameter, thin-walled gum rubber tubing is satisfactory. Swelling should be monitored and avoided and the band loosened, but not removed, if it becomes too tight.
- The pulse should be checked periodically in the extremity beyond the bite to ensure that the blood flow has not stopped.

Incision through the fang marks as an emergency measure is not advisable; this procedure is too hazardous to underlying structures and at best removes only 20% of the venom.

Suction applied to the fang bites will remove a portion of the venom and may reduce the severity of the symptoms.

Several other factors must be considered by the care giver:

- ***Shock*** - The victim should remain in a comfortable prone position and body temperature should be stabilized.
- ***Breathing and heartbeat*** - If breathing stops, mouth-to-mouth resuscitation should be administered. If breathing stops and there is no pulse, cardiopulmonary resuscitation (CPR) should be performed by a trained individual.
- ***Cleaning the bitten area*** - The bitten area may be washed with soap and water and blotted dry with sterile gauze. Dressings and bandages may be applied, but only for a short period of time.
- ***Medicine to relieve the pain*** - The victim should not be given alcohol, sedatives, or any medicine containing aspirin. Some painkillers may be given after consulting with a doctor or medical personnel for specific medications that may be used.
- ***Snakebite Kits*** - Kits should be kept accessible for all outings in primitive areas or areas known or suspected to be snake infested.

It is not recommended that cold compresses, ice, dry ice, chemical ice packs, spray refrigerants, or other methods of cold therapy be used in the first aid treatment of snakebite.

5.2.1.3 Identification Features

Non-venomous snakes are often erroneously identified as venomous. Publications have noted five sets of characteristics which may be used to separate non-venomous from venomous snakes; shape of the eye pupils, tail, head, location of the sensory pits, and scale patterns on the underside of the tail.

5.2.1.4 Prevention of Snakebite

The best snakebite treatment is to avoid getting bitten. The following suggestions will help in this process:

- Learn to identify the copperhead and rattlesnakes.
- When working in a field environment, watch where you sit, put your hands and feet.
- Avoid rock piles, stacks of old boards, and brush in wooded areas. If movement is necessary, use a remote means to initially relocate the material. Prior to entering a heavily wooded or brush area, look and listen carefully.
- Never handle "dead" snakes. They may not be completely dead.
- Do not attempt to capture or kill snakes.

5.2.2 Ticks

Lyme Disease is an illness caused by a bacterium which may be transmitted by the bite of a tick. Ticks carry Lyme Disease may be found throughout the United States living in grassy and wooded areas, and feeding on mammals such as mice, shrews, birds, raccoons, opossums, deer, and humans. Not all ticks are infected with the bacterium. When an infected tick bites, the bacterium is passed into the bloodstream of the host, where it multiplies. The various stages and symptoms of the disease are well recognized and, if detected early, can be treated with antibiotics.

Removal of ticks is best accomplished with small tweezers. Do not squeeze the tick's body. Grasp it where the mouth parts enter the skin and tug gently, but firmly, until it releases its hold on the skin. Save the tick in a jar labeled with the date, body location of the bite, and the place where it may have been acquired. Wipe the bite with antiseptic and seek medical attention as soon as possible.

The illness typically occurs in the summer months and is characterized by a slowly expanding red rash, which develops a few days to a few weeks after the bite of an infected tick. This may be accompanied by flu-like symptoms along with headache, stiff neck, fever, muscle aches, and/or general malaise. At this stage treatment by a physician is usually effective; but if left alone, these early symptoms may disappear and more serious problems may follow. The most common late symptom of the untreated disease is arthritis. Other problems which may occur include meningitis, neurological, and cardiac abnormalities. It is important to note that some people do not get the characteristic rash but progress directly to the later manifestations. Treatment of follow-on symptoms is more difficult than early symptoms and is not always successful.
Rocky Mountain Spotted Fever is another tickborne disease. Nearly all cases of infection occur in the spring and summer, generally several days after exposure to infected ticks. The onset of illness is abrupt and often accompanied by high fever, headache, chills, and severe weakness.

After the fourth day of fever, victims develop a spotted pink rash that usually starts on the hands and feet and gradually extends to most of the body. As with Lyme Disease, early detection and treatment significantly reduces the severity of illness. The disease responds to antibiotic therapy with tetracycline or chloramphenicol.

When in an area suspected of harboring ticks (grassy, bushy, or woodland areas) the following precautions can minimize the chances of being bitten by a tick:

- Wear long pants and long sleeved shirts that fit tightly at the ankles and wrists.
- Wear light colored clothing so ticks can be easily spotted.
- Tick repellents may be useful.
- Inspect clothing frequently while in tick habitat.
- Inspect head and body thoroughly when you return from the field.
- Remove any ticks by tugging with tweezers. Do not squeeze or crush the tick.

5.2.3 Spiders/Poisonous Insects

Spiders in the United States are generally harmless, with two notable exceptions; the Black Widow spider (Latrodectus Mactans) and the Brown Recluse or Violin Spider (Lox Osceles Reclusa).

The symptoms of a spider bite are:

- Slight local reaction or severe pain
- Profuse sweating
- Nausea and painful cramps in the abdominal muscles

First-aid procedures for a spider bite are as follows:

- Keep the patient calm and relaxed. Restrict activity and apply cold/ice pack to the bite.
- If the patient has an allergic reaction, care for shock.
- Transport the patient to a medical facility.

5.2.4 Poison Ivy and Poison Oak

After contacting poison ivy or poison oak, the majority of skin reactions are allergic in nature and are characterized by the general symptoms of headache, fever, itching, redness, and rash. Ordinarily, the rash begins within a few hours after exposure, but may be delayed for 24 to 48 hours.

Avoid poison ivy and poison oak plants. Their most distinctive features are their leaves, which are composed of three leaflets each. Both plants have greenish-white flowers and clustered berries.

5.2.5 Wildlife

Wildlife usually avoid people. Unhealthy or threatened wildlife may be aggressive. Potential hazards due to animal bites are best controlled by cautiously entering new areas and avoiding animals. If bitten, the victim should be immediately transported to receive proper medical attention. The condition and behavior of the animal should be noted and reported to the physician.

5.3 Exposure/Physical Hazards

5.3.1 General

Uneven terrain is a common physical hazard. Personnel shall wear the appropriate foot protection while on-site.

Dusty conditions may increase the potential of hazardous and non-hazardous particulate inhalation. Dry, windy weather and erodible surface soils could potentially expose site personnel to large quantities of air-borne particulates. Personnel may be required to wear appropriate garments and air purifying respirators if conditions warrant.

Electrical storms occur during the spring, summer, and fall. The resulting lightning poses a safety hazard to field personnel. Since the storms are often fast moving, field personnel should watch for indications of electrical storms (forecasts should be covered in the morning safety meeting). The distance to an electrical storm can be estimated by observing the interval between the lightning flash and the sound of the thunder. Since sound travels approximately 1,100 feet per second, an interval of 5 seconds corresponds to a storm distance of approximately 1 mile. If caught in the open by an electrical storm, immediately seek shelter in a vehicle and proceed to the site office for further instructions. If a vehicle is inaccessible:

Move to a topographically low area away from tall objects and conductors (trees, transformers, fences, pipelines, power lines, metal sheds) and wait for the storm to leave the area.

- If you feel your hair stand on end (an indicator that lightning is about to strike), drop to your knees and bend forward, putting your hands on your knees. Do not lie flat on the ground (be wary of seeking shelter in washes, ravines, or gullies during heavy downpours because of the risk of flash floods).

In the event of extreme weather conditions which may pose a health and/or safety risk to workers, field activities will cease until the SSHP determines conditions are safe to resume operations.

5.3.2 Sunburn

Sunburn is the least serious of the four heat disorders, but by far the most common. It can result in painful, red, swollen, or blistered skin causing the inability to continue work. Advanced cases may require medical treatment and should be viewed as a precursor to more serious heat disorders.

The first line of defense against sunburn is to cover exposed body parts such as the head, arms, and legs. Those individuals whose jobs require a great deal of exposure to the sun should take steps to gradually expose the skin to the sun for 20 minute intervals per day, extending the time as the skin builds its own natural protection in the form of a tan. If this is not possible, sun lotion, block and sun shields should be used as safeguards for overexposure.

Lotion and ointments come in various degrees of protection. Personnel with fair skin or those being exposed for the first time should use maximum protection. The level of protection should be gradually reduced as the skin tans.

Heavy sweating can reduce the protection levels of ointments and lotion. Personnel who experience heavy perspiration should reapply protection approximately every hour.

Remember that ultraviolet rays can penetrate thin layers of cloud. Sunburn protection should be worn on days that are lightly overcast.

5.3.3 Heat Stress

Heat Stress manifests itself in three disorders. From the most severe to the least severe, they are: Heat Stroke; Heat Exhaustion; and Heat Cramps.

5.3.3.1 Heat Stroke

Heat stroke (sometimes called sun stoke) is the most serious of the heat stress disorders. In its most serious form, it is lethal. It results from excessively high body temperature which in turn disturbs or interferes with the body's own heat regulating system. Normally, the body sweats, producing moisture for evaporation from the skin. During heat stroke, this perspiration - evaporation cooling process is interrupted, with a resultant quick rise in internal body temperature. Continuous exposure to high temperatures for as little as three hours can produce heat stroke. RAPID COOLING IS URGENT TO PREVENT DEATH.

The likelihood of heat stroke is lessened by protecting your body from radiant heat, breaking the work day into short work/rest periods, and drinking enough fluids to replace those lost by sweating.

5.3.3.2 Heat Exhaustion

Heat exhaustion is also known as heat prostration or heat collapse. Although heat exhaustion is considered less severe than heat stroke, failure to quickly treat heat exhaustion can lead to heat stroke.

Heat exhaustion is the result of the failure of the circulatory system to compensate for increased blood flow demands imposed by a need to cool the body and from dehydration caused by profuse sweating. If recognized and treated immediately, heat exhaustion usually results in no permanent damage.

To prevent heat exhaustion, schedule frequent rest periods. Replace lost body fluids by drinking electrolyte liquids every 15 minutes to one hour.

5.3.3.3 **Heat Cramps**

Personnel working prolonged hours where profuse sweating takes place may experience painful muscle pains and spasms known as heat cramps. Although not life-threatening, the resultant painful cramps may hinder work or cause a potential hazardous situation such as when working at heights. Heat cramps are caused by the loss of salts (electrolytes) due to sweating over a long period of time. Simple replacement of lost fluids with water without electrolyte may be insufficient to prevent heat cramps.

5.3.4 Cold Stress

If site work is to be conducted during the winter, cold stress is a concern to the health and safety of personnel.

5.3.4.1 **Chilblain**

Chilblain, produced by mild frostbite, is an inflammation caused by exposure to cold moisture. It is characterized by recurrent localized itching, swelling, and painful inflammation on the fingers, toes, or ears. Such a sequence produces severe spasm, accompanied by pain.

5.3.4.2 **Frostbite**

Localized injury resulting from cold is included in the generic term "frostbite." There are several degrees of damage. Frostbite of the extremities can be categorized as:

- Frost nip or incident frostbite - sudden blanching or whitening of the skin
- Superficial frostbite - skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient
- Deep frostbite - tissues are cold, pale, and solid; extremely serious injury

5.3.4.3 **Hypothermia**

Hypothermia (significant loss of body heat) is also a potential hazard during cold weather operations.

Signs of early hypothermia can be chills, pale skin, cold skin, muscle rigidity, depressed heart rate, and disorientation.

Hypothermia is characterized as "moderate" or "severe." A victim of moderate hypothermia may exhibit any combination of the following: severe shivering, abnormal behavior, slowing of movements, stumbling, weakness, repeated falling, inability to walk, collapse, stupor, or unconsciousness. Severe hypothermia is determined by extreme skin coldness, loss of consciousness, faint pulse, and shallow, infrequent or apparently absent respiration. Death is the ultimate result. The onset of severe shivering signals danger to personnel; exposure to cold shall be immediately terminated for any severely shivering worker. Personnel should wear insulated garments in a layered fashion to prevent hypothermia.

5.3.4.4 **Work/Rest Schedule: Cold Stress Prevention**

An appropriate work/rest regime and a heated shelter for relief from the cold will be provided, as needed. A change of clothing for each worker will be on hand. Warm non-alcoholic drinks (avoiding caffeine) and soup will be available, if required.

If work is performed continuously in conditions below 20°Fahrenheit or at an equivalent chill temperature (wind chill), the workers are encouraged to use a heated shelter at regular intervals. The frequency of breaks will depend on the environmental conditions and each individual's needs.

The onset of heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability, or euphoria are indications for immediate return to the heated shelter.

If work conditions are below 10°Fahrenheit or at an equivalent chill temperature (wind chill), the following will apply:

- Workers will work under constant supervision and the buddy system
- Work rate will be reduced to avoid heavy sweating
- Workers will be instructed in health and safety procedures. The minimum instruction will include proper warming procedures and appropriate first aid, proper clothing practices, proper eating and drinking habits, recognition of impending frostbite, and recognition of signs and symptoms of impending hyperthermia or excessive cooling of the body even when shivering does not occur.

5.4 Bloodborne Pathogenic Hazards

Bloodborne Pathogens are pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Human Immunodeficiency Virus (HIV).

Personal Protective Equipment is the first line of defense against bloodborne pathogens. The following protective equipment should be worn by personnel administering first aid if possible:

- Gloves shall be worn when hand contact with blood or other body fluids is possible or the care provider has non-intact skin areas on their hands
- Masks/Eye Protection/Face Shields will be worn when slashes, spray, or droplets of blood or body fluids are likely to occur and contaminate the eyes, nose, or mouth of care provider
- Coveralls/Jacket will be donned if the possibility exist for contamination of the body of the care giver

6.0 SITE CONTROL MEASURES

6.1 Daily Operational Procedures

The protocols to be followed during completion of the site inspections and remedial investigations shall include, but not be limited to, the following:

- The UXO Team Leader will review existing site conditions and recommend any required health and safety modifications to this WP based on the same.
- All safety and monitoring equipment will be checked for proper function.
- The UXO Team Leader in conjunction with the on-site SSO, will ensure that first aid equipment is complete and readily available.
- At the morning safety meeting, operational personnel will be briefed and updated on safety precautions, any change to the tasks and objectives of the WP, and anticipated weather conditions.

6.1.1 Morning Safety Meetings

Prior to commencing work each day, the UXO Team Leader shall conduct a Morning Safety Meeting for all personnel entering the site. At a minimum, the meeting will include the daily objectives, planned operations, potential hazards and risks associated with each day's planned activities for UXO personnel, previous confirmed encounters with hazardous materials, and any other issues relevant to the WP tasks and objectives. Meeting attendance will be documented on a Safety Meeting Attendance Log or a client-provided equivalent.

6.2 Activity Exclusion Zones

Designated exclusion zones are the primary means of maintaining site control and reducing migration of hazardous materials into uncontaminated areas during UXO operational activities. The exclusion zones will limit hazardous area access, contain hazardous materials, secure the work zone, and a buffer zone between the potentially hazardous area and the remainder of the site. Site control will be maintained at all times. Only those personnel directly involved with the task being performed will be permitted in exclusion zone.

The UXO Team will be alert to anyone entering an exclusion zone without proper authorization. Intruders will be directed to the field office. Visitors will not be permitted to enter the exclusion zone until all credentials are in order, a safety briefing has been presented, the visitor log is properly annotated, and UXO related operations have ceased.

6.3 Safe Work Practices

Personnel working with ordnance or explosives shall comply with the following general precautions while conducting operation activities:

- Operations will cease and personnel will evacuate the site when severe weather, with lighting, is within five miles of the work site.
- Cease UXO operations during sand, dust, or snow storms.
- Carrying fire or spark-producing devices is prohibited.
- Eating, drinking, chewing gum or tobacco, and smoking are prohibited.
- Fires for heating or cooking are only permitted in authorized areas.
- Do not conduct any operational activities without approved operating procedures and proper supervision.
- Do not become careless by reason of familiarity with OE related materials.
- Avoid direct physical contact with suspect chemical hazards.
- All field personnel shall use their sense (all senses) to alert team personnel of a suspected or potentially dangerous situation. If an alarm sounds or the presence of a strong nauseating odor or the visual observance of fire or smoke should occur all personnel are to evacuate the site and notify the UXO Team Leader.
- Field teams must be aware of monitoring equipment, wind direction, nearest water source, evacuation routes and emergency communication and notification procedures.
- Personnel working in the operational area will be restricted to the minimum of two. The "buddy system" will be in effect at all times.
- Unless otherwise directed, generated waste will be turned over to PES for disposal.
- A first aid-kit shall be readily available at all times.
- Operational activities will only be conducted during daylight hours.

7.0 SITE INSPECTION AND REMEDIAL INVESTIGATION PROCEDURES

7.1 General

Items encountered during operations that are positively identified as UXO will be reported to the PES Field Manager; the PES Field Manager will coordinate for the required EOD support through Seneca Army Depot. Disposition of these items is the responsibility of U.S. military EOD personnel.

UXO avoidance is the primary objective when conducting site inspections and remedial investigations. If anomalies are present at a pre-selected surface or subsurface sampling site, then a new location will be selected.

7.2 Access Clearance

UXO clearance activities shall focus on locating areas that are free of UXO for surface and near-surface and/or subsurface sampling and other site inspection and remedial investigation activities. Using a Foerster Ferex (MK26), Schonstedt GA52 or 72 series magnetometer, or equivalent, UXO personnel shall locate an access route and investigation site that are free of surface and subsurface UXO. If an anomaly is located, the access route and/or site shall be diverted around the anomaly. The boundary of each cleared site and access route shall be marked using white survey flagging or pin flags. Individual ordnance items and/or near-surface anomaly locations shall also be prominently identified with red and yellow survey flagging or pin flags, respectively. The cleared access routes shall be large enough for the sampling crews, vehicles, and equipment to safely approach the investigation site but, as a minimum, shall be a width equal to twice the width of the widest vehicle anticipated to traverse the access path.

7.2.1 Foerster Ferex Magnetometer

The Foerster Ferex Ordnance Locator, designated the MK26 Ordnance Locator, is a military-approved locator in use by U.S. Military EOD forces for detecting subsurface ordnance items. The locator is a hand-held unit that incorporates two flux-gate magnetometers, aligned and mounted a fixed distance apart to detect changes in the earth's ambient magnetic field caused by ferrous metal or disturbances caused by soil conditions.

Both an audio and metered signal are provided to the operator. The metered signal indicates whether the disturbance is geodetic or metal-related. The detection capability of the Foerster Ferex is dependent on an item's size, position, and depth. The Foerster Ferex is capable of ordnance location to the depths noted on **Table 1**.

Table 1

ITEM	**DEPTH (Meters)**	**DEPTH (Feet)**
13 mm Shell	0.28	0.92
Hand Grenade	0.71	2.33
AP Mine	1.14	3.74
AT Mine	1.50	4.92
88 mm Shell	3.00	9.80
100 mm Projectile	4.00	13.15
250 kg (550 pound) Bomb	5.00	16.40
500 kg (1,100 pound) Bomb	6.00	

19.73
Source: FEREX 4.021 User Handbook, 7/86

7.2.2 Schonstedt Magnetic Locator

Schonstedt Heliflux Magnetic Locators detect subsurface ferrous metal items. The technology is based upon fluxgate sensors organized in a gradiometer format. The Schonstedt locator is a hand-held unit that employs two (2) fluxgate magnetometers that are aligned and mounted a fixed distance apart to detect changes in the earth's ambient magnetic field caused by ferrous metal (the sensors are fixed and aligned to eliminate a response to the earth's ambient field). The Magnetic Locators respond with an audio output and a meter deflection when either one of the two sensors is exposed to a disturbance of the earth's ambient field associated with a ferrous target and/or the presence of a permanent field associated with a ferrous target (in most cases, it will be a combination of both circumstances). The Schonstedt Magnetic Locators are highly portable magnetometers that will be used to quickly screen surface and near-surface areas for ferrous content.

The Schonstedt Model GA-72CV is a reconfigured GA-52C with several design upgrades, as described below. All principles of operation and capabilities are identical. The GA-72CV:

- Has a plastic case with an attached handle grip.
- Has a meter that reads "+" and "-" ranges during operation. This meter aids in determining the orientation or horizontal and near-horizontal subsurface objects.

The Schonstedt GA-72CV is capable of ordnance location to the depths shown at **Table 2**.

Table 2

ITEM	**DEPTH (Feet)**
81 mm mortar	1
175 mm projectile	5
MK81 bomb	9

SOURCE: GA-72CV Instruction Manual, August, 1992

7.2.3 White's Eagle II Metal Detector

The Whites Eagle II Metal Detector is a man-carried, microprocessor controlled metal detector with a liquid crystal display and a keypad user interface. This metal detector operates on the induction principle -- a transmitter coil induces eddy currents within buried metal. These induced eddy currents are received by a receiver unit. The advantage of this detector is that it can detect both ferrous and non-ferrous metals.

7.2.4 Calibration

Prior to use in the field each day, geophysical instrumentation will be checked for operational reliability and calibration prior to use in the field. This daily check is the responsibility of the UXO Team Leader and will be done against a known, buried item. Copies of instrument check-out and calibration verification will be maintained on-site.

If equipment field checks indicate that a piece of equipment is operating incorrectly and field repair cannot be made, the equipment will be immediately tagged and removed from service. Replacement equipment will meet the same specifications for accuracy and sensitivity as the equipment removed from service.

7.2.5 Maintenance

Maintenance will be performed on a regularly-scheduled basis to prevent the occurrence of defects and to detect/correct minor defects. If an equipment problem is encountered, maintenance will be performed as soon as possible; records of the unscheduled maintenance and corrective action (vendor receipts) will be maintained and will indicate equipment identification, problem description, corrective action, person performing the maintenance, and associated costs.

7.3 Passive Soil Gas Sampling Canister Installation/Removal

The UXO Team will visually clear the surface of the selected soil gas sampling sites and complete subsurface clearance using a Forester Ferex (MK26), Schonstedt GA52B magnetometer, or equivalent. The UXO Team will excavate a shallow hole to a depth of approximately 18-24 inches, as required for installation of soil gas sampling canisters. A soil gas sampling canister will be installed in the hole by environmental sampling personnel; the hole will then be backfilled and marked with a pin flag or wooden stake with survey flagging for future location and recovery. At a later date, the UXO Team and the environmental sampling personnel will return to each soil gas sampling site and remove the canisters.

7.4 Surface Soil Samples

Surface soil samples are normally collected at depths from 0.0 to 1.0 foot below ground surface. The UXO Team will visually clear the surface of the selected surface soil sampling sites and complete one foot (1') subsurface clearance using a Forester Ferex (MK26), Schonstedt GA52B magnetometer, or equivalent. Environmental sampling personnel will then collect surface soil samples at the selected locations.

7.5 Subsurface Sampling

7.5.1 Hand Augering

Subsurface soil sampling at depths between 1.0 and 6.0 feet below ground surface will be accomplished using a hand auger. Hand augering will be preceded by a surface clearance and geophysical inspection to verify the presence or absence of UXO in the immediate vicinity of the hand auger location. The augered hole will be inspected with a magnetometer at increments of 2 feet below ground surface and upon reaching the final depth of six feet (providing a clearance depth of eight feet). If the proposed site is still free of magnetic anomalies, the drilling equipment may be brought on-site and utilized. Hand augering of a hole shall not proceed if an anomaly is detected that cannot be positively identified as inert material. In this event, a new location will be selected by the environmental sampling personnel.

Hand augering will also be completed in the same manner as outlined above to establish pilot holes for geoprobe active soil gas probes and shallow hollow stem soil borings. The actual sampling shall occur through a probe or boring located within a two-foot radius of the pilot hole.

7.5.2 Soil Borings and Monitoring Well Installations

Once a drilling site has been surface cleared and a hand auger pilot hole completed, as described above, the drilling contractor will be notified that the site is available for advanced soil boring or monitoring well installation. As the boring/well is advanced, the borehole shall be monitored with a magnetometer in a down-hole configuration at increments of 2 feet until the borehole is completed or the site geologist determines that virgin soil is reached. Should UXO be detected during the incremental monitoring, then an alternate drilling site shall be selected by the environmental sampling personnel. If an anomaly-free area cannot be found within five working days, drilling activities will cease.

7.5.3 Mechanical Excavation of Test Pits

7.5.3.1 General

Test pits is the technique used to identify and characterize large subsurface anomalies located during site reconnaissance (visual and electronic) and sampling of burning grounds, detonation pads, and burial sites. Prior to commencing excavation operations, every effort shall be made to identify the presence of subsurface excavation hazards (i.e., sewer, telephone, water, fuel, electric, and pipe services). Environmental sampling personnel will be responsible for identifying the location of each test pit, collecting and screening samples for analysis, and determining the actual depth and extent of excavations to be performed by the UXO Team. Each test pit excavation shall be of a top length and width necessary to safely excavate to the required depth of the test pit. No human entry into the test pit is envisioned. All UXO avoidance shall be monitored by use of a magnetometer in a down-hole configuration extending from the top of the test pit.

7.5.3.1.1 Permits

"Miss Utility" and/or excavation permits, if required, will be obtained by PES prior to the commencement of any intrusive action by the UXO Team. The UXO Team Leader is responsible to verify that all necessary excavation permits are on-site prior to commencing operations. In the event subsurface utilities are suspect in an excavation area, the UXO Team will attempt to verify their location using a magnetometer. Note that only utilities with a ferrous content are detectable with a magnetometer. All located utilities will be marked with a series of pin flags to visually display the estimated subsurface route.

7.5.3.2 Safety

Prior to opening a trench or pit, the UXO Team Leader will review the provisions of the Occupational Safety and Health Administration standards, 29 CFR 1926, to insure compliance. Excavation of trenches in which field personnel will be in danger of sliding ground or potential cave-in shall be guarded by a shoring system or sloping technique. Sloping of excavated trenches is the preferred method for exploratory trenching. All slopes shall be excavated to at least the angle of repose for the soil types encountered but shall never be less than 1:1.

Air monitoring is required at excavations where oxygen deficient or gaseous conditions are possible. Unknown hazards may exist in the subsurface layers of excavations site. Personal Protective Equipment (PPE) standards must be complied with through on-site monitoring for toxic substances. Level "D" or Modified Level "D" PPE will be required at the onset of each test pit excavation. PPE may be upgraded at certain test pits, dependent on monitoring results. The PES SSO will provide any required air monitoring and industrial site safety and determine the proper level of PPE required during excavation operations. If monitoring reveals flammable gases are present, all ignition sources will be removed and manual back-filling in the proper level of PPE will commence.

Site personnel shall be protected with PPE for the protection of head, eyes, respiratory organs, hands, feet and other parts of the body. Personnel working in the general area of mechanical equipment will wear high visibility coveralls or reflectorized body garments. Sites that will raise hazardous dust, gases, fumes, mists, or toxic atmospheres deficient in oxygen will cause personnel to don respirators.

Personnel are not to come within twenty feet of mechanical equipment until the operator has secured all moving parts and authorizes approach through positive aural communication. The equipment will be equipped with an audio backup alarm. Site personnel are not to advance to an open trench from a downwind location or from an open side. Trench frontal and rear approach for observation and investigation are authorized with respect to wind direction. Sidewall inspections with a standby safety observer may be authorized after donning of full body harness and safety line.

7.5.3.3 Specific Excavation Site Requirements

The UXO Team will visually clear the surface of the selected test pit sites and complete subsurface clearance using a Forester Ferex (MK26), Schonstedt GA52B magnetometer, or equivalent. The objective is to identify physical hazards, suspected hazards, unexploded ordnance, energetic materials, flammables, pyrotechnics, underground utilities, and unknown buried objects by position. Subsurface contacts are located and marked with a non-metallic identifier and recorded by position with registered instrument signal strength.

The test pit or trench excavation shall then proceed as follows:

- Stage equipment at the Contamination Reduction Zone (CRZ)
- Secure and inspect PPE and determine if level of personal protection is adequate
- Determine wind direction by positioning of streamers
- Place excavation equipment in an upwind direction of the proposed excavation point
- Conduct a geophysical investigation of the surface excavation area with the Ferex Ordnance Locator, or equivalent, to verify the position of any subsurface contacts
- Mark the position of any subsurface contacts and alert equipment operator of the suspected depth, approximate size, and the items orientation relative to the surface
- Equipment operator will clear all personnel from the operating radius of the excavation equipment
- Position UXO investigation team to the rear and an upwind side of excavation equipment for observation
- Perform radio communications check with safety officer
- Extend boom to the maximum length and position bucket to scrape surface with teeth extended down

WARNING

Avoid trenching directly on top of any subsurface contact. Relocate test pit if necessary.

- Scrape 4 to 6-inches of top soil from the surface
- The equipment operator will secure the equipment and the boom to the ground prior to authorizing entry of field teams to investigate the open trench
- The UXO team is to revalidate that no contacts are present and sweep the clear soil area for additional contacts that may result from movement of sub-grade material
- A UXO safety observer will visually watch the excavation process for any suspect material that may be encountered. The individual will immediately halt operations when a closer look or sampling must be conducted.
- Conduct air monitoring of exposed surface, excavated soils, and the breathing zone of investigating teams, if required
- Account for the position of all field personnel and resume the excavation procedures
- Excavation shall be performed in lifts of 6 inches
- Excavated soil will be immediately placed upwind and adjacent to the excavation in a manner that will minimize the generation of dust or airborne particulates

- Excavated fill is to be staged no higher than one half the depth of the trench and no closer than two feet from the trench
- A geophysical survey of the trench/pit excavation area will be conducted at even intervals of 2 feet depth
- Repeat investigation procedures until conclusion of sampling and investigation
- Close trench with excavated materials and tamp
- Decontaminate excavation equipment with pressure washer or steam cleaner, as directed by PES

7.5.3.4 Drums

In the event drums are encountered by the excavation team, excavation will stop and the senior remedial investigation representative will be notified immediately. The UXO Team Leader shall assist the senior remedial investigation representative in determining the material and its hazards. An assessment of the encountered drum conditions and contents will be made to determine a correct course of action. The SSO will be consulted for a determination of the necessity of an upgrade in PPE. The level of PPE will be upgraded consistent with the material present and the hazard it presents. If the hazard of the contents cannot be confirmed, maximum level PPE precautions will be taken until positive identification can be made.

If an uncovered drum is ruptured or by visual observation appears to be leaking, the area around the drum will be excavated with non-sparking tools to expose the drums identity as much as possible. Further action regarding the impacted drum and any soil which is directly affected will proceed according to the direction of the senior remedial investigation representative.

8.0 PERSONAL PROTECTION EQUIPMENT

8.1 Protecting Personnel

Protection of personnel working in a hazardous environment involves: personnel selection; training; protective clothing; hazard analysis; medical monitoring; and record keeping. The nature of the work can result in accidents or incidents, regardless of the safeguards. Injury and illness records for each location where work is being performed are maintained at corporate offices.

All operational personnel will be physically-able, medically-qualified, trained to perform the tasks assigned, and be able to wear the PPE required at the project site. Personnel using protective equipment and devices will be trained and demonstrate proficiency in its proper wear, maintenance, inspection, and testing. They must be knowledgeable of the limitations of the equipment, as well as the reduced performance levels the equipment might pose while conducting assigned tasks. The "buddy" system will be required during all activities.

Protective equipment must be maintained in a serviceable condition at all times. Defective equipment will not be used. Before being stored or reissued to another person, equipment must be cleaned, disinfected, inspected, and repaired (if necessary).

Employee-provided equipment must meet or exceed the standards PES is required to meet at the job site.

8.2 Selection Criteria

The purpose of PPE is to reduce contaminant levels below Permissible Exposure Levels (PEL). The goal, however, is no exposure.

If operations proceed as planned, the concentration of contaminants will always be less than PEL. The protective equipment is necessary, however, should there be a leak or system failure. As a conservative measure, PPE shall be worn at any time there is a potential for exposure.

The following factors will be evaluated in selecting an appropriate PPE level:

- Routes of Potential Exposure
- Inhalation
- Skin absorption
- Ingestion
- Eye and skin contact
- Performance of PPE materials
- Task specific conditions
- Durability of PPE

Criteria for the various levels are as follows:

Level A - Required when the greatest level of skin, respiratory, and eye protection are necessary. Types of hazards include: (1) where an identified hazardous substance requires the highest level of protection for skin, eyes, and respiratory system based on high concentrations of atmospheric vapors, gases, or particulates, or the work involves a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials which are harmful to skin or capable of absorbency through the skin (2) substances with a high degree of skin hazard are present and skin contact is possible (3) operations conducted in confined or poorly ventilated areas with unknown conditions.

Level B - Appropriate when the highest level of respiratory protection is required but a lesser level of skin protection is needed. Types of hazards where Level B can be used include: (1) types and concentrations of substances have been determined that require a high level of respiratory protection, but not skin protection (2) the atmosphere contains less than 19.5% oxygen (3) where incompletely identified vapors or gases are indicated by air monitoring but are not suspected of containing high levels of chemicals harmful to skin or capable of absorbency through the skin.

Level C - Used when the concentrations and types of airborne substances are known and the criteria for air-purifying respirators are met (i.e., where the contaminants are known, an appropriate filter is available, concentrations are within acceptable limits [not IDLH], and the contaminant has good warning properties). Level C can be used when (1) the atmospheric contaminants, liquid splash, or other direct contact will not adversely affect or be absorbed through exposed skin (2) the types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is capable of removing contaminants (3) all criteria for use of a respirator are met.

Level D - When only a minimal level of protection is necessary (i.e., for nuisance levels of contaminants). This low level of protection may be appropriate when: (1) there are no atmospheric hazards (2) the work will not involve splashes, immersion, inhalation, or contact with hazardous levels of any chemical.

8.3 Training and Fitting

The human respiratory system is the easiest and most vulnerable entry in the body for airborne contaminants. To minimize the chances for any gases or vapors to enter the lungs, a respiratory protection program will be established for use at the site.

Respiratory training for the safety training program will educate site personnel in the proper use of the respiratory equipment selected for this job and the different protection levels afforded by this equipment as it relates to compressed gases. Instruction will also be supplied to workers in the proper maintenance and care of the respiratory equipment.

8.4 Level A and B

8.4.1 Use and Limitations

At Level A and B sites, at least one of the backup personnel will be outfitted in same level PPE with supplied air connections and SCBA. This person will be available for immediate response to emergencies.

Supplied air equipment associated with Levels A and B PPE offers limited protection against high concentrations of gases. The protection factor is generally rated at 10,000. For this reason, the ensemble cannot be used in atmospheres with concentrations above 10,000 times the permissible exposure limit.

Use of chemical protective suits may be limited by temperature stress, particularly heat stress. The impermeable suit traps heat and does not allow sweat to evaporate and cool the body.

8.4.2 Maintenance and Storage

Level A and B suits should be stored upright on a hanger. The boots should be stored upright, if possible. The suit should be cleaned prior to storage; it should not be dried in direct sunlight. Respirators must be stored in a clean, dry, and cool location. They should be stored in protective plastic bags.

8.4.3 Donning and Doffing Procedures

<u>EQUIPMENT INSPECTION</u>

- Team dressed in normal work clothing
- Personal items removed (wallets, watches, jewelry, etc.)
- Suit Inspection:
- Zipper(s) (Works Properly)
- Seams (Intact)
- Gloves (Condition)
- Boots (Condition)
- Fabric (Holes, Tears, Abrasions, etc.)
- Supplied Air Inspection:
- Air supply checked and validated (In Date)
- Escape Pack Bottle Pressure (full)
- High Pressure Hose(s) (Leaks, Frail, etc.)
- Harness and Straps (Extended, Good Condition)
- Valves (Function)
- Low Air Alarm (Functions at Correct Pressure)
- Face Piece (Clean, Elasticity, etc.)
- Communications:
- Radio (Proper Frequency, Test, etc.)
- Backup Signals Established (Hand, Audible, etc.)

<u>DONNING PROCEDURES (LEVEL A & B)</u>

- Put on chemical resistant coveralls (up to waist)
- Put on outer boots
- Put pant leg of coverall over boot (outside)
- Tape leg of coverall to boots (pull up slack)
- Put on face piece
- Test face piece (negative test)
- Put on inner gloves
- Put arms into sleeves of coveralls (inner glove goes under coverall sleeves)
- Put on outer gloves (over sleeves)
- Tape outer gloves to sleeves (buddy tab)
- Zip coveralls closed and secure protective flap over zipper
- Put hood over head (if present, snug draw string)

- Tape hood mask (buddy tabs)
- Secure and snug air supply harness
- Turn on air at manifold valve
- Now is the time for final brief.
- **This is also the step Backup Team will be dressed to**
- Attach breathing tube to regulator and open the mainline valve
- Put mode selector lever in positive pressure position (if present)

The Trellchem suit, if utilized, should be donned in accordance with the manufacturer's instructions.

Prior to removal of PPE, decontamination procedure must be completed. The equipment should be removed in the following order:

- Outer gloves
- Respirator and escape pack
- Suit
- Inner gloves

8.5 Inspection

All PPE must be inspected before and after every use. It should be generally evaluated for wear, rips, tears, or other damage. Any visible dirt or other contaminants should be removed.

8.6 Eye and Face Protection

Eye protection that meets the requirements of American National Standards Institute (ANSI) standard Z87.1 will be used on the job site. Contact lenses may not be worn during operational activities at any time. Personnel requiring contact lenses will wear goggles over prescription eyeglasses or goggles fitted with prescription lenses behind the protective lenses.

8.7 Hearing Protection

The SSO (or UXO Team Leader, if the SSO is not onsite) will monitor high noise levels when equipment or machinery is being used on-site. Those working in areas where noise levels can be expected to reach or exceed 85 dBA, 8 hr. TWA will be issued hearing protection to reduce the level below the threshold.

8.8 Head Protection

All personnel working in or visiting a hard hat area will be issued and required to wear protective headgear meeting the ANSI Z89.1 standards. Hard hats will not be required during the site inspection and remedial investigations unless a head injury is possible from overhead hazards.

Headgear and components will be visually inspected daily for signs of cracks, dents, or other defects that may reduce the effectiveness of the equipment.

8.9 Fire Extinguishers

A dry-chemical type 4A:20B:C portable fire extinguisher approved by a nationally- recognized testing laboratory, and labeled to identify the labeling organization and the fire test and performance standard, will be provided. Extinguishers will be in a fully-charged and operable condition at all times.

Each vehicle on-site, the operational field office, and each work site will be supplied with at least one 2A:10B:C fire extinguisher.

8.10 First Aid Equipment and Supplies

First aid kits, complying with 29 CFR 1910.151, will be located at each operational area and at the operational field office. The number of kits will be sufficient to accommodate the maximum number of people on-site at any given time. The SSO will maintain one kit in their possession at all times. Kits will be inspected on a weekly basis and missing components replaced immediately.

8.11 Emergency Eye-Wash

An emergency eye-wash station shall be maintained at each site by PES.

8.12 Personal Hygiene

Personnel will be briefed on the importance of maintaining good personal hygiene while working on-site. An adequate water and soap supply will be provided to allow personnel to wash hands and face prior to leaving the site. Personnel will be reminded to wash prior to eating or drinking after working on-site.

9.0 DECONTAMINATION

9.1 Personnel Decontamination

Based on available site hazard characterization, personnel decontamination during normal site conditions will consist of ensuring boots, gloves, and outer garments are examined and not permitted to transfer mud and dirt off-site during operational activities. If required, a mini wash station will be set up on the tailgate of a work truck. The decontamination station shall consist of distilled water, soap or detergent, plastic bucket, scrub brushes and long-handle brushes, paper towels, and plastic garbage bags. Personnel will wash hands and face prior to departing the site. At no time shall contaminated or potentially contaminated personnel, clothing, or equipment be placed or transported in personal vehicles.

PPE, including but not limited to disposable gloves and boots, coveralls, and spent respirator cartridges, will be temporarily stored in properly labeled drums or pails at each investigation site. Following site activities, PPE will be consolidated and deposited in labeled drums at central storage locations as designated by the senior on-site remedial investigation representative. UXO personnel are not responsible for disposal of site-generated hazardous waste. UXO personnel shall make a good faith effort to minimize hazardous waste generation.

9.2 Equipment Decontamination

All support vehicles will be parked outside the exclusion zone, thereby eliminating the need for decontamination.
All sampling equipment must be decontaminated prior to leaving each remedial investigation site. The equipment will be steam cleaned on-site with decontamination water drained into the most recently completed sampling location. All sampling equipment will be subject to a detailed steam cleaning prior to removal from the site. This will be performed in an area to be designated by the senior on-site remedial investigation representative.

9.3 Levels A and B Decontamination Protocol

<u>Personnel Decon</u>: (located within the Contamination Reduction Corridor (CRC))
Station - 1 Equipment drop - See equipment decon below.
Station - 2 Suit, rubber boots, and outer gloves wash - suit, boots, and gloves are scrubbed down with a dishwashing detergent solution in separate portable tubs.
Station - 3 Suit, rubber boots, and outer gloves rinse - suit, boots, and gloves are rinsed off in separate primary, then secondary, rinse tubs.
Station - 4 Supplied air equipment removal and staging in Station 4.2.
Station - 4.1 Suits , rubber boots, and outer gloves removal - suit and boots are stored and gloves are discarded in a drum.
Station - 4.2 Respirator cleaning - All respirators will be hand washed/rinsed in provided tubs only for respirators. After cleaning, masks will be disinfected and stored safely.

Station - 5 Inner gloves removal and disposal.
Station - 6 Personnel clothing change, if appropriate.

Equipment Decon: (hand tools)
Station - 1 Equipment drop - Tools and equipment will remain in the work area unless they require service, repair, or need to be transported out of the Exclusion Zone (Section 6.2).
Station - 1.1 Equipment wash - Equipment will be washed down portable tubs separate from the personnel decon tubs.
Station - 1.2 Equipment rinse - Equipment will be double rinsed in a portable tub separate from the personnel decon tubs.
Station - 1.3 Equipment tagged - All equipment deconned thoroughly and tagged to identify it as clean and safe for removal from the CRC to the Support Zone.

10.0 EMERGENCY PROCEDURES

10.1 Accidents

The nature of the work can result in accidents or incidents, regardless of the safeguards. Injury and illness records for each location where work is being performed are maintained at corporate offices.

10.2 Emergency Response

Situations requiring emergency response can be minimized by planning and approaching the circumstances in a calm, deliberate manner. Immediate control of the situation will reduce the potential for placing on-site personnel and the surrounding community in jeopardy.

10.2.1 On-site Emergency Assistance

In the event of an on-site emergency, the SSO will direct the course of action. It may be necessary for the SSO to depend on other on-site personnel for assistance. A first-aid kit, eyewash, approved fire extinguisher, and drinking water will be readily available in the support zone of each operational area.

10.2.2 Emergency Rescue

If an emergency response rescue operation is required, no one will re-enter the accident area until the hazards of the situation have been assessed and all required resources are on-hand to complete the rescue without jeopardizing the safety of rescue personnel.

An Emergency Response Rescue operation shall include the following elements:

- An emergency response vehicle(s) will be designated and remain on-site during rescue operations.
- Enforcement of the Buddy System is required. No one will be permitted to enter a rescue area alone.
- Locate all victims, assess their conditions, and determine the resources needed for stabilization and transport.
- Assess the situation and determine the existing hazards, the potential for additional hazards, and the need for additional emergency support.
- Request emergency response by outside agencies, if required.
- Determine the need to alert the local community if off-site personnel or property are in jeopardy.
- Remove injured personnel from the area. Decontamination, if required, will be accomplished prior to personnel leaving the area. Decontamination of injured parties will be accomplished after stabilization of their medical conditions. This action need not be accomplished if their condition poses immediate threat to the victim's life or may cause additional injury. If contamination is suspected, the victim will be wrapped in material to prevent the spread of contamination during extrication and transport.

10.2.3 Off-Site Response

In the event off-site emergency response is required, emergency telephone numbers to be used to call for assistance are listed on **Table 3**.

AGENCY	**TELEPHONE NUMBER**
Ambulance	607-869-1436
Fire Department	607-869-1316
Police Department	607-869-1448
Geneva General Hospital	315-798-4222
Seneca Army Depot Activity Duty Officer	607-869-0251
725th Ordnance Company (EOD), Fort Drum, NY	315-772-5408
Poison Control Information	1-800-642-9999
Hazardous Materials Emergency	1-800-424-8802
US Army Corps of Engineers - Huntsville - OE Safety	(205) 895-1579

10.2.4 Accident and Evacuation Warning

A warning system utilizing a series of three (3) short blasts on portable air horns and/or vehicle horns will notify site personnel that an accident or incident has occurred and evacuation is required. Upon hearing the evacuation warning, all personnel will immediately exit the work site and report to the designated emergency assembly area (EAA), as designated by the SSO. At the EAA, personnel accountability will be noted and personnel will be interviewed to assure no one has sustained injuries as a result of the accident or incident.

11.0 DOCUMENTATION

11.1 Required Documentation and Responsible Party

The UXO Team Leader is responsible for adherence to this WP. No addenda or revisions to this task specific WP will be made unless approved by the client.

The implementation of this WP must be documented to assure employee participation and protection. In addition, the regulatory requirements must be met for record keeping of training, medical surveillance, injuries and illnesses, exposure monitoring data, health risk information, and respirator fit tests.

The UXO Team Leader will conduct a UXO related site safety briefing prior to commencing operational activities each work day. Documentation of this site safety briefing will be accomplished by completing an Safety Meeting Attendance Log, or equivalent, daily. In addition, the UXO Team Leader is responsible for maintaining safety records on all health and safety issues and assuring that all accident and incident reports are completed and submitted in a timely manner.

The UXO Team Leader will keep a Daily Activity Log Book, which is the official record of operational activities completed and will contain, as a minimum, the following information:

- Date and start and stop times
- Daily weather conditions
-

- Proposed and actual work activities
- Equipment use (type and length of time)
- Injuries, incidents, or any other health and safety-related issues or situations, including as many facts concerning the accident/incident as possible
- Official communications, written and verbal
- Any other issues relevant to the project

11.1.1 Accident Reporting

Employees are responsible for reporting all injuries (cuts, fractures, sprains, or amputations) as soon as possible to the UXO Team Leader, who will immediately notify corporate officials and the on-site SSO. Reporting will be accomplished by completing an Employee Injury/Property Damage Report Form and forwarding the report to the corporate office as well as to the client within two working days of the reportable injury. Any witnesses to an accident or incident shall complete a Witness Statement Form. The UXO will also perform any other reporting requirements as directed by PES and as required by Seneca Army Depot and the state of New York.

All incidents resulting in one or more of the following shall be reported and investigated:

- One or more fatalities (must be recorded regardless of the length of time between the injury and death)
- One or more lost workdays
- Restriction of work or motion
- Loss of consciousness
- Medical treatment required (other than first aid)

11.1.1.1 Responsibility for Accident Investigation

All accidents associated with the project, on or off-site will be investigated and analyzed. Information reflected on the report forms will be the basis to investigate the accident and analyze the cause and identify what corrective action may be implemented to prevent similar occurrences.

The UXO Team Leader will use an Unexploded Ordnance Receipt when transferring UXO through PES to military EOD personnel.

11.1.2 Exposure Data

Employees are responsible for reporting all occupational illnesses and/or abnormal conditions or disorders caused by exposure to environmental factors associated with the work site. These conditions must be reported to their immediate supervisor, regardless of severity, as soon as possible after their discovery. Medical treatment will be provided to determine the cause and nature of the illness and proper treatment.

Appendix G
TCLP Lead vs. Total Lead Data

PARSONS ENGINEERING SCIENCE, INC. • 30 DAN ROAD • CANTON, MA 02021-2809

FACSIMILE COVER SHEET

To: Kevin Healy
Company: U.S. Army Engineering Support Center
Phone: (205) 895-1627
Fax: (205) 895-1602

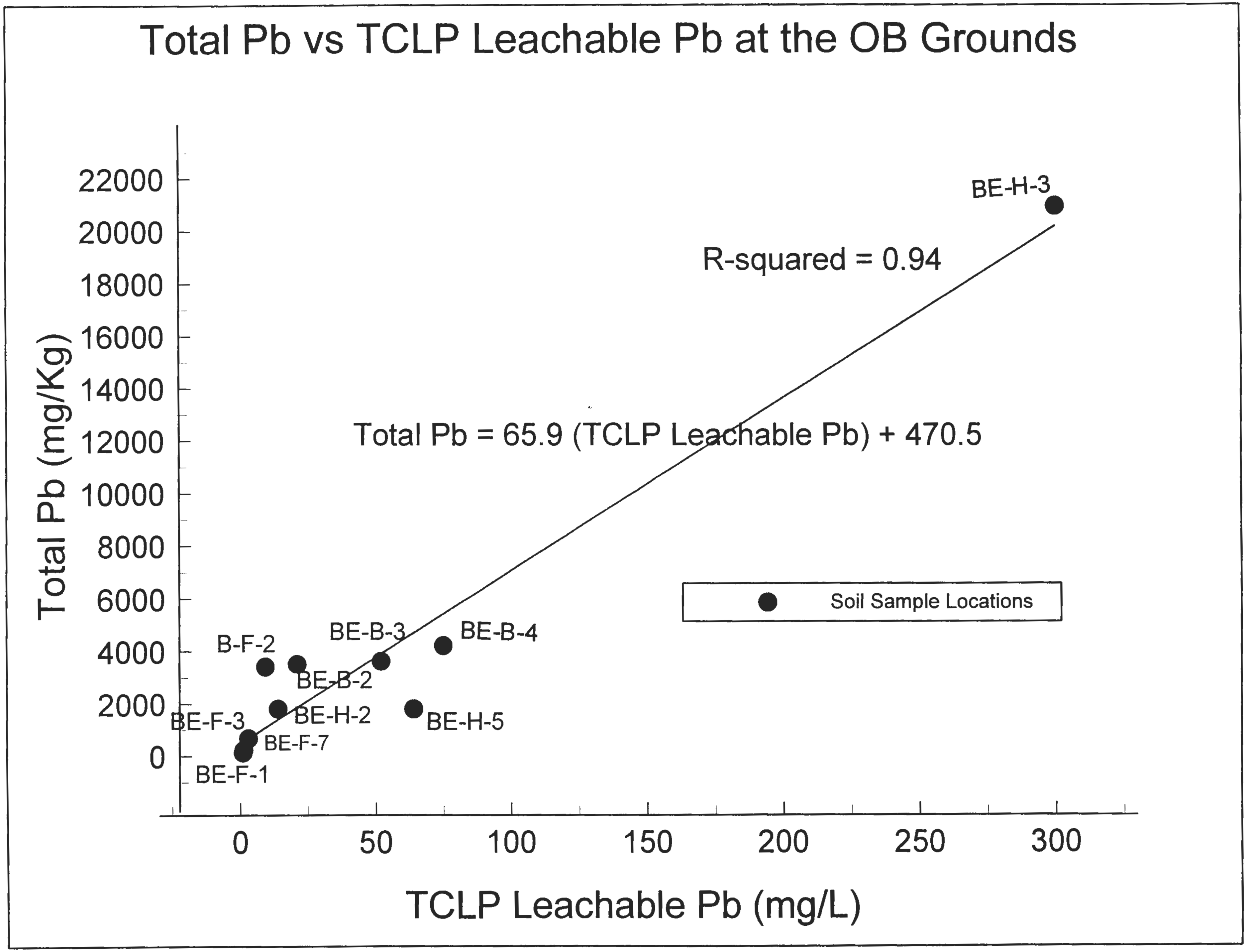
From: Michael Duchesneau
Company: Parsons Engineering Science
Phone: (781) 401-2492
Fax: (781) 401-2043
Job No.: 20892

Date: June 4, 1998
Pages including this cover page: 2

Comments: **Kevin ,**

Attached is the plot of the ten samples that we collected for total metals and TCLP metals at the OB Grounds. The locations were from pads, Pad B, Pad F and Pad H. The correlation coefficient, 0.94, indicates that there is a good relationship. The regression equation, shown on the graph, indicates that at 5 mg/L, the cutoff for TCLP leachability for Pb, the total Pb concentration will be 800 mg/Kg. This is much less than we thought when we did the initial estimates. For this we used 5000 mg/Kg.

Call with any comments or questions.
Regards
Mike D.



Total Pb vs TCLP Leachable Pb at the OB Grounds
Total Pb (mg/Kg)
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
0
50
100
150
200
250
300
TCLP Leachable Pb (mg/L)
BE-H-3
R-squared = 0.94
Total Pb = 65.9 (TCLP Leachable Pb) + 470.5
Soil Sample Locations
B-F-2
BE-B-3
BE-B-4
BE-B-2
BE-H-2
BE-H-5
BE-F-3
BE-F-7
BE-F-1

LSL

QUICK RESPONSE FAX OF LABORATORY RESULTS

4-17-98
Today's Date

TO: Mark Paprocki

COMPANY: Seneca Army Depot

FAX PHONE NUMBER: (607) 869-1362

FROM: LSL QUALITY DEPARTMENT
LIFE SCIENCE LABORATORIES, INC.

LSL PROJECT NUMBER: 9801778

NUMBER OF PAGES TRANSMITTED: 12
(including cover page)

COMMENTS:

Thank you for the opportunity to be of service to you. We appreciate your business. If you need further assistance, please don't hesitate to contact LSL.

Need Help With ...	Ask for ...
Questions About Your Results	Quality Department
Price Quotation	Client Services Department
Request for Sample Kits or Scheduling Pickup of Samples	Field Services Department
Status of Samples Being Analyzed	Technical Services Department

If you do not receive all of the pages, please contact us immediately at (315) 445-1105.

LIFE SCIENCE LABORATORIES, INC.
5854 Butternut Drive, E. Syracuse, NY 13057

LSL

Laboratory Analysis Report

LSL Project Number: 9801778

Karen Balkwerer QDO

Reviewed By

4/16/98

-- LABORATORY ANALYSIS REPORT --

Seneca Army Depot Activity
5786 State Route 96, Attn:Contracting Bldg 123
Romulus, NY 14541-5001

Attn: Mark Paprocki
Phone: (607) 869-1317
FAX: (607) 869-1362

Sample ID: BE-B-3
Project No.:
Source: Demo Grounds
LSL Sample ID: 9801778-001
Sample Matrix: SHW

Authorization:
LSL Project No.: 9801778
Date Sampled: 4/1/98
Report Date: 4/17/98

Analytical Method Parameter(s)	Results	Units	Analysis Date	Comment
EPA 1311 TCLP Extraction				
TCLP Non-Volatile Extraction			4/9/98	
EPA 245.1 TCLP Mercury				
Mercury	<0.002	mg/l	4/14/98	
EPA 6010 RCRA Metals				
Barium	2400	mg/kg	4/15/98	
Cadmium	9.7	mg/kg	4/15/98	
Chromium	24	mg/kg	4/15/98	
Lead	3600	mg/kg	4/15/98	
EPA 6010 TCLP Metals				
Barium	12	mg/l	4/15/98	
Cadmium	<0.5	mg/l	4/15/98	
Chromium	<1	mg/l	4/15/98	
Lead	52	mg/l	4/15/98	
EPA 7471 Mercury				
Mercury	0.13	mg/kg	4/14/98	

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Romulus, NY 14541-5001

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Sample ID: BE-B-4
Project No.:
Source: Demo Grounds
LSL Sample ID: 9801778-002
Sample Matrix: SHW

Authorization:
LSL Project No.: 9801778
Date Sampled: 4/1/98
Report Date: 4/17/98

Analytical Method Parameter(s)	Results	Units	Analysis Date	Comment
EPA 1311 TCLP Extraction				
TCLP Non-Volatile Extraction			4/9/98	
EPA 245.1 TCLP Mercury				
Mercury	<0.002	mg/l	4/14/98	
EPA 6010 RCRA Metals				
Barium	1800	mg/kg	4/15/98	
Cadmium	3.4	mg/kg	4/15/98	
Chromium	23	mg/kg	4/15/98	
Lead	4200	mg/kg	4/15/98	
EPA 6010 TCLP Metals				
Barium	19	mg/l	4/15/98	
Cadmium	<0.5	mg/l	4/15/98	
Chromium	<1	mg/l	4/15/98	
Lead	75	mg/l	4/15/98	
EPA 7471 Mercury				
Mercury	<0.1	mg/kg	4/14/98	

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5786 State Route 96, Attn:Contracting Bldg 123
Romulus, NY 14541-5001

Attn: Mark Paprocki
Phone: (607) 869-1317
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Sample ID: BE-B-2
Project No.:
Source: Demo Grounds
LSL Sample ID: 9801778-003
Sample Matrix: SHW

Authorization:
LSL Project No.: 9801778
Date Sampled: 4/1/98
Report Date: 4/17/98

Analytical Method / Parameter(s)	Results	Units	Analysis Date	Comment
EPA 1311 TCLP Extraction				
TCLP Non-Volatile Extraction			4/9/98	
EPA 245.1 TCLP Mercury				
Mercury	<0.002	mg/l	4/14/98	
EPA 6010 RCRA Metals				
Barium	900	mg/kg	4/15/98	
Cadmium	1.7	mg/kg	4/15/98	
Chromium	19	mg/kg	4/15/98	
Lead	3400	mg/kg	4/15/98	
EPA 6010 TCLP Metals				
Barium	6.3	mg/l	4/15/98	
Cadmium	<0.5	mg/l	4/15/98	
Chromium	<1	mg/l	4/15/98	
Lead	9.2	mg/l	4/15/98	
EPA 7471 Mercury				
Mercury	0.13	mg/kg	4/14/98	

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Phone: (607) 869-1317
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Sample ID: BE-F-7
Project No.:
Source: Demo Grounds
LSL Sample ID: 9801778-004
Sample Matrix: SHW

Authorization:
LSL Project No.: 9801778
Date Sampled: 4/1/98
Report Date: 4/17/98

Analytical Method Parameter(s)	Results	Units	Analysis Date	Comment
EPA 1311 TCLP Extraction				
TCLP Non-Volatile Extraction			4/9/98	
EPA 245.1 TCLP Mercury				
Mercury	<0.002	mg/l	4/14/98	
EPA 6010 RCRA Metals				
Barium	290	mg/kg	4/15/98	
Cadmium	12	mg/kg	4/15/98	
Chromium	19	mg/kg	4/15/98	
Lead	660	mg/kg	4/15/98	
EPA 6010 TCLP Metals				
Barium	<5	mg/l	4/15/98	
Cadmium	<0.5	mg/l	4/15/98	
Chromium	<1	mg/l	4/15/98	
Lead	3.0	mg/l	4/15/98	
EPA 7471 Mercury				
Mercury	0.15	mg/kg	4/14/98	

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NYS DOH ELAP No. 10248

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Phone: (607) 869-1317
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Sample ID: BE-F-3
Project No.:
Source: Demo Grounds
LSL Sample ID: 9801778-005
Sample Matrix: SHW

Authorization:
LSL Project No.: 9801778
Date Sampled: 4/1/98
Report Date: 4/17/98

Analytical Method / Parameter(s)	Results	Units	Analysis Date	Comment
EPA 1311 TCLP Extraction				
TCLP Non-Volatile Extraction			4/9/98	
EPA 245.1 TCLP Mercury				
Mercury	<0.002	mg/l	4/14/98	
EPA 6010 RCRA Metals				
Barium	200	mg/kg	4/15/98	
Cadmium	<1	mg/kg	4/15/98	
Chromium	15	mg/kg	4/15/98	
Lead	220	mg/kg	4/15/98	
EPA 6010 TCLP Metals				
Barium	<5	mg/l	4/15/98	
Cadmium	<0.5	mg/l	4/15/98	
Chromium	<1	mg/l	4/15/98	
Lead	1.3	mg/l	4/15/98	
EPA 7471 Mercury				
Mercury	0.29	mg/kg	4/14/98	

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Sample ID: B-F-2
Project No.:
Source: Demo Grounds
LSL Sample ID: 9801778-006
Sample Matrix: SHW

Authorization:
LSL Project No.: 9801778
Date Sampled: 4/1/98
Report Date: 4/17/98

Analytical Method Parameter(s)	Results	Units	Analysis Date	Comment
EPA 1311 TCLP Extraction				
TCLP Non-Volatile Extraction			4/9/98	
EPA 245.1 TCLP Mercury				
Mercury	<0.002	mg/l	4/14/98	
EPA 6010 RCRA Metals				
Barium	710	mg/kg	4/15/98	
Cadmium	2.0	mg/kg	4/15/98	
Chromium	23	mg/kg	4/15/98	
Lead	3500	mg/kg	4/15/98	
EPA 6010 TCLP Metals				
Barium	<5	mg/l	4/15/98	
Cadmium	<0.5	mg/l	4/15/98	
Chromium	<1	mg/l	4/15/98	
Lead	21	mg/l	4/15/98	
EPA 7471 Mercury				
Mercury	0.12	mg/kg	4/14/98	

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Attn: Mark Paprocki
Phone: (607) 869-1317
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Sample ID: BE-F-1

Project No.:
Source: Demo Grounds
LSL Sample ID: 9801778-007
Sample Matrix: SHW

Authorization:
LSL Project No.: 9801778
Date Sampled: 4/1/98
Report Date: 4/17/98

Analytical Method / Parameter(s)	Results	Units	Analysis Date	Comment
EPA 1311 TCLP Extraction				
TCLP Non-Volatile Extraction			4/9/98	
EPA 245.1 TCLP Mercury				
Mercury	<0.002	mg/l	4/14/98	
EPA 6010 RCRA Metals				
Barium	200	mg/kg	4/15/98	
Cadmium	1.1	mg/kg	4/15/98	
Chromium	16	mg/kg	4/15/98	
Lead	130	mg/kg	4/15/98	
EPA 6010 TCLP Metals				
Barium	<5	mg/l	4/15/98	
Cadmium	<0.5	mg/l	4/15/98	
Chromium	<1	mg/l	4/15/98	
Lead	<1	mg/l	4/15/98	
EPA 7471 Mercury				
Mercury	0.22	mg/kg	4/14/98	

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Sample ID: BE-H-3
Project No.:
Source: Demo Grounds
LSL Sample ID: 9801778-008
Sample Matrix: SHW

Authorization:
LSL Project No.: 9801778
Date Sampled: 4/1/98
Report Date: 4/17/98

Analytical Method Parameter(s)	Results	Units	Analysis Date	Comment
EPA 1311 TCLP Extraction				
TCLP Non-Volatile Extraction			4/9/98	
EPA 245.1 TCLP Mercury				
Mercury	<0.002	mg/l	4/14/98	
EPA 6010 RCRA Metals				
Barium	6400	mg/kg	4/15/98	
Cadmium	3.2	mg/kg	4/15/98	
Chromium	31	mg/kg	4/15/98	
Lead	21000	mg/kg	4/15/98	
EPA 6010 TCLP Metals				
Barium	86	mg/l	4/15/98	
Cadmium	<0.5	mg/l	4/15/98	
Chromium	<1	mg/l	4/15/98	
Lead	300	mg/l	4/15/98	
EPA 7471 Mercury				
Mercury	0.23	mg/kg	4/14/98	

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Sample ID: BE-H-2
Project No.:
Source: Demo Grounds
LSL Sample ID: 9801778-009
Sample Matrix: SHW

Authorization:
LSL Project No.: 9801778
Date Sampled: 4/1/98
Report Date: 4/17/98

Analytical Method Parameter(s)	Results	Units	Analysis Date	Comment
EPA 1311 TCLP Extraction				
TCLP Non-Volatile Extraction			4/9/98	
EPA 245.1 TCLP Mercury				
Mercury	<0.002	mg/l	4/14/98	
EPA 6010 RCRA Metals				
Barium	570	mg/kg	4/15/98	
Cadmium	1.5	mg/kg	4/15/98	
Chromium	22	mg/kg	4/15/98	
Lead	1800	mg/kg	4/15/98	
EPA 6010 TCLP Metals				
Barium	<5	mg/l	4/15/98	
Cadmium	<0.5	mg/l	4/15/98	
Chromium	<1	mg/l	4/15/98	
Lead	14	mg/l	4/15/98	
EPA 7471 Mercury				
Mercury	0.51	mg/kg	4/14/98	

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Sample ID: BE-H-5
Project No.:
Source: Demo Grounds
LSL Sample ID: 9801778-010
Sample Matrix: SHW

Authorization:
LSL Project No.: 9801778
Date Sampled: 4/1/98
Report Date: 4/17/98

Analytical Method Parameter(s)	Results	Units	Analysis Date	Comment
EPA 1311 TCLP Extraction				
TCLP Non-Volatile Extraction	0		4/9/98	
EPA 245.1 TCLP Mercury				
Mercury	<0.002	mg/l	4/14/98	
EPA 6010 RCRA Metals				
Barium	1300	mg/kg	4/15/98	
Cadmium	1.4	mg/kg	4/15/98	
Chromium	20	mg/kg	4/15/98	
Lead	1800	mg/kg	4/15/98	
EPA 6010 TCLP Metals				
Barium	7.8	mg/l	4/15/98	
Cadmium	<0.5	mg/l	4/15/98	
Chromium	<1	mg/l	4/15/98	
Lead	64	mg/l	4/15/98	
EPA 7471 Mercury				
Mercury	0.20	mg/kg	4/14/98	

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Appendix H
Monitoring Well Installation Specification

WELL INSTALLATION PROCEDURES

taken from

APPENDIX A

FIELD SAMPLING AND ANALYSIS PLAN

GENERIC INSTALLATION RI/FS WORK PLAN

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

The following information is taken from sections of the Generic Installation RI/FS Work Plan, which have been renumbered here. These sections are to be used for the installation of wells at Seneca Army Depot Activity. The sections are as follows:

1. Soil Borings
2. Monitoring Well Installation
3. Monitoring Well Development
4. Surveying
5. Investigation-Generated Derived Waste
6. Equipment and Material Decontamination
7. Record keeping

1 SOIL BORINGS

1.1 Objectives

The objectives of the soil borings are to collect soil samples and provide a mechanism to install permanent groundwater monitoring points.

1.2 Boring Techniques

Hollow stem augers (4.25 or 6.25 inch I.D.) will be used to drill each boring. The borings will be advanced to "refusal" which will represent the depth of the "competent" bedrock. Penetration through the till and upper few feet of the weathered shale can be easily documented by split spoon sampling and the augering rate. However, the determination at auger "refusal" in competent shale will be somewhat subjective as the hollow stem augers can generally penetrate through the shale, although at a very slow rate. For the purposes of these studies, auger "refusal" in "competent" shale will be defined as the depth (after penetrating the weathered shale) when augering becomes significantly more difficult and auger advancement is slow.

Soil samples will be collected continuously during the boring using a standard two- or three-inch diameter, two-foot long carbon steel split spoon barrel. Soil samples will be screened for volatile organic compounds using a PID or OVM.

All borings will be logged using a standardized boring log form (Figure A-2). Soil samples will be classified according to the Unified Soil Classification System (USCS). In addition, a lithologic description will be provided according to the Burmiester system. Each boring log will record:

1. Boring identification and location;
2. Type of and manufacturer's name of drilling equipment;
3. Type and size of sampling and drilling equipment;
4. Starting and ending dates of drilling;
5. Length and depth of each sampled interval;
6. Length of each recovered sample;
7. Depth of all stratigraphic changes;
8. Lithologic description according to the Burmiester system and soil classification using standard USCS nomenclature;
9. Depth at which groundwater is first encountered;
10. Depths and rates of any water losses;
11. Depth to static water level;
12. Depths at which drilling problems occur and how the problems are solved;
13. Total boring depth;
14. Reason for terminating borehole;
15. Surface elevation; and
16. VOC readings of split spoon samples.

After the boring is completed, it will be filled to the ground surface with lean grout containing at least 3% bentonite powder by volume. The cement/bentonite grout seal will be placed from the bottom of the boring to approximately 3 feet below the land surface by pouring the mixture into the hole. The grout mixture will consist of Portland cement (ASTM C 150-86) and water in the proportion of not more than 7.0 to 8.0 gallons (gal) of clean water per bag of cement [1 cubic foot (ft^3) or 94 pounds (lb)]. Additionally, 3 percent by weight of bentonite powder will be added to help reduce shrinkage of the grout mixture. The grout will be allowed to set a minimum of 48 hours. If the borehole is greater than 15 feet and groundwater is present in the borehole, the grout will be pumped through a tremie pipe to the bottom of the boring. Grout will be pumped in until undiluted grout discharges from the bore hole at the ground surface. A bentonite backfill consisting of bentonite pellets will be placed from the top of the cement/bentonite grout seal to the ground surface and allowed to hydrate.

Split spoon barrels will be decontaminated as described in Section 6 of this specification. Drilling augers will be steam cleaned along with other drilling equipment between boring locations.

1.3 Health and Safety Procedures

All soil boring and sampling will be performed in accordance with the health and safety procedures described in Appendix B of the Generic Work. At SWMUs where there is a potential for UXOs and explosives, access routes and sampling work areas will be searched by UXO personnel prior to soil sampling operations. The boundaries of the access routes will be marked with orange survey flags. All UXOs located during the search operation will be flagged with yellow survey markers.

Remote drilling and test pitting by UXO personnel will be performed at locations deemed advisable by the Project Manager and UXO personnel.

All samples collected during the soil sampling operations at potentially UXO SWMUs will be inspected by UXO personnel for small UXO components prior to on-site testing or shipment for off-site laboratory testing. In areas heavily contaminated by UXOs or UXO components, samples will be collected by UXO personnel.

2 MONITORING WELL INSTALLATION

This section outlines the installation of stainless steel overburden monitoring wells. A 4 1/4-inch or 6 1/4-inch hollow-stem auger will be used to drill the borings and install the overburden wells.

All activities described in this procedure will be overseen by a qualified geologist.

2.1 Objectives

The objectives of this task are to install monitoring wells that will provide long term monitoring points for collection of representative samples of groundwater and accurate determinations of piezometric head in the till/weathered shale (i.e., overburden) aquifer. The wells will have a maximum screen length of ten feet and will be screened across the water table and through the entire till/weathered shale aquifer if possible. Based on depth to water measurements and boring logs from previous reports on the Seneca Army Depot Facility, the water table occurs within the till.

2.2 Decontamination of Equipment

Every appropriate precaution must be taken during drilling and construction of monitoring wells to avoid introducing contamination into the borehole. All equipment to be placed into the boring will be decontaminated before use at the site and between boreholes using EPA Region II and NYSDEC protocols (Section 6 of this specification). Equipment must be steam-cleaned between holes and only non-chlorinated potable water may be used during drilling operations, unless otherwise approved by the NYSDEC. Stainless steel well materials must be steam cleaned prior to being installed.

2.3 Well Installation

This section provides information on installation of overburden monitoring wells.

Proper design, construction, and installation of the proposed monitoring wells are essential for accurate interpretation of the groundwater data. The program to be implemented is consistent with the USEPA Region II CERCLA QA Manual and the NYSDEC Technical and Administrative Guidance Manuals (TAGMS) regarding design, installation, development and collection of groundwater samples. Further, the program is in compliance with all requirements described in the NYSDEC, 6 NYCRR Part 360, Solid Waste Management Facilities Regulations, Section 360-2.11, which details groundwater monitoring well requirements.

The installation of each monitoring well will begin after the boring has been completed. Only one well will be installed in each boring. Installation will begin within 48 hours for fully cased boreholes. Once installation has begun, no breaks in the installation process will be made until the well has been grouted and the drill casing removed.

Overburden wells will be installed using hollow-stem augers. These wells will be constructed of stainless steel and screened from 3 feet above the water table to the top of competent bedrock. Figures A-5 and A-8 illustrate the typical overburden monitoring well details. Water table variations, site stratigraphy, expected contaminant flow will also be considered in determining the screen length and position. Previous well logs and current fieldwork suggest these wells will not be more than 20 feet deep with well screen lengths of 10 feet or less. Soil split spoon samples will be collected continuously as the auger penetrates the formation. Soil samples will be collected as described in the soil boring program. The monitoring wells will be constructed of new 2-inch stainless steel, wire-wrapped screens as required by NYSDEC and USEPA Region II with an expected screen slot size of 0.010" and threaded, flush joints that contain a rubber gasket. No solvents, glues, or other adhesives will be used to connect the stainless steel casing. A silt sump "point" will be placed at the bottom of each well. A locking cap will be paced on the end of the riser pipe.

Several methods for sizing filter materials and well screen openings are available in the literature. The methods are cited in Aller et al., (1989), Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells, Environmental Monitoring Systems Laboratory Office of Research and Development, U.S. Environmental Protection Agency, Las Vegas, Nevada, EPA 600/4-89/034, and Driscoll, F.G. (1988) Groundwater and Wells. Most methods are similar in concept and do not differ appreciably in their results. The first step in designing the filter pack is to obtain sieve analyses on the sample of the formation intended to be monitored. The filter pack material size is selected on the basis of the finest formation materials present.

A sand pack will be placed by pouring sand from the surface into in the annular space between the well screen and the hollow stem auger. If the well is greater than 15 feet deep, a tremie pipe will be used to place the sand pack. The sand pack will not extend more than 2 feet (but at least 6 inches) above the top, or 6 inches below the bottom of the screen. A finer grained sand pack material, 6 inches thick, will be placed at the top of the sand pack, between the sand pack and the bentonite seal to prevent infiltration of the bentonite into the sand pack around the well screen. A layer of bentonite pellets, between 1 and 2 feet thick, will be used to seal the well and will be poured within the annular space. Potable water will be poured on the pellets periodically during their installation to ensure they are hydrated properly. Then, the remaining annular space will be completely filled with a lean cement grout containing at least 3% by weight bentonite to cement. The grout mixture will be placed in the annular space by pouring it from the surface.

In all instances, wells will be protected with a steel casing, at least 4 inches in diameter in untrafficed areas. This protective steel casing will extend 3 ½ feet below the ground surface to prevent heaving by frost. The depth of the protective casing may be reduced to allow for better well construction in shallow bedrock situations. However, in this instance the casing should be shortened so that no more than 2.5 feet stick up above the ground surface. The protective casing will have a locking cap and a brass, weather resistant padlock. Duplicate keys will be obtained. A cement collar will surround the well. A weep hole will be drilled at the base of the protective steel casing above the cement collar to allow drainage of water. A locking expandable cap will also be placed in the top of the well casing. This cap will provide protection from inappropriate filling of the well, should the protective casing lock be broken. To allow the water in the well to equilibrate when the expandable cap is tightened, a small slot shall be cut in the PVC well pipe 1-inch below the base of the expandable well cap. A permanent well identification marker will be attached to the steel protective casing.

Three protective ballards will be placed around each monitoring well that has a steel-protective casing. The bollards will be placed 3 feet from the well. At each bollard location, from 2 to 2.5 feet of the bollard shall be cemented below the ground surface and at least 2.5 feet shall be exposed above the ground surface. Care should be taken to ensure that the ballard is not cemented at depth that corresponds with the screened section of the well.

The monitoring well protective casings will be marked with the well number using metal stamps, a metal plate pop riveted to the steel casing, not to the cover, or paint on the pipe, not the cover. The details of well installation will be recorded.

3 MONITORING WELL DEVELOPMENT

3.1 Objectives

The purpose of this task is to remove sediment and fines from the well and surrounding soil so that a representative sample of the groundwater can be obtained.

3.2 Monitoring Well Development

The development of monitoring wells will be performed 2 to 7 days after well installation and at least 7 days before well sampling and water elevation monitoring activities.

If necessary, access routes and sampling work areas where UXOs are potentially present will be searched by UXO personnel prior to monitoring well development and sampling operations (boundaries of the access routes will have been previously marked with orange survey flags). All UXOs located during the search operation will be flagged with yellow survey markers. In areas heavily contaminated by UXOs or UXO components, well development and groundwater sampling could be performed by UXO personnel.

Development of wells will be accomplished by light surging and removal of water with a bailer or surge block followed by pumping with peristaltic pump. Water will not be added to the well to aid in development. All development equipment will be decontaminated prior to use in each well. The decontamination procedures for downhole development equipment and the bailer are provided in Section 6 of this specification.

As the wells may be slow to recharge due to the low permeability of the formation, surging and overpumping may need to be performed numerous times on each well, with complete recharge between each episode. Every attempt will be made to remove excessive turbidity from the wells because high turbidity can result in elevated metal concentrations detected in the groundwater. A well development report will be completed, as shown on Figure A-12, Well Development Report.

Note: the fined-grained nature of aquifer material means that it is unlikely that all of the "fines" will be removed from the area around the well during development. To reduce turbidity of the ground water for successive sampling events, end the well development procedure will low flow purging using a peristaltic pump.

3.3 Development Criteria

Each monitoring well will be developed to assist in ensuring the collection of representative groundwater samples. The criteria for determining if the well has been properly developed is based upon the guidance provided by the NYSDEC, TAGM #HWR-88-4015. This guidance document specifies an upper level of allowable levels of turbidity in groundwater from monitoring wells which is considered acceptable for determining the water quality of metals in the aquifer. This policy does not apply to surface waters.

The development procedure consists of light surging with a surge block for 2 to 5 minutes, with periodic removal of water using a bailer. The light surging is performed to remove any silt and clay "skin" that may have formed on the borehole wall during drilling. After surging, the water in the well is to be removed using a peristaltic pump (or similar pump) at a rate of between 1.5 and 3 liters per minute. The relatively low flow rate of water removal from the well is to allow for development of the well and the surrounding formation by removing some silt and clay, while not creating an influx of large amounts of silt and clay, which are major components of the till.

Prior to the beginning of well development, any water lost during the drilling process will be removed. Development operations shall be performed until the following primary conditions are met:

1. Water samples will have the lowest possible NTUs (preferably $<$ 50 NTUs); and
2. The temperature, specific conductivity and pH of the well water vary by no more than 10 percent over 2 consecutive readings. Readings will be conducted for each well volume.

In addition to meeting the above primary conditions, removal of at least three well volumes of water from the well is a secondary condition that should be met if the well will allow. If not, remove as much water as necessary to meet the primary conditions, but at least one well volume.

Temperature, specific conductivity and pH will be measured in the field. A nephelometer will be used to measure turbidity. The instruction manuals for these instruments will be kept with the instruments in the field.

3.4 Well Survey

The locations and elevations of all existing and newly installed monitoring wells must be surveyed to obtain their location which is then plotted on a map in the hydrogeologic report. The location of each well will be tied to the New York State coordinate system. The ground surface elevation, the top of the monitoring well riser pipe and the top rim of the protective steel casing (with the top open) must be accurately measured to the nearest one-hundredth of a foot. The elevation of the riser pipe will be made at a notch cut into the lip of the pipe. The plug or cap covering the well will be removed for this measurement.

4 SURVEYING

Any surveying performed at SEDA will provide accurate site base maps which will be used for the following purposes:

1. Map the direction and compute the velocity of groundwater movement,
2. Locate all the environmental sampling points,
3. Serve as the basis for volume estimates of impacted soils and sediments which may require a remedial action, and
4. Map the extent of any impacted groundwater above established ARAR limits.

Additional surveying will conform to the specifications cited below. The survey will involve photogrametric mapping, followed by a field survey. By having an aerial photographic survey performed for the site, the site topographic data can be electronically inputted to the software on AutoCad System. This approach will produce more accurate site maps and since the software stores the data as a 3-dimensional file, it will facilitate a great deal more flexibility in its future use. Typical examples of what this software can produce automatically are stormwater run-off calculations, cut and fill calculations, and graphical cross-section through any part of the site. The field control will establish horizontal and vertical control and will serve as the basis for relating the photogrametric information to actual land elevations and the New York State Plane Coordinate System.

4.1 Field Surveying

During the field survey, plastic or wooden hubs shall be used for all basic control points. A minimum of two (2) concrete monuments with 3.25-inch domed brass or aluminum alloy survey markers (caps) and witness posts will be established at the site. The concrete monuments will be located within the project limits and will be set 50 feet from the edge of any existing roads in the interior of the project limits and will be a minimum of 500 feet apart. The placement of all monuments, hubs, etc., shall be coordinated with SEDA. Witness posts, etc., shall be durable and brightly colored to preclude damage due to normal landscaping activities. Concrete monuments shall be constructed so as to preclude damage due to frost action. Horizontal control (1:10,000) and vertical control (1:5,000) of third-order or better shall be established for the network required for all the monuments. The caps for new monuments shall be stamped in a consecutively numbered sequence (e.g., SEAD-#-year, USAED-Huntsville).

The dies for stamping the numbers and letters into these caps shall be of 1/8 inch in size. All coordinates will be to the closest 0.01 foot and will be referenced to the State Plane Coordinate System and all elevations are to be referenced to the 1929 North American Vertical Datum. Elevations to the closest 0.10 foot shall be provided for the ground surface at each soil boring. Elevations to the closest 0.01 foot shall also be established for the survey marker and the top of casing (measuring point) at each monitoring well.

The location, identification, coordinates and elevations of all the control points recovered and/or established at the site and all of the geophysical survey areas, soil borings, monitoring wells (new and existing) and all surface water sampling points will be plotted on a topographic map (at a scale of 1 inch = 50 feet) to show their location with respect to surface features within the project area. A tabulated list of the monuments, the soil borings and the surface water sample points including their coordinates and elevations, a "Description Card" for each monument established or used for this project, the 1 inch = 50 feet map and all field books and computations will be prepared. The tabulation shall consist of the designated number of each boring, monument or surface water sampling point, the X- and Y-coordinates and all the required elevations. The Description Card shall show a sketch of each monument; its location relative to reference marks, buildings, roads, towers, etc.; written description telling how to locate the monument from a known point; the monument name or number and the adjusted coordinates and elevations.

During the field survey, level circuits will close on a benchmark whose elevation is known (other than the starting benchmark is possible). The following criteria will be met in conducting the survey:

- Instruments will be pegged regularly;
- Rod levels will be used;
- Foresight and backsight distances will be reasonably balanced; and,
- Elevation readings will be recorded to 0.01 foot.

Temporary monuments will be set and referenced for future recovery. All monuments will be described in the field notes. Sufficient description will be provided to facilitate their recovery.

Traverses will be closed and adjusted in the following manner:

- Bearing closures will be computed and adjusted, if within limits;
- Coordinate closures will be computed using adjusted bearings and unadjusted field distances;
- Coordinate positions will be adjusted if the traverse closes within the specified limits. The method of adjusting shall be determined by the surveyor;
- Final adjusted coordinates will be labeled as "adjusted coordinates." Field coordinates will be specifically identified as such; and
- The direction and length of the unadjusted error of closure, the ratio of error over traverse length, and the method of adjustment will be printed with the final adjusted coordinates.

Level circuits will be closed and adjusted in the following manner:

- For a single circuit, elevations will be adjusted proportionately, provided the raw closure is within the prescribed limits for that circuit; and
- In a level net where the elevation of a point is established by more than one circuit, the method of adjustment will consider the length of each circuit, the closure of each circuit, and the combined effect of all the separate circuit closures on the total net adjustment.

For this project, all surveys shall be third-order plane surveys as defined by the following standards and specifications:

<u>Traverse</u>

Standard error of the mean for length measurements	1 in 10,000
Position closure per loop in feet after azimuth adjustment	1:5,000 checkpoint or 3.34 M** (whichever is smaller)

<u>Leveling</u>

Levels error of closure per loop in feet	0.05 M**

M** is the square root of distance in miles.

Third-order plane surveys and horizontal angular measurements will be made with a 20-second or better transit. Angles will be doubled, with the mean of the doubled angle within 10 seconds of the first angle. Distance measurements will be made with a calibrated tape corrected for temperature and tension or with a calibrated electronic distance meter instrument (EDMI). When using EDMI, the manufacturer's parts per million (ppm) error is applied, as well as corrections for curvature and refraction.

Site surveys will be performed in accordance with good land surveying practices and will conform to all pertinent state laws and regulations governing land surveying. The surveyor shall be licensed and registered in New York. Upon completion of the project, all original field notebooks, computations, and pertinent reference materials will be available at the surveyor's office. Photostatic copies of these materials will be kept in the project files.

All field note reduction will be checked and marked in such a way that a visual inspection of the field notes will confirm that checks have been made. All office entries in field notebooks will be made in colored pencil. The office worker who reduces or checks field notes will initial each page worked on in the color used on that page.

Monitoring well locations will be surveyed only after the installation of the tamperproof locking cap guard pipe or road box, which will be set in concrete. The following elevations will be measured:

- Top of the outer protective casing at the point opposite the lock or bolt on the guard pipe or road box;.
- Top of the inner PVC riser pipe (on the lip, not the cap); and
- Finished concrete pad adjacent to the outer well casing.

5 INVESTIGATION-GENERATED WASTE MANAGEMENT

All soil and water generated during drilling and well development and purging will be collected on-site. All drill cuttings, well development water, purge water generated during sampling, and decontamination liquids will be contained in approved 55-gallon drums. All drums will be labeled as to contents and origins using commercially available, all-weather labels. Investigation derived waste information for each SWMU will be recorded on Figure A-25. At the end of each phase of drilling, documentation lists of the required chemical analyses, evaluation of site conditions and knowledge of regulatory requirements) will be provided which will recommend the disposition for each drum. For each drum considered to contain contaminated material, a specific optimum method of disposal will be recommended, along with a price for disposal. The material will be disposed under manifest, using the SEDA RCRA disposal permit. SEDA is the generator and ultimate signatory of transport and disposal manifests.

In the case of soil excavated from test pits, the Army has been granted a written exemption from USEPA allowing test pit soil to be backfilled in lieu of testing and possible management as a waste. Please refer to the exemption letter from EPA to the U.S. Army, dated September 16, 1991, attached at the end of this appendix.

6 EQUIPMENT AND MATERIAL DECONTAMINATION

All equipment used during the collection, preparation, preservation, and storage of environmental samples must be cleaned prior to their use and after each subsequent use. Frequently, sampling equipment must be cleaned between successive uses in the field to prevent cross contamination. When field cleaning is needed, it is essential that it be conducted diligently, to ensure that all parts of the field equipment that come in contact with the sample are properly decontaminated.

Supplies needed for cleaning or decontamination is dependent upon the materials and equipment to be cleaned. When small items require cleaning in the field, several small buckets and small containers of reagents or wash liquids are adequate. However, when major items, such as large pumps, require decontamination, it may be necessary to transport large wash basins and larger volumes of washing solutions. The following is a general equipment list for field decontamination operations.

1. Detergent, such as Alconox;
2. Potable water;
3. Demonstrated analyte free water;
4. Methanol;
5. Hexane and/or other suitable solvents to remove petroleum products;
6. Storage vessels to transport large volumes of water to the site;
7. Buckets for washing and rinsing equipment;
8. Paper towels, clean rags or chemwipes to remove excessive soil or petroleum products before the equipment is decontaminated;
9. Ultrapure HNO_3; and
10. Plastic squeeze bottles for rinsing equipment;

The following procedure will be used to decontaminate the sampling equipment (e.g., split spoons, syringes, bowls, scoops, bailers, soil gas sampling rods and points):

1. Wipe with rag, towel or chemwipes, or steam clean to remove excess soils or debris;
2. Wash and scrub with low phosphate detergent;
3. Tap water rinse;
4. Rinse with 10% HNO_3, ultrapure, on stainless steel equipment;
5. Tap water rinse;

6. Rinse with high-purity methanol followed by hexane rinse;
7. Rinse well with demonstrated analyte free water;
8. Air dry; and
9. Use equipment immediately or wrap in clean aluminum foil or teflon film for temporary storage.

When it is necessary to use split spoon sampling devices which are composed of carbon steel instead of stainless steel, the nitric acid rinse may be lowered to a concentration of 1% instead of 10% so as to reduce the possibility of leaching metals from the spoon itself.

Rinse water level tapes and slugs (slug testing) with tap water, followed by demonstrated analyte-free water. Place in a polyethylene bag to prevent contamination during storage or transit.

Clean submersible pumps used for purging the deep wells prior to use and between wells by pumping copious amounts of tap water through the pumps and associated hoses, followed by rinsing with demonstrated analyte-free water. Clean the exterior of the submersible pumps and hoses that contact formation water by washing with detergent/water solution, followed by a tap water rinse, and a final rinse with demonstrated analyte-free water. Dedicate all tubing to individual wells or dispose of it, i.e., do not reuse tubing. To prevent degradation of or damage to submersible pump seals, impellers, and electric motors, do not rinse with solvents and/or acids.

Drilling equipment, such as augers, mud tubs, downhole hammers and drill rods, and backhoe buckets will be steam cleaned before use at each location and at the end of the job before going off-site.

7 RECORD KEEPING PROCEDURES

Most of the sampling data and well installation information will be written on the forms presented in this appendix. Log books will be used to record the daily activities of each sampling team but they should also be used to record any data not entered into the standard forms.

7.1.1 Daily Inspector Report

Daily Inspector Report should be completed for each field team (Figure A-29). The information on the form should provide an indication of the tasks activities performed by the field team during the course of the day. Information regarding non-productive time and waste management should also be included on this form. These forms shall be kept in the on-site files.

7.1.2 Daily Field Summary

A Daily Field Summary form should be completed by the site manager at the end of each day (Figure A-30). This form should provide an overall indication of the tasks/activities performed on a particular day. These forms shall be kept in the on-site files.

7.1.3 Photographs

Photographs of all sampling locations and operations are desirable, although they frequently will not be allowed. If photographs are taken, the photographer should record time, date, site location, and brief description of the subject on the back of the photo, (polaroid) or in a log book and then sign it. Photographic documentation that may be used as evidence should be handled in a way to ensure that chain-of-custody can be established.

OVERBURDEN BORING REPORT

ENGINEERING-SCIENCE, INC.	CLIENT:	BORING NO.:

PROJECT : ______________________

LOCATION : ______________________

JOB NO. : ______

EST. GROUND ELEV.: ______

START DATE: ______

FINISH DATE: ______

CONTRACTOR: ______

DRILLER: ______

INSPECTOR: ______

CHECKED BY: ______

CHECK DATE: ______

DRILLING SUMMARY:

DRILLING	HOLE	DEPTH	SAMPLER		HAMMER	
METHOD	DIA.	INT.	SIZE	TYPE	TYPE	WT/FALL

DRILLING ACRONYMS:

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUPMENT SUMMARY

INSTRUMENT	DETECTOR	RANGE	BACKGROUND			CALIBRATION		
TYPE	TYPE/ENERGY		READING	TIME	DATE	TIME	DATE	WEATHER

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION		

QA/QC:

QA/QC SAMPLES COLLECTED: YES or NO

Duplicate Sample Number:

MRD Sample Number:

QA/QC Rinsate Sample Number:

INVESTIGATION DERIVED WASTE:

AMOUNT OF SOIL DRUMMED: ______

DRUM NUMBER: ______

OVERBURDEN BORING REPORT

ENGINEERING-SCIENCE, INC.	CLIENT:	BORING #:

MONITORING				COMMENTS:	
INSTRUMENT	INTERVAL	BGD	TIME		DRILLER:
					INSPECTOR:
					DATE:

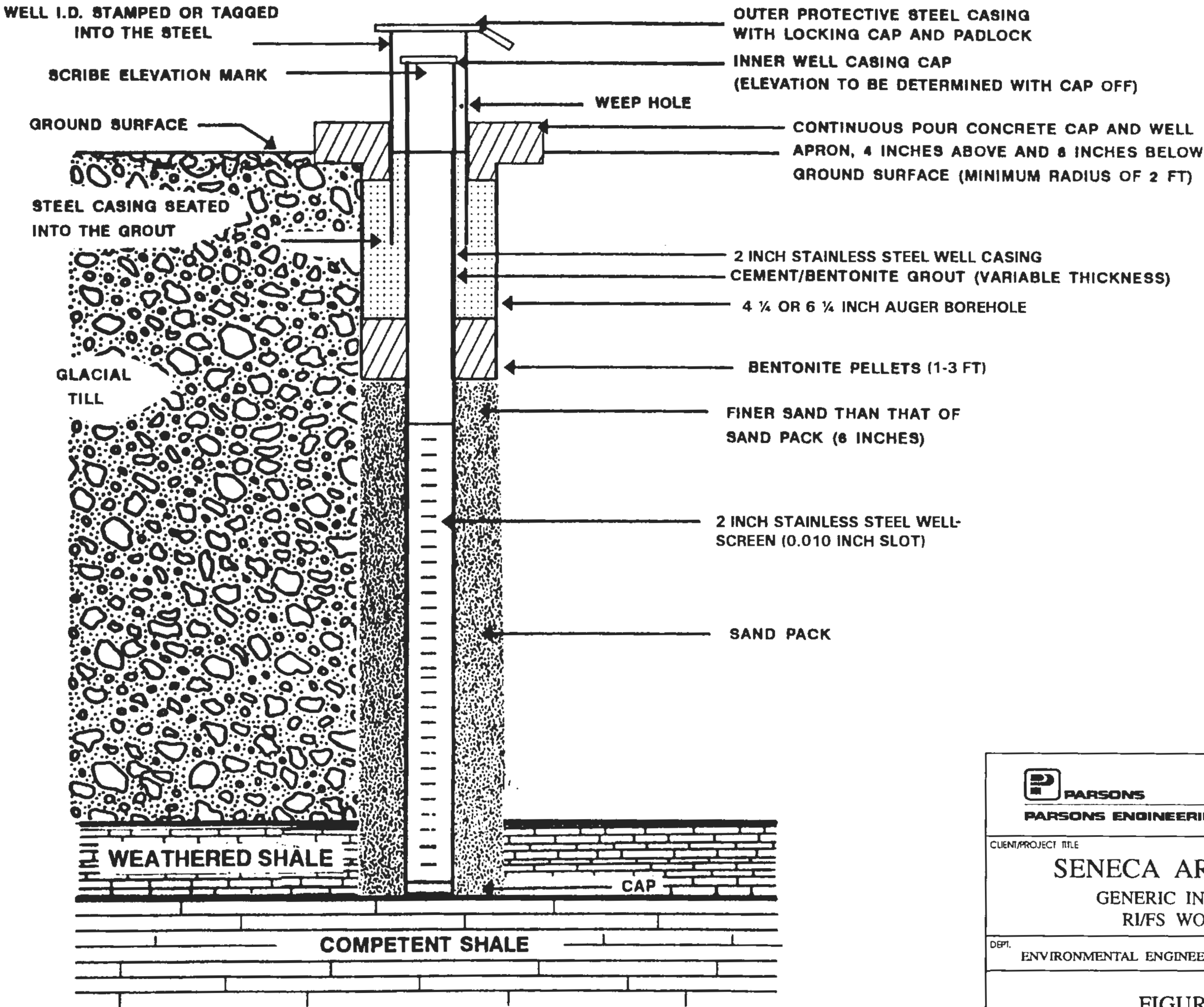
DEPTH (FT)	SAMPLING			SAMPLE				SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	BLOWS PER 6 INCHES	PENE-TRATION RANGE (FEET)	RECOV-ERY RANGE (FEET)	DEPTH INT (FEET)	NO.	VOC	RAD SCRN			
5										
10										
15										
20										

OVERBURDEN BORING REPORT

ENGINEERING-SCIENCE, INC.	CLIENT:	BORING #:

MONITORING				COMMENTS:	
INSTRUMENT	INTERVAL	BGD	TIME		DRILLER:
					INSPECTOR:
					DATE:

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS



* 3 PROTECTIVE BOLLARDS WILL BE PLACED AROUND THE WELL

PARSONS
PARSONS ENGINEERING SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT
GENERIC INSTALLATION
RI/FS WORK PLAN

DEPT. ENVIRONMENTAL ENGINEERING | DWG NO.

FIGURE A-5

OVERBURDEN
MONITORING WELL DETAIL

SCALE | DATE AUGUST 1998

OVERBURDEN MONITORING WELL
COMPLETION REPORT & INSTALLATION DETAIL
PROTECTIVE RISER COMPLETION

ENGINEERING-SCIENCE, INC.	CLIENT:	WELL #:

PROJECT: ____________________ PROJECT NO: ____________________
LOCATION: ____________________ INSPECTOR: ____________________
CHECKED BY: ____________________

DRILLING CONTRACTOR: ____________________ POW DEPTH: ____________
DRILLER: ____________________ INSTALLATION STARTED: ____________
DRILLING COMPLETED: ____________________ INSTALLATION COMPLETED: ____________
BORING DEPTH: ____________________ SURFACE COMPLETION DATE: ____________
DRILLING METHOD(S): ____________________ COMPLETION CONTRACTOR/CREW: ____________
BORING DIAMETER(S): ____________________ BEDROCK CONFIRMED (Y/N?) ____________
ASSOCIATED SWMU/AOC: ____________________ ESTIMATED GROUND ELEVATION: ____________

PROTECTIVE SURFACE CASING:
DIAMETER: ____________ LENGTH: ____________

RISER:
TR: ________ TYPE: ________ DIAMETER: ________ LENGTH: ________

SCREEN:
TSC: ________ TYPE: ________ DIAMETER: ________ LENGTH: ________ SLOT SIZE: ________

POINT OF WELL: (SILT SUMP)
TYPE: ________ BSC: ________ POW: ________

GROUT:
TG: ________ TYPE: ________ LENGTH: ________

SEAL: TBS: ________ TYPE: ________ LENGTH: ________

SAND PACK: TSP: ________ TYPE: ________ LENGTH: ________

SURFACE COLLAR:
TYPE: ________ RADIUS: ________ THICKNESS CENTER: ________ THICKNESS EDGE: ________

CENTRALIZER DEPTHS
DEPTH 1: ________ DEPTH 2: ________ DEPTH 3: ________ DEPTH 4: ________

COMMENTS:

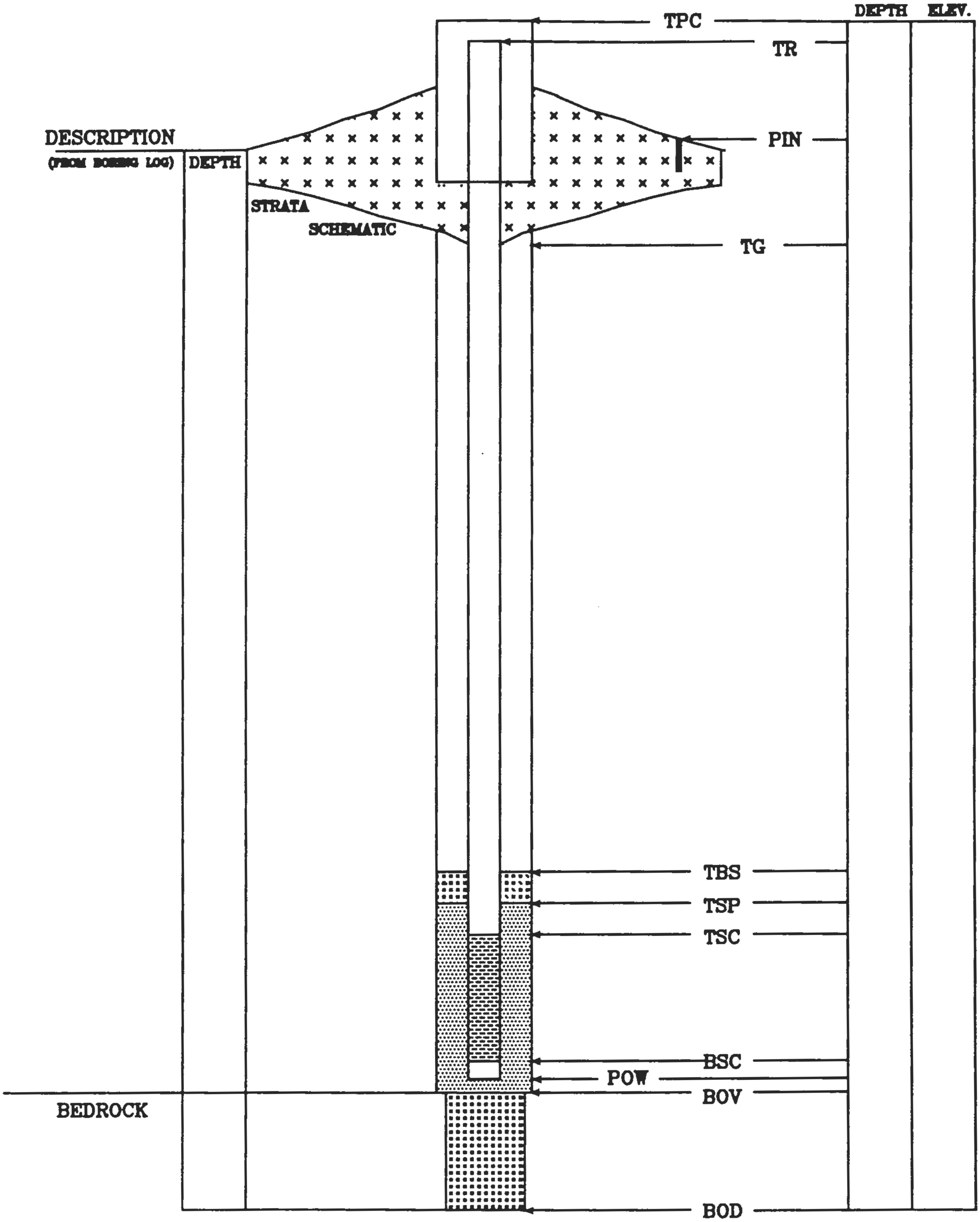
* ALL DEPTH MEASUREMENTS REFERENCED TO GROUND SURFACE

SEE PAGE 2 FOR SCHEMATIC

OVERBURDEN MONITORING WELL
PROTECTIVE RISER INSTALLATION DETAIL

ENGINEERING–SCIENCE, INC.	CLIENT:	WELL #:

DATE: ______________



* NOT TO SCALE

WELL DEVELOPMENT REPORT

ENGINEERING-SCIENCE, INC.	CLIENT:	WELL #:

PROJECT : ______________________________

LOCATION: ______________________________

DATE: ______________

PROJECT NO. : ______________

DRILLING METHOD (s): ______________________

PUMP METHOD (s): ______________________

SURGE METHOD (s): ______________________

INSTALLATION DATE: ______________________

INSPECTOR: ______________________

CONTRACTOR: ______________________

CREW: ______________________

START DEVELOPMENT DATE: ______________________

END DEVELOPMENT DATE: ______________________

WATER DEPTH (TOC): ______________ ft

WELL DIA. (ID CASING): ______________ ft

BORING DIAMETER: ______________ ft

INSTALLED POW DEPTH(TOC): ______________ ft

MEASURED POW DEPTH(TOC): ______________ ft

SILT THICKNESS: ______________ ft

POW AFTER DEVELOPMENT: ______________ ft

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	2	3	4	5	6	7	8	9	10	11	12
GALLONS/ FT:	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	4.08	4.93	5.87

STANDING VOLUME INSIDE WELL = WATER COLUMN X WELL DIAMETER FACTOR = ________ GAL. = A

STANDING WATER IN ANNULAR SPACE =
WATER COL. BELOW SEAL(ft) X (BORING DIAM. FACTOR - WELL DIAM. FACTOR) X 0.3 = ________ GAL. = B

SINGLE STANDING WATER VOLUME = A + B = ... ________ GAL. = C

MINIMUM VOLUME TO BE REMOVED = 5 X C .... ________ GALS.

ACTIVITY	START TIME	END TIME	ELAPSED TIME	GALLONS REMOVED	pH	CONDUCTIVITY	TEMP	COLOR	OTHER
TOTALS/FINAL									

COMMENTS:

DAILY INSPECTOR REPORT

ENGINEERING - SCIENCE, INC.	CLIENT:	DATE:

PROJECT : ____________ PROJECT NO. : ____________

LOCATION: ____________ INSPECTOR : ____________

CONTRACTOR : ____________

WEATHER: AM ________ START TIME: ________ TOTAL CREW : ________

PM ________ END TIME: ________ HOURS: ________ RIG # : ________

LOCATION	H & S LEVEL	METHOD/ ITEM	PROJECTED DEPTH	START DEPTH	END DEPTH	TOTAL FOOTAGE	SAMPLE INTERVAL	# ITEMS/ SAMPLES

NON-PRODUCTIVE TIME

LOCATION	REASON	ACTION TAKEN	TIME DOWN

WASTE MANAGEMENT INFORMATION

LOCATION	SPOIL TYPE ON SITE	DRUMS / CONTAINERS FILLED	DRUMS / CONTAINERS USED	COMMENTS

COMMENTS: (visitors, general remarks, etc.)

INSPECTOR: ____________

DAILY FIELD SUMMARY

ENGINEERING-SCIENCE, INC.	CLIENT:	DATE:

CLIENT/PROJECT :	PROJECT NO. :
LOCATION:	CHECKED BY:

DRILLING SUMMARY

RIG	LOCATION	INSPECTOR	ACTIVITY METHOD	TOTAL FOOTAGE	NUMBER OF SAMPLES	EOD DEPTH	COMMENTS

OTHER ACTIVITIES

MAN/CREW	LOCATION	INSPECTOR	ACTIVITY	COMMENTS

COMMENTS: (general)

Appendix I
Guide Specification 02546 Aggregate Surface Course

****

DEPARTMENT OF THE ARMY | CEGS-02546 (April 1989)
U.S. ARMY CORPS OF ENGINEERS

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

****

SECTION 02546
AGGREGATE SURFACE COURSE
04/89

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 117	\&(1995)&\ Materials Finer Than 75 micrometer (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 131	(1989) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impac in the Los Angeles Machine
ASTM C 136	\&(1995a)&\ Sieve Analysis of Fine and Coarse Aggregates
ASTM D 75	(1987; R 1992) Sampling Aggregates
ASTM D 422	(1963; R 1990) Particle-Size Analysis of Soils

ASTM D 1556	(1990) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.))
ASTM D 2167	\&(1994)&\ Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2922	(1991) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1988; R 1993) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 3740	\&(1994a) Minimum Requirements for&\ Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design an Construction
ASTM D 4318	\&(1993)&\ Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM E 11	\&(1995)&\ Wire-Cloth Sieves for Testing Purposes

1.2 UNIT PRICES

1.2.1 Measurement

The quantity of aggregate surface course completed and accepted as determined by the Contracting Officer will be measured in square yards.

1.2.2 Payment

Quantities of aggregate surface course for roads and airfields, as specified in paragraph Measurement, will be paid for at the respective contract unit prices. Payment will constitute full compensation for the construction and completion of the aggregate surface course, including furnishing all labor and incidentals necessary to complete the work required by this section.

1.3 DEGREE OF COMPACTION

Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated herein as present laboratory maximum density.

1.4 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted:

SD-01 Data

Equipment; [FIO].

List of proposed equipment to be used in performance of construction work including descriptive data.

SD-09 Reports

Sampling and Testing; [GA]. Density Test; [GA].

Calibration curves and related test results prior to using the device or equipment being calibrated. Copies of field test results within 24] hours after the tests are performed. Test results from samples, not less than 30 days before material is required for the work. Results of laboratory tests for quality control purposes, for approval, prior to using the material.

1.5 EQUIPMENT

All plant, equipment, and tools used in the performance of the work covered by this section will be subject to approval by the Contracting Officer before the work is started and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate and shall have the capability of producing the required compaction, and meeting the grade controls, thickness controls, and smoothness requirements set forth herein.

1.6 SAMPLING AND TESTING

Sampling and testing shall be the responsibility of the Contractor. Sampling and testing shall be performed by an approved commercial testing laboratory or by the Contractor, subject to approval. If the Contractor elects to establish testing facilities of his own, approval of such facilities shall be based on compliance with ASTM D 3740, and no work requiring testing will be permitted until the Contractor's facilities have been inspected and approved.

1.6.1 Sampling

Sampling for material gradation, liquid limit, and plastic limit tests shall be taken in conformance with ASTM D 75. When deemed necessary, the sampling will be observed by the Contracting Officer.

1.6.2 Testing

1.6.2.1 Gradation

Aggregate gradation shall be made in conformance with ASTM C 117, ASTM C 136, and ASTM D 422. Sieves shall conform to ASTM E 11.

1.6.2.2 Liquid Limit and Plasticity Index

Liquid limit and plasticity index shall be determined in accordance with

ASTM D 4318.

1.6.3 Approval of Materials

The source of the material to be used for producing aggregates shall be selected 30 days prior to the time the material will be required in the work. Approval of sources not already approved by the Corps of Engineers will be based on an inspection by the Contracting Officer. Tentative approval of materials will be based on appropriate test results on the aggregate source. Final approval of the materials will be based on tests for gradation, liquid limit, and plasticity index performed on samples taken from the completed and compacted surface course.

1.7 WEATHER LIMITATIONS

Aggregate surface courses shall not be constructed when the ambient temperature is below 2 degrees C (35 degrees F) and on subgradesthat are frozen or contai frost. It shall be the responsibility of the
Contractor to protect, by approved method or methods, all areas of surfacing tha have not been accepted by the Contracting Officer. Surfaces damaged by freeze rainfall, or other weather conditions shall be brought to a satisfactory conditio by the Contractor.

PART 2 PRODUCTS

2.1 AGGREGATES

Aggregates shall consist of clean, sound, durable particles of natural gravel, crushed gravel, crushed stone, sand, slag, soil, or other approved materials processed and blended or naturally combined. Aggregates shall be free from lumps and balls of clay, organic matter, objectionable coatings, and other foreign materials. The Contractor shall be responsible for obtaining materials that meet the specification and can be used to meet the grade and smoothness requirements specified herein after all compaction and proof rolling operations have been completed.

2.1.1 Coarse Aggregates

The material retained on the 4.75 mm (No. 4) sieve shall be known as coarse aggregate. Coarse aggregates shall be reasonably uniform in density and quality. The coarse aggregate shall have a percentage of wear not to exceed 50 percent after 500 revolutions as determined by ASTM C 131.
The amount of flat and/or elongated particles shall not exceed 20 percent. A flat particle is one having a ratio of width to thickness greater than three; an elongated particle is one having a ratio of length to width greater than three. When the coarse aggregate is supplied from more than one source, aggregate from each source shall meet the requirements set forth herein.

2.1.2 Fine Aggregates

The material passing the 4.75 mm (No. 4) sieve shall be known as fine aggregate. Fine aggregate shall consist of screenings, sand, soil, or other finely divided mineral matter that is processed or naturally combined with the coarse aggregate.

2.1.3 Gradation Requirements

Gradation requirements specified in TABLE I shall apply to the completed aggregate surface. It shall be the responsibility of the Contractor to obtain materials that will meet the gradation requirements after mixing, placing, compacting, and other operations. TABLE I shows permissible gradings for granular material used in aggregate surface roads and airfields. Sieves shall conform to ASTM E 11.

TABLE I. GRADATION FOR AGGREGATE SURFACE COURSES

Sieve Designation	No. 1	No. 2	No. 3	No. 4
25.0 mm 100	100	100	100	
9.5 mm 50-85	60-100	--	--	
4.7 mm 35-65	50-85	55-100	70-100	
2.00 mm	25-50	40-70	40-100	55-100
0.425 mm	15-30	24-45	20-50	30-70
0.075 mm	8-15	8-15	8-15	8-15

(

TABLE I. GRADATION FOR AGGREGATE SURFACE COURSES

Sieve Designation	No. 1	No. 2	No. 3	No. 4
1 in.	100	100	100	100
3/8 in.	50-85	60-100	--	--
No. 4	35-65	50-85	55-100	70-100
No. 10	25-50	40-70	40-100	55-100
No. 40	15-30	24-45	20-50	30-70
No. 200	8-15	8-15	8-15	8-15

)

2.1.4 Liquid Limit and Plasticity Index

The portion of the completed aggregate surface course passing the 0.425 mm (No. 40) sieve shall have a maximum liquid limit of 35 and a plasticity index of 4 to 9.

PART 3 EXECUTION

3.1 OPERATION OF AGGREGATE SOURCES

Clearing, stripping, and excavating shall be the responsibility of the Contractor. The aggregate sources shall be operated to produce the quantity and quality of materials meeting these specification requirements in the specified time limit. Upon completion of the work, the aggregate sources on Government reservations shall be conditioned to drain readily and be left in a satisfactory condition. Aggregate sources on private lands shall be conditioned in agreement with local laws or authorities.

3.2 STOCKPILING MATERIALS

Prior to stockpiling the material, the storage sites shall be cleared and leveled by the Contractor. All materials, including approved material available from excavation and grading, shall be stockpiled in the manner and at the locations designated. Aggregates shall be stockpiled in such a manner that will prevent segregation. Aggregates and binders obtained from different sources shall be stockpiled separately.

3.3 PREPARATION OF UNDERLYING COURSE SUBGRADE

The underlying course [subgrade], including shoulders, shall be cleaned of all foreign substances. At the time of surface course construction, the underlying course [subgrade] shall contain no frozen material. Ruts or soft yielding spots in the underlying course [subgrade] areas having inadequate compaction and deviations of the surface from the requirements set forth herein shall be corrected by loosening and removing soft or unsatisfactory material and by adding approved material, reshaping to line and grade and recompacting. The completed underlying course [subgrade] shall not be disturbed by traffic or other operations and shall be maintained by the Contractor in a satisfactory condition until the surface course is placed.

3.4 GRADE CONTROL

During construction, the lines and grades including crown and cross slope indicated for the aggregate surface course shall be maintained by means of line and grade stakes placed by the Contracto.r

3.5 MIXING AND PLACING MATERIALS

The materials shall be mixed and placed in such a manner as to obtain uniformity of the material and at a uniform optimum water content for compaction. The Contractor shall make such adjustments in mixing or placing procedures or in equipment so as to obtain the true grades, to minimize segregation and degradation, to obtain the desired water content, and to ensure a satisfactory surface course.

3.6 LAYER THICKNESS

The aggregate material shall be placed on the [underlying course] [subgrade] in layers of uniform thickness. When a compacted layer of 150 mm (6 inches) or less is specified, the material may be placed in a single layer; when a compacted thickness of more than 150 mm (6 inches) is required, no layer shall exceed 150 mm (6 inches) nor be less than 75 mm (3 inches) when compacted.

3.7 COMPACTION

Each layer of the aggregate surface course shall be compacted with approval compaction equipment. The water content during the compaction procedure shall be maintained at optimum or at the percentage specified by the Contracting Officer. In locations not accessible to the rollers, the mixture shall be compacted with mechanical tampers. Compaction shall continue until each layer through the full depth is compacted to at least 100 percent of laboratory maximum density. Any materials that are found to be unsatisfactory shall be removed and replaced with satisfactory material or reworked to produce a satisfactory material.

3.8 PROOF ROLLING

3.9 EDGES OF AGGREGATE-SURFACED ROAD

Approved material shall be placed along the edges of the aggregate surface course in such quantity as to compact to the thickness of the course being constructed. When the course is being constructed in two or more layers, at least 300 mm (1 foot) of shoulder width shall be rolled and compacted simultaneously with the rolling and compacting of each layer of the surface course.

3.10 SMOOTHNESS TEST

The surface of each layer shall not show any deviations in excess of 9.5 mm (3/8 inch) (3/8 inch) when tested with a 3.05 m (10 foot) (10 foot) straightedge applied both parallel with and at right angles to the centerline of the area to be paved. Deviations exceeding this amount shall be corrected by the Contractor by removing material, replacing with new material, or reworking existing material and compacting, as directed.

3.11 THICKNESS CONTROL

The completed thickness of the aggregate surface course shall be within 1/2 inch plus or minus, of the thickness indicated on plans. The thickness of th aggregate surface course shall be measured at intervals in such manner that ther will be a thickness measurement for at least each 500 square yards of th aggregate surface course. The thickness measurement shall be made by test hole at least 3 inches in diameter through the aggregate surface course. When th measured thickness of the aggregate surface course is more than 1/2 inch deficien in thickness, the Contractor, at no additional expense to the Government, shal correct such areas by scarifying, adding mixture of proper gradation, reblading and recompacting, as directed. Where the measured thickness of the aggregat surface course is more than 1/2 inch thicker than that indicated, it shall b considered as conforming with the specified thickness requirements plus1/2 inch The average job thickness shall be the average of the job measurements determine as specified above, but shall be within 1/4 inch of the thickness indicated. Whe the average job thickness fails to meet this criterion, the Contractor shall, a no additional expense to the Government, make corrections by scarifying, adding o removing mixture of proper gradation, and reblading and recompacting, as directed.

3.12 DENSITY TESTS

Density shall be measured in the field in accordance with [ASTM D 1556] [ASTM D 2167] [ASTM D 2922]. [For the method presented in ASTM D1556 the base plate as shown in the drawing shall be used.] [For the method presented in ASTM D 2922 the calibration curves shall be checked and adjusted, if necessary, using only the sand cone method as described in paragraph Calibration of the ASTM publication.] Tests performed in accordance with ASTM D 2922 result in a wet unit weight of soil and when using this method, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall also be checked along with density calibration checks as described in ASTM D 3017.

3.13 WEAR TEST

Wear tests shall be made in conformance with ASTM C 131.

3.14 MAINTENANCE

The aggregate surface course shall be maintained in a condition that will meet all specification requirements until accepted.

-- End of Section --