FINAL

No Further Action Record of Decision

Niagara Falls Armed Forces Reserve Center

9400 Porter Road

Niagara Falls, New York

February 2015

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FIGURES

ACRONYMS AND ABBREVIATIONS

AFRC	Armed Forces Reserve Center
AOC	Area of Concern
bgs	Below Ground Surface
BRAC	Base Realignment and Closure
CALEPA	California Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
Class GA	NYSDEC Class GA Groundwater Effluent Limitations
COC	Contaminant of Concern
CPC	Contaminant of Potential Concern
CSCO	Commercial Soil Cleanup Objective
CSF	Carcinogenic Slope Factor
DERP	Defense Environmental Restoration Program
DPW	Department of Public Works
EPA	Environmental Protection Agency
EPC	Exposure Point Concentration
HHRA	Human Health Risk Assessment
IRA	Interim Remedial Action
IRIS	USEPA Integrated Risk Information System IRIS
mg/kg	Milligrams per Kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
PARS	PARS Environmental, Inc.
PCB	Polychlorinated biphenyl
PID	Photoionization Detector

PP	Proposed Plan
PPRTVs	Provisional Peer Reviewed Toxicity Values
RfD	Reference Doses
RME	Reasonable Maximum Exposure
RI	Remedial Investigation
ROD	Record of Decision
RSC	Regional Support Command
RSL	Regional Screening Level
SARA	Superfund Amendments and Reauthorization Act of 1986
SVOC	Semi-Volatile Organic Compound
TCL	Target Compound List
UCL	Upper Concentration Limit
µg/kg	Micrograms per Kilogram
µg/L	Micrograms per Liter
US	United States
USAR	United States Army Reserve
USCO	Unrestricted Soil Cleanup Objective
USEPA	United States Environmental Protection Agency
USEPA RAGS	USEPA Risk Assessment Guidance for Superfund
USGS	United States Geologic Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

SECTION 1 – DECLARATION

1.1 SITE NAME AND LOCATION

The Niagara Falls Armed Forces Reserve Center (AFRC) is located at 9400 Porter Road in Niagara Falls, New York, hereinafter the "Site." The property is owned by the United States (US) Army. A Site Location Map and Site Plan are included as Figures 1 and 2, respectively.

The Record of Decision (ROD) addresses environmental impacts in the vicinity of a cast iron fire protection main, 500,000-gallon reservoir, 24-inch corrugated metal storm sewer line located on the eastern boundary and the drainage swale located immediately south of the Site (Outfall No. 5). The areas of concern (AOCs) are depicted in Figure 3.

1.2 STATEMENT AND BASIS OF PURPOSE

This ROD selects No Further Action as the Selected Remedy for the AOCs on the southeastern portion of the Site. The AOCs include the former fire protection main, reservoir, corrugated metal storm sewer on the eastern boundary, and drainage swale south of the Site (Outfall No. 5).

The remedy was chosen in accordance with Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

This ROD is based on the conclusions presented in the *Final Remedial Investigation/Interim Remedial Action/Human Health Risk Assessment Report* prepared by PARS Environmental, Inc. (PARS) in December 2014.

New York State Department of Environmental Conservation (NYSDEC) concurs with the selected remedy. Executive Order 12580 delegates the President's decision-making authority to the Army with input and comments by the State, in accordance with CERCLA Sec. 121(f).

1.3 ASSESSMENT OF THE SITE

In 2008, product containing polychlorinated biphenyl (PCB) was observed discharging from a 6-inch diameter cast iron fire protection main into the 24-inch diameter corrugated storm sewer at Outfall No. 5 and then into the drainage swale at the southeast corner of the Site. PCB impacted soils were excavated from the drainage swale to below the NYSDEC maximum contaminant level of 1 milligram per kilogram (mg/kg). After further soil investigation in 2010 and 2011, an interim remedial action in the vicinity of the former excavation removed and disposed of soil from an approximately 10-foot (north-south) by 12-foot (east-west) area to a depth of approximately 5 feet. Approximately 2,000-gallons of perched groundwater was also removed from that excavation. No compounds were detected in the confirmatory samples at concentrations exceeding the applicable (Unrestricted Soil Cleanup Objectives (USCOs) and Commercial Soil Cleanup Objectives (CSCOs).

A total of seven permanent monitoring wells and six temporary well points were then installed as part of a supplemental (i.e., post-removal action) investigation. Benzene was detected in one groundwater sample from one temporary well and tetrachloroethene (TCE) was detected in one

groundwater sample from a different temporary well, both at concentrations slightly above their respective Class GA criteria. No other chemicals were detected above Class GA criteria. Because these prior interim remedial actions removed contaminants that could have resulted in an unacceptable risk to foreseeable users of the Site, the selected remedy is protective of the public health, welfare, and the environment from actual or threatened releases of hazardous substances into the environment.

1.4 DESCRIPTION OF THE SELECTED REMEDY

The US Army, as the lead agency, has determined that No Further Action is the appropriate remedy for the AOCs. This determination is based on the findings of the corrected human health risk assessment (HHRA) that concluded that following the Interim Removal Action there were no remaining unacceptable risks from exposure to soil and groundwater for the commercial/industrial worker or construction worker, and Army's determination that residential use of the property is not reasonably anticipated.

The future reuse within the area of the Site where the AOCs are located includes a paved parking lot and commercial building. Residential use of the Site is not reasonably anticipated due to the close proximity to the airport runways, hangers, and taxiway as well as the adjacent light industrial zoning and the Town of Niagara Local Reuse Authority's future use for commercial/industrial purposes. A restriction prohibiting residential land use and groundwater use will be included in the deed transferring the Site.

1.5 STATUTORY DETERMINATIONS

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that were applicable or relevant and appropriate to the remedial action, and is cost-effective.

The remedy in this OU does not satisfy the statutory preference for treatment as a principal element of the remedy because the interim remedial action was limited to only the removal of a few cubic yards of soil and several thousand gallons of collected water. On-site treatment could not have been economically conducted. To the extent necessary for disposal, treatment was conducted at the disposal facilities.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

1.6 ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record file for this site.

- Chemicals of concern and their respective concentrations.
- Baseline risk represented by the chemicals of concern.
- Cleanup levels established for chemicals of concern and the basis for these levels.
- How source materials constituting principal threats are addressed.

- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of ground water used in the baseline risk assessment and ROD.
- Potential land and ground-water use that will be available at the site as a result of the Selected Remedy
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected.
- Key factor(s) that led to selecting the remedy (i.e., describe how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision).

1.7 AUTHORIZING SIGNATURE

The US Army, as the lead agency, has determined that No Further Action is appropriate for the AOCs. This remedy is protective of human health and the environment for the current and reasonably anticipated use of the Site.

Thomas E Lederle 3 APRIL 2015

Thomas E. Lederle
Chief, Base Realignment and Closure Division

SECTION 2 – DECISION SUMMARY

2.1 SITE NAME, LOCATION AND DESCRIPTION

The Site is located at 9400 Porter Road in Niagara Falls, New York, hereinafter the "Site." The Site is an approximate 19.5 acre parcel located in the southern portion of Niagara Township, in Niagara Falls, Niagara County, New York. A Site Location Map is included as Figure 1.

The US Army is conducting response actions at the Site in accordance with the Defense Environmental Restoration Program (DERP), which requires that these activities be conducted in accordance with CERCLA and the NCP. Although the US Army is conducting activities at the Site in accordance with CERCLA, the Site is not included on the National Priorities List (NPL) nor has the U.S. Environmental Protection Agency (USEPA) included the Site in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS).

The Site is currently vacant and was formerly a national defense facility. Future land use for the Site is commercial/industrial. Residential use of the Site is not reasonably anticipated due to the close proximity to the airport.

Surface and storm water drainage is to Cayuga Creek located immediately west of the Site. Cayuga Creek is an intermittent tributary of the Niagara River. Storm sewer lines, drainage swales and outfalls are depicted in Figure 2.

The Site is bounded to the south by Porter Road and the property located immediately south of Porter Road is undeveloped forested land. Niagara Falls International Airport is adjacent to the north and east of the Site boundaries. Other properties in the vicinity of the Site are used primarily for commercial purposes.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The United States Government acquired the Site in 1955 and at that time the United States Navy used the Site to service helicopters and airplanes. Most of the buildings at the Site were constructed by 1956. The US Army obtained the Site from the Navy in 1962. From 1970 to 1975, the Site was used to service Nike Missiles from missile batteries around the State of New York.

The Site was most recently occupied by the 277th Quartermaster Company, the 865th Combat Support Hospital, the 1982nd Forward Surgical Unit and Area Maintenance Support Activity 76. A small presence was also maintained by personnel of the Department of Public Works (DPW), Fort Drum, New York (*Environmental Condition of Property Report*, CH2MHill, June 2007). No personnel or units have occupied the Site as of September 15, 2011 per Based Realignment and Closure (BRAC) law.

There has not been any CERCLA enforcement activity at this Site.

2.3 COMMUNITY PARTICIPATION

The US Army issued the Proposed Plan (PP) Report (PARS Environmental 2013c) to the community as part of its public participation responsibilities to inform the public of the US Army's preferred remedy and to solicit public comments pertaining to the remedial alternatives under Section 117(a) of CERCLA. The PP presented three alternatives, including the No Action Alternative.

Community members were invited to comment on the PP Report during the 30-day public comment period, which began on April 14, 2013 and concluded on May 14, 2013. No comments were received from the public.

There was no special effort to solicit the public's views about the future land use and the potential beneficial use of groundwater. It was clear from the alternatives presented in the PP that the HHRA did not consider residential use of the property and that the preferred remedy did not return groundwater to GA groundwater standards. The public commented on neither aspect. The public's view regarding land use can best be discerned from the Town of Niagara Local Redevelopment Authority selection of commercial/industrial use, approved by the Niagara Town Board, which was included in its Economic Development Conveyance Application submitted to the Office of Economic Adjustment and the Army Base Realignment and Closure Division. Selection of a non-residential use is particularly appropriate given the Site's airport location adjacent to taxiways, hangers, and runways.

This No Further Action ROD and the supporting Administrative Record files will be made available to the public when it is signed as final. The Administrative Record file will be available at the Niagara Falls Public Library, Earl W. Brydges Building, 1425 Main Street, Niagara Falls, NY, 14305.

2.4 SCOPE AND ROLE OF RESPONSE ACTION

Following the completion of several investigations and two remedial efforts to remove soil contaminated above the CSCOs, a Human Health Risk Assessment (HHRA) was performed to evaluate the remaining potential risks to human health from exposure to VOCs, SVOCs and PCBs in subsurface soils and groundwater under the reasonably anticipated land use. Prior to drafting the PP, the HHRA had calculated that a construction worker's total potential exposure to groundwater was slightly greater than the USEPA acceptable carcinogenic risk range of 1.0E-4 to 1.0E-6 provided that the worker engaged in an 8-hr per day excavation activity within the groundwater zone for a period of 180-days or longer. These exposure assumptions are highly conservative given the small size of the site. The HHRA revealed that there were no other unacceptable risks to commercial/industrial and construction workers. Risks to residents were not calculated because the property has no reasonably anticipated residential use.

Based on the above calculated risk to the construction worker, the preferred remedy in the PP was Implementation of a Site Management Plan (Alternative No. 2) requiring construction worker protection during excavation activities to achieve the remedial action objectives of reducing or eliminating inhalation of volatiles and dermal contact with groundwater.

Following receipt of public comments on the PP, a review of the HHRA revealed an error in the human health risk calculations. An incorrect Averaging Time of one year had been used. Correcting the Averaging Time to the EPA risk assessment guidance required 70 years resulted in no unacceptable risk to the construction worker. As a result, Army determined that the

remedial action objectives for the Site are achieved without further remedial action and selects Alternative No. 1, No Action as the remedy for the AOCs. The residual contamination from the releases of hazardous substances at the Site does not present an imminent or substantial endangerment to public health, welfare or the environment.

2.5 SITE CHARACTERISTICS

This section briefly summarizes the topography, geology, hydrogeology and nature and extent of contamination at the Site.

2.5.1 Overview

The Site is located on the US Geologic Survey (USGS) 7.5-minute Tonawanda West topographic map. Topography at the Site is relatively flat with a slight gradient to the west/southwest and the elevation is approximately 575 feet above mean sea level. A Site Location Map is included as Figure 1.

The Site is located within the Niagara Watershed. Surface and storm water drainage is to Cayuga Creek located immediately west of the Site. Cayuga Creek is an intermittent tributary of the Niagara River. A Site Plan is included as Figure 2.

The investigation and remediation activities addresses environmental impacts in the vicinity of a cast iron fire protection main, 500,000-gallon reservoir, 24-inch corrugated metal storm sewer line located on the eastern boundary and drainage swale south of the Site (Outfall No. 5). Investigation and remediation activities also addresses six former underground storage tanks (USTs) and former fueling area adjacent to former Building 2. The AOC locations are depicted in Figure 3.

2.5.2 Geology

The Site is located in the Erie-Ontario Lowlands Physiographic Province. The region is characterized by relatively flat topography and dissected by east-west trending escarpments. The Site is located about 5 miles south of the Niagara Escarpment (*Environmental Condition of Property Report*, CH2MHill, June 2007).

The Niagara Falls area is underlain by glacial sediment consisting mainly of till and lacustrine silt and clay, which is approximately 5 to 80 feet thick. The glacial deposits overlay weathered dolomite and limestone of the Lockport Group (Niagaran Series of Middle Silurian age). The Lockport Group is underlain by approximately 100 feet of shale and limestone (Clinton Group), which is underlain by 110 feet of sandstone and shale (Medina Group).

Soils encountered during the site inspection and remedial investigation consisted of non-cohesive fill from 0 to 4 feet below ground surface (bgs). Fill material at some probe locations extended from 8 to 13 feet bgs. The fill material encountered was comprised of a coarse-grained mixture of sand and gravel with varying amounts of fine-grained silt and clay. Varying amounts of brick, slag, concrete, rebar, asphalt and wood were observed within this matrix. Native surficial soils are comprised of silty clay with trace fine sand. Bedrock was not encountered during the investigation and probes were not advanced beyond 13 feet bgs.

2.5.3 Hydrogeology

The Site is underlain by the Lakemont silty clay loam and the Fonda mucky silt loam. Both soil types are fine-to moderately fine-textured and have a low permeability. These soils are subject to ponding and the water table in the vicinity of the Site is at a depth of less than 4 feet bgs (*Environmental Condition of Property Report*, CH2MHill, June 2007).

The glacial deposits at the Site act as a confining unit for the weathered bedrock below. The hydraulic properties in the Lockport dolomite and limestone are related to secondary porosity and permeability owing to the presence of factures and solutioning. The main water-bearing zones in the Lockport Group are the weathered bedrock surface and horizontal fracture zones near stratigraphic contacts. The rock matrix transmits negligible amounts of groundwater because primary porosity is very low. The horizontal hydraulic conductivity of the weathered bedrock is estimated at 40 feet per day.

Investigation of groundwater at the Site was limited to a perched water zone underlying the Site. The perched water zone was encountered at depths ranging from 2 to 6 feet bgs. It is likely that the coarse-grained fill material overlying the less-permeable native fine-grained clay is creating the perched water conditions at the Site.

2.5.4 Remedial Activities

In 2008, a yellow substance was observed discharging from the 24-inch diameter corrugated storm sewer at outfall (Outfall No. 5) into the drainage swale at the southeast corner of the Site (*See,* Figure 3). An investigation was performed by United States Army Reserve (USAR). Product was also observed discharging from a 6-inch diameter cast iron fire protection main into the 24-inch diameter corrugated storm sewer. A sample of the product was collected and analyzed. Polychlorinated biphenyls (PCBs) were detected in the sample at a concentration of 2.1 mg/kg (Aroclor 1254). NYSDEC was notified and Spill # 0803478 was assigned for the discharge.

2.5.4.1 Investigation/Remediation of Drainage Swale and Storm Sewer

An investigation of the outfall and drainage swale was performed between October 2008 and August 2009. Maps related to the investigation and remediation of the drainage swale and Outfall No. 5 are included as Figures 4 through 6. Aroclor 1254 was detected in the soil samples collected from the drainage swale at concentrations ranging from non-detect to 1,060 mg/kg. Additionally, Aroclor 1260 was detected in one soil sample at a concentration of 2.98 mg/kg. The findings of the investigation are outlined in the *Final Remedial Action Report* (PARS, March 2010).

In September 2009, approximately 134 tons of PCB impacted soils were excavated from the drainage swale. PCB concentrations in the post-excavation soil samples at Outfall No. 5 and from the drainage swale were below the maximum contaminant level of 1 milligram per kilogram (mg/kg) that was established by NYSDEC (*See*, Figures 5 & 6). The 24-inch diameter storm sewer was also cleaned as part of the remedial action. Investigation and remediation activities are outlined in the *Final Remedial Action Report* (PARS, March 2010).

2.5.4.2 Site Inspection

In November and December 2010, a site inspection was performed to evaluate potential impacts associated with the former USTs at former Building 2 and the fire protection main. Inspection activities consisted of a geophysical survey, exploratory excavations and soil and water sampling. Soil probe and test pit locations are shown on Figure 7. The geophysical survey identified an approximate 150-foot long linear anomaly in the vicinity of the fire protection main that terminates at the 24-inch diameter corrugated storm sewer line.

Twelve exploratory excavations were completed based on the findings of the geophysical survey. The 6-inch diameter cast iron fire protection water main was encountered in five exploratory excavations (TP-2, TP-3, TP-4, TP-11 and TP-12). At TP-11, the 6-inch diameter pipe terminated at a concrete catch basin presumed to be the 500,000-gallon reservoir drain. A sample was collected from the water flowing from the 6-inch diameter line into the concrete catch basin. Elevated concentrations of toluene, naphthalene, PCBs and chromium were detected in the water sample.

Petroleum product and a heavy sheen were observed within the fill material and on the groundwater surface in one of the exploratory excavations (TP-12). Several compounds, including PCBs, were detected in a water sample collected from TP-12 at concentrations exceeding the NYSDEC Class GA Objectives. A drum vacuum was used to remove petroleum impacted water from the excavation.

A soil sample was collected from one of the exploratory excavations (TP-1) and several semi-volatile organic compounds (SVOCs) were detected at concentrations exceeding the NYSDEC Unrestricted Use Soil Cleanup Objectives (USCO) and Commercial Use Soil Cleanup Objectives (CSCO).

Twenty-one soil probes were completed as part of the site inspection. One soil sample was collected from each probe for laboratory analysis. Acetone, metals and PCBs were detected in several samples at concentrations exceeding the USCO. Several metals were detected at concentrations exceeding the CSCO. NYSDEC concluded that fill material may be the cause of the elevated concentrations for certain metals in the soil, which should nullify any concerns for high metal content in the soils. The fill material contains some slag and iron blast slag and open hearth slag from the production of carbon steel is commonly found throughout western New York.

The findings of the Site Inspection are outlined in the *Final Site Inspection Report* (PARS, June 2011).

2.5.4.3 Remedial Investigation

In September 2011, a remedial investigation of soil and groundwater was performed in the vicinity of the six former USTs, the former vehicle fueling area and the cast iron fire protection main that discharges to a 24-inch corrugated metal storm sewer line on the eastern boundary of the Site. As part of this work, 30 soil probes (16 primary and 14 secondary) and nine boreholes were completed to collect soil samples and temporary open-hole 1-inch wells were installed in each borehole to collect groundwater samples. Sample locations are depicted in Figure 8.

Two soil samples were collected for laboratory analysis from each of the probes. Soil samples collected from the primary locations were submitted for target compound list (TCL) volatile organic compounds (VOCs), SVOCs and PCBs analysis. Secondary soil samples were analyzed at select locations based on the results of the primary samples.

Acetone was detected in soil sample SP-23-2-4 at a concentration of 60 micrograms per kilogram (µg/kg), slightly exceeding the USCO for the compound of 50 µg/kg. Acetone is a common laboratory contaminant and is not considered a contaminant of concern at the Site. All other detected VOCs were at concentrations below their respective USCO and CSCO.

Six SVOCs were detected at concentrations exceeding their respective USCO in soil sample SP-29-1-3. Benzo(a)pyrene was also detected at a concentration exceeding the CSCO in this sample. Benzo(b)fluoranthene was detected at a concentration exceeding the USCO in soil sample SP-37-1-3. SVOCs were not detected in any other samples at concentrations exceeding their respective USCO or CSCO.

Total PCB concentrations exceeding the USCO were identified in five samples (SP-28-1-3, SP-29-1-3, SP-30-1-3, SP-32-2-4 and SP-33-0-2). The concentration of PCBs detected at SP-28-1-3 also exceeded the CSCO of 1,000 µg/kg. PCBs were not detected in the remaining samples at concentrations exceeding the USCO or CSCO.

At the request of NYSDEC, a surface soil sample was collected at Outfall 4, immediately below the vegetative cover within the drainage swale along Porter Road. The sample was analyzed for TCL VOCs, TCL SVOCs and PCBs. Nine SVOCs were detected at concentrations exceeding the respective USCO and five SVOCs were detected at concentrations exceeding the respective CSCO. The SVOCs detected in the sample from the drainage swale are commonly found in ditches that receive storm water runoff from asphalt paved surfaces. Based on maps of the storm water drainage system, discharge to Outfall No. 4 is only from runoff from parking areas.

Total PCBs were detected in the outfall sample at a concentration of 210 µg/kg. This concentration exceeded the USCO for the compound of 100 µg/kg, but not the CSCO of 1,000 µg/kg, which was the cleanup objective established by NYSDEC for the previous remediation of the drainage swale.

On September 26 and 27, 2011, nine temporary well points were installed in the open probe-holes at SP-22, 25, 30, 32, 34, 36, 42, 46 and 49. Eight groundwater samples were collected and analyzed for TCL VOCs, SVOCs, and PCBs. Samples collected at SP-42 and SP-49 were not analyzed for SVOCs and PCBs due to insufficient groundwater recharge.

Benzene was detected in the groundwater sample at SP-49 and trichlorofluoromethane was detected in the groundwater sample at SP-22 at concentrations slightly exceeding the respective Class GA criteria. No other VOCs were detected in the groundwater samples at concentrations exceeding the respective Class GA criteria.

Four SVOCs were detected in the groundwater samples at concentrations exceeding the respective Class GA criteria at three locations (SP-22, SP-25 and SP-34). These compounds are benzo(a)anthracene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene.

Total PCBs were detected in groundwater samples from locations SP-30, SP-32 and SP-36 at concentrations exceeding the Class GA Criteria for the compound of 0.09 µg/L. PCB concentrations in these three samples were 0.77 µg/L (SP-30), 3 µg/L (SP-32), and 13 µg/L (SP-36). These exceedances are most likely the result of turbid water samples from the temporary well points. PCBs were not detected in the other groundwater samples at concentrations above the laboratory method detection limits.

The findings of the remedial investigation are outlined in the *Final Remedial Investigation/Interim Remedial Action/Human Health Risk Assessment Report* (PARS, December 2014).

2.5.4.4 Interim Remedial Action

An interim remedial action (IRA) was performed on September 29, 2011. The IRA included excavation of an approximately 10-foot (north-south) by 12-foot (east-west) area to a depth of approximately 5 feet bgs in the vicinity of the former exploratory excavation, TP-12. Excavation boundaries and confirmatory soil sample locations are depicted on Figure 9. Approximately 40 tons of soil was removed from the excavation and transported off-site for proper disposal.

During soil excavation activities, perched groundwater was observed at approximately two feet bgs. Perched groundwater exhibiting sheen was pumped from the excavation using a vacuum truck. Approximately 2,000-gallons of groundwater was removed from the excavation and transported off-site for proper disposal.

At the completion of soil removal activities, an approximate 8-foot long section of the 6-inch diameter cast iron fire protection main was removed from within the limits of the excavation. The open ends of the pipe were fitted with a Fernco and PVC cap prior to backfilling.

Five confirmatory soil samples were collected from the excavation. The confirmatory soil samples were analyzed for TCL VOCs, TCL SVOCs and PCBs. No compounds were detected in the confirmatory samples at concentrations exceeding the applicable USCOs and CSCOs.

The findings of the remedial investigation are outlined in the *Final Remedial Investigation/ Interim Remedial Action/Human Health Risk Assessment Report* (PARS, December 2014).

2.5.4.5 Supplemental Investigation

A supplemental investigation was performed in November 2012 to further evaluate the horizontal extent of groundwater impacts on the eastern portion of the Site. A total seven permanent monitoring wells and six temporary well points were installed as part of the investigation. Permanent and temporary wells locations and sample results are depicted in Figure 10. During drilling activities, soils were continuously logged and screened with a photoionization detector (PID). Based on PID readings, two soil samples were collected from the location of MW-5 and submitted the laboratory for TCL VOC, TCL SVOC and PCB analysis. No compounds were detected in the two soil samples at concentrations above the applicable USCO or CSCO.

Groundwater samples were collected from the six temporary well points on November 7 and 8, 2012 and from the seven permanent monitoring wells on November 19 and 20, 2012. Two of the permanent wells and one temporary well were dry. Groundwater samples were submitted to the laboratory for TCL VOC, TCL SVOC and PCB analysis. Benzene was detected in the perched

groundwater sample from TW-1 and tetrachloroethene (TCE) was detected in the sample from TW-5 at concentrations slightly above their respective Class GA criteria. TW-1 did not have a sand filter pack or bentonite seal. No other compounds were detected above the Class GA criteria.

The findings are outlined in the *Final Supplemental Investigation Report* (PARS, March 2013).

2.5.4.6 Human Health Risk Assessment

Based on the findings of the investigation and remediation activities, a HHRA was performed by for the Site. The objective of the HHRA was to evaluate potential risks to human health under current and reasonably anticipated land use. The risk assessment was completed in accordance with the regulations and guidelines set forth by the USEPA and the United States Army Corps of Engineers (USACE). Based on the HHRA it was determined that under current or future conditions, the commercial/industrial and construction worker exposures to the individual soil and groundwater pathways do not pose an unacceptable risk.

Residential use of the Site is not reasonably anticipated due to the close proximity to the airport taxiways, hangers, and runways. Therefore, residential was not considered as part of the risk assessment for potential exposure to soil and groundwater.

The findings of the risk assessment are outlined in the *Final Remedial Investigation/Interim Remedial Action/Human Health Risk Assessment Report* (PARS, December 2014).

2.6 CURRENT AND POTENTIAL FUTURE LAND USE

2.6.1 Land Use

The Site is currently vacant. There is a collection of buildings on the property, including a former Army reserve center, various buildings and shops, and a large aircraft hanger that includes service areas. The property is almost completely paved. The Site will be transferred to the Town of Niagara for commercial/industrial use through an Economic Development Conveyance. The intended future land uses within the site addressed by this ROD include a paved parking lot and commercial building.

There is no reasonably anticipated residential use of the Site due to its locations between the ends of Runway 6 and Runway 10R. The property itself is bounded by airport hangers and taxiways to the north and east, Porter Road to the south, and woods and retail commercial property to the west. The area of the property addressed by this ROD is nearly or partly within the Runway Safety Area of Runway 6.

The immediate area surrounding the Site is zoned by the Town of Niagara as Light Industrial and following conveyance the Site will be subject to local codes including the *Town of Niagara Zoning Ordinance*.[1] The draft airport master plan concludes that non-compatible residential structures, a mobile home park, and a hotel already exist in the vicinity of Runways 6 and 10R on the opposite side of Porter Road.[2] There is no basis to conclude that the zoning authority would allow the residential use of property in the vicinity of Runways 6 and 10R that is located

[1] MRB Group, *U.S. Army Reserve Center Redevelopment Plan*, 11 (February 2008).
[2] McFarland Johnson, *Draft Sustainable Airport Master Plan*, 3-16 (2014).

on the same side of Porter Road as the runways that conflicts with the existing zoning. Based on the Site location and Army BRAC policy when transferring commercial property under an Economic Development Conveyance, a restriction prohibiting residential use will be included in the deed transferring the property.

2.6.2 Groundwater Use

The shallow perched groundwater is not used for drinking water. Because the property is within the service area of the Niagara Falls Water Board, there is no future potable groundwater use. Additionally, the shallow nature, low production, and the groundwater's location adjacent to an airport make its use more than inadvisable. It is unlikely that an attempt to use the shallow groundwater could meet the location and construction standards for a groundwater well permit set forth in Subpart 5-2 and Appendix 5B of Title 10 of the Rules and Regulations of the State of New York. These regulations would also require that Niagara County Health Department grant a shallow well variance because the well would be shallower than 19 feet. A restriction prohibiting groundwater use will be included in the deed transferring the property.

2.7 SUMMARY OF SITE RISKS

The risk assessment estimates what potential risks that the AOCs pose if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed. This section summarizes the results of the HHRA for the AOCs.

2.7.1 Human Health Risk Assessment

An HHRA was performed to evaluate potential current and future risks associated with detected constituents in subsurface soil and groundwater at the AOC. The HHRA was performed for VOCs, SVOCs and PCBs in subsurface soils and groundwater in accordance with CERCLA, NCP and applicable USEPA guidance. A detailed discussion of the HHRA is presented in the *Final Remedial Investigation/Interim Remedial Action/Human Health Risk Assessment Report* (PARS, December 2014).

2.7.1.1 Identification of Chemicals of Potential Concern

Site-related chemicals selected for quantitative evaluation were defined as Chemicals of Potential Concern (CPCs). CPCs were identified based on analytical results collected as part of remedial investigation and remedial action activities.

Compounds in soil detected at concentrations above the NYSDEC USCO and compounds in groundwater detected above the NYSDEC Class GA criteria were selected as part of the initial screening process. SVOCs detected in the surface soil sample at Outfall No. 4 were not evaluated as part of the risk assessment because these compounds are not suspected to be from a point source release from the Site. The SVOCs detected in the sample at Outfall No. 4 are commonly found in ditches/drainage swales that receive storm water runoff from asphalt paved surfaces. The NYSDEC agreed that SVOCs were not associated with a discharge from the Site and were likely related to runoff. PCBs were detected in this sample at a concentration that exceeds the USCO for the compound of 100 µg/kg. Therefore, the surface soil sample at Outfall No 4. was evaluated for PCBs as part of the risk assessment.

All compounds selected as part of the initial screening process were carried into the secondary screening process. Evaluation of compounds for the secondary screening process is based on the guidelines set forth in the USEPA *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (RAGS).*

The 95% upper concentration limit (UCL) was calculated using updated PRO UCL 5.0.00 Software developed by Lockheed Martin and the USEPA (*Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites).* If the UCL could not be calculated because of an insufficient number of detections, the maximum detected concentration for the compound was used in the risk assessment. Based on the distribution of statistical data for some of the groundwater and subsurface soil samples, the Pro UCL Software recommended using the 97.5% UCL, which yields a more conservative assessment.

The 95% or 97.5% UCL was used as the exposure point concentration (EPC) for each compound. The EPC is an estimate of the mean concentration of a compound found in a specific medium at an exposure point. The maximum detected concentration for each compound identified as part of the initial screening process was compared to the respective Regional Screening Level (RSL) presented in the USEPA RSL Tables. Groundwater samples were compared to the RSL Tapwater Supporting Table and the surface soil sample was compared to the RSL Residential Table. Subsurface soil samples were compared to the RSL Industrial Soil Table based on the anticipated future use of the Site for commercial/industrial purposes.

Based on the secondary screening, PCBs (Aroclor 1260) in surface soil at Outfall No. 4 was not considered a CPC at the Site. Subsurface soil and groundwater CPCs identified as part of the secondary screening process are shown in the following exhibits.

Exhibit 1 - Subsurface Soil CPC Selection

Analyte	CAS Number	Frequency of Detection	Mean of Detected (mg/kg)	Range of Detected (mg/kg)	95% UCL (mg/kg)	Max. Detect (mg/kg)	EPC (mg/kg)	RSL (mg/kg)
Benzo(a)anthracene	56-55-3	44/66	0.629	0.0089-10	1.55[b]	10.0	1.55	2.9
Dibenzo(a,h)anthracene	53-70-3	15/66	0.296	0.01-2.3	0.247[c]	2.3	0.247	0.29
Benzo(b)fluoranthene	205-99-2	49/66	0.719	0.0048-14.0	2.024[b]	14.0	2.024	2.9
Benzo(a)pyrene	50-32-8	44/66	0.738	0.007-14.0	1.963[b]	14.0	1.963	0.29
Indeno(1,2,3-cd)pyrene	193-39-5	38/66	0.423	0.0062-8.8	1.113[b]	8.80	1.113	2.9
Aroclor 1254	11097-69-1	27/83	2.313	0.007-18.0	2.793[b]	18.0	2.793	1.0
Aroclor 1260	11096-82-5	15/83	0.473	0.025-1.6	0.14[a]	1.60	0.14	1.0

Notes:

mg/kg - Milligrams per Kilogram

UCL- Upper Concentration Limit

EPC - Exposure Point Concentration

RSL - Risk Based Concentration (USEPA Regional Screening Level (RSL) Tables for Industrial Soil, May 2014)

a- Calculated using the 95% KM (Percentile Bootstrap) Method

b- Calculated using the 97.5% KM (Chebyshev) Method

c- Calculated using the 95% KM (Chebyshev) Method

Exhibit 2 - Groundwater CPC Selection

Analyte	CAS Number	Frequency of Detection	Mean of Detected (µg/L)	Range of Detected (µg/L)	95% UCL (µg/L)	Max. Detect (µg/L)	EPC (µg/L)	RSL (µg/L)
Benzene	71-43-2	3/19	1.237	0.51-1.6	NC	1.6	1.6	0.45
Benzo(a)anthracene	56-55-3	3/17	0.593	0.44-0.85	NC	0.85	0.85	0.034
Benzo(b)fluoranthene	205-99-2	1/17	NA	NA	NC	1.1	1.1	0.034
Indeno(1,2,3-cd)pyrene	193-39-5	1/17	NA	NA	NC	0.91	0.91	0.034
Trichloroethene	79-01-6	2/19	4.19	0.58-7.8	NC	7.8	7.8	0.49
Aroclor 1254	11097-69-1	1/17	NA	NA	NC	2.0	2.0	0.039
Aroclor 1260	11096-82-5	3/17	4.923	0.77-13.0	NC	13.0	13.0	0.039

Notes:

µg/L - Micrograms per liter

UCL- Upper Concentration Limit

EPC - Exposure Point Concentration

RSL - Regional Screening Level (USEPA Regional Screening Level (RSL) Tables for Tap Water, May 2014)

CPC - Contaminant of Potential Concern

NA- Not enough detected data available

NC- Not calculated because there are not enough detected values to compute meaningful or reliable statistics and estimates.

2.7.1.2 Exposure Assessment

An exposure assessment was conducted to identify the potential for human contact to compounds detected in soil and groundwater at the Site. Current land use and future planned land use conditions were examined to evaluate potential exposures.

The proposed future reuse within the AOCs includes a paved parking lot and commercial building. There is no reasonably anticipated use of the Site for residential purposes due to restrictions and use limitations imposed by its location adjacent to airport taxiways, hangers, and runways. Therefore, residential use was not considered as part of the risk assessment for potential exposure to soils and groundwater.

After examining current and reasonably anticipated uses of the Site, contaminated media, and the nature of the contaminants, six exposure pathways for the construction worker and industrial/commercial worker were evaluated. These exposures are:

- dermal exposure to subsurface soil and groundwater;
- inhalation of subsurface soil particulates and groundwater; and
- ingestion of subsurface soil and groundwater.

Exhibit 3 summarizes these exposure pathways.

Exhibit 3 – Summary of Potential Exposure Pathways

Potentially Exposed Population	Exposure Route, Medium, Exposure Point	Pathway Selected for Evaluation	Reason for Selection
Child Trespasser	Dermal exposure to surface soil; ingestion of surface soil	No	There were no compounds of potential concern identified above the screening levels, therefore the pathway could not be completed.
Construction Worker	Dermal exposure to subsurface soil	Yes	Future use of the Site is industrial/commercial, therefore the potential exists for future construction workers to come in contact with soil during excavation or construction activities.
Construction Worker	Inhalation of subsurface soil particulates	Yes	Future use of the Site is industrial/commercial, therefore the potential for land disturbance could cause future construction workers to come in contact with soil particulates.
Construction Worker	Incidental ingestion of subsurface soil	Yes	Future use of the Site is industrial/commercial, therefore the potential exists for future construction workers to come in contact with soil during excavation or construction activities.
Construction Worker	Incidental Ingestion of groundwater	Yes	Future use of the Site is industrial/commercial, therefore the potential exists for future construction workers to come in contact with groundwater during excavation or construction activities.
Construction Worker	Inhalation of exposed groundwater	Yes	Future use of the Site is industrial/commercial, therefore the potential exists for future construction workers to be exposed to volatiles from groundwater during construction activities.
Construction Worker	Dermal exposure to groundwater	Yes	Future use of the Site is industrial/commercial, therefore the potential exists for future construction workers to come in contact with the groundwater during construction activities at the Site.
Commercial/Industrial Worker	Dermal exposure to subsurface soil	Yes	Future use of the Site is industrial/commercial, therefore the potential exists for future commercial/industrial workers to come in contact with soil during landscaping activities.

Potentially Exposed Population	Exposure Route, Medium, Exposure Point	Pathway Selected for Evaluation	Reason for Selection
Commercial/Industrial Worker	Inhalation of subsurface soil particulates	Yes	Future use of the Site is industrial/commercial, therefore the potential for land disturbance could cause future commercial/industrial workers to come in contact with soil particulates.
Commercial/Industrial Worker	Incidental ingestion of subsurface soil	Yes	Future use of the Site is industrial/commercial, therefore the potential exists for future commercial/industrial workers to come in contact with soil during landscaping activities.
Commercial/Industrial Worker	Accidental Ingestion of groundwater	No	The future commercial/industrial worker would not come in contact with groundwater at the Site during trenching activities. Therefore this pathway is incomplete.
Commercial/Industrial Worker	Inhalation of exposed groundwater	No	The future commercial/industrial worker would not come in contact with groundwater at the Site during trenching activities. Therefore this pathway is incomplete.
Commercial/Industrial Worker	Dermal exposure to groundwater	No	The future commercial/industrial worker would not come in contact with groundwater at the Site during trenching activities. Therefore this pathway is incomplete.

The construction worker exposure scenario was examined for all pathways. Because exposure to groundwater results in a risk an order of magnitude greater than exposure to soil, the relevant exposure scenario is the construction worker excavating deeper than one foot below ground surface into the saturated soil zone. The industrial/commercial worker exposure scenario was examined for exposure to subsurface soil via dermal exposure, inhalation of particulates and incidental ingestion. The industrial/commercial worker would not be exposed to groundwater. The highest probable exposure to subsurface soil would be to a landscaper/groundskeeper who is planting or tilling.

The degree of exposure was evaluated by determining the contaminant concentrations that the population may be exposed, as well as the duration of the exposure and exposure pathways. Based on USEPA risk assessment guidance, exposures were quantified by estimating the Reasonable Maximum Exposure (RME) associated with each pathway of concern. The RME is the maximum chemical intake that is reasonably expected to occur at a site under both current and future land-use conditions. The RME for a given pathway is derived by combining the exposure point concentration for each chemical with standard intake factors and reasonable maximum values for assumed frequency and duration of the activity resulting in the exposure (USEPA, 1989b). The RME is intended to place a conservative upper-bound limit on the potential risk. Details regarding the intake calculations are included in the *Final Remedial Investigation/Interim Remedial Action/Human Health Risk Assessment Report* (PARS, December 2014).

It is noted here that the initial calculations for the exposure assessment to cancer-causing chemicals used an incorrect Averaging Time of one year instead of the 70 years required by EPA risk assessment guidance. A review of the HHRA following receipt of public comments on the

Proposed Plan revealed an error in the calculations. As discussed below, the use of the correct 70-year Averaging Time in the subsequent risk calculations resulted in no unacceptable risk to the construction worker.

2.7.1.3 Toxicity Assessment

The toxicity assessment defined the relationship between the dose of a compound and the probability that a carcinogenic or non-carcinogenic effect will occur. The toxicity assessment is divided into two parts: hazard identification and dose-response evaluation. As stated in RAGS, hazard identification is the process of determining whether exposure to a compound will cause an increase in the incidence of a particular adverse health effect and whether the health effect is likely to occur in humans. The dose-response evaluation quantifies the toxicological information and characterizes the relationship between the dose of a compound and the incidence of adverse health effects in a population. Toxicity values are expressed as reference doses (RfD) for oral non-carcinogenic effects and slope factors for carcinogenic effects.

Each compound was classified by its degree of carcinogenic properties. This information was obtained from the USEPA Integrated Risk Information System (IRIS). All subsurface soil compounds identified in this risk assessment were rated as B2 by the USEPA classification system. Therefore all toxicity values were evaluated as carcinogens. Although Aroclor 1254 is rated as a B2 carcinogen, risk characterization data exists for non-cancer risk to dermal exposure. Therefore, Aroclor 1254 was examined for carcinogenic and non-carcinogenic risk to dermal exposure.

The hierarchy of sources for identifying dose-response values was followed using the guidelines set forth in Memorandum: *Human Health Toxicity Values in Superfund Risk Assessments* which replaces the guidelines of RAGS Part A. The USEPA IRIS database was first consulted for all compounds. For compounds not available through IRIS, the USEPA Provisional Peer Reviewed Toxicity Values (PPRTVs) and California EPA values (CALEPA) were consulted.

Using the recommended equations for each pathway, the absorbed dose for each CPC was calculated for all carcinogens and non-carcinogens. The slope factor for each compound was obtained from the RSL Tables. The slope factor was adjusted for all dermal routes of exposure to represent the absorbed amount and not the administered. In accordance with RAGS Part E, Exhibit 4-1, toxicity factors for PCBs and SVOCs were not adjusted for exposure to groundwater. Therefore, only benzene and trichloroethene required adjustment. The slope factors for benzene and trichloroethene were divided by the oral absorbed efficiency value, which was obtained from the RSL tables.

2.7.1.4 Risk Characterization

The corrected exposure assessment and the toxicity assessment are integrated to develop both the quantitative and qualitative risk evaluations. The average daily intakes calculated as part of the exposure assessment were combined with the dose-response values from the toxicity assessment.

All compounds with potential carcinogenic effects were evaluated based on guidance from the USEPA RAGs. An individual upper-bound excess lifetime cancer risk was calculated by multiplying the calculated estimated daily intake by the appropriate carcinogenic slope factor (CSF) for each compound. The total lifetime cancer risk for simultaneous exposure to all chemicals within a pathway was calculated using the summation of each individual chemical.

Non-carcinogens were evaluated based on guidance from the USEPA RAGS. A non-cancer hazard quotient was calculated by dividing the calculated exposure intake by the appropriate reference dose for each compound.

The calculated risks for carcinogenic and non-carcinogenic exposures are summarized in the Exhibits 4 and 5.

Based on the subsurface soil and groundwater data, no unacceptable non-carcinogenic or carcinogenic risks were identified under existing or future conditions. The total cancer risks were within the acceptable ranges set by the USEPA from 1×10^{-4} to 1×10^{-6}. Total non-carcinogenic risks were significantly lower than the acceptable hazard quotient of 1.

Exhibit 4 – Risk Characterization Carcinogenic Summary

Media	Population	Cancer Risk	Principal Contributing Pathway
Subsurface Soil	Commercial/Industrial Worker	3.24E-05	Dermal contact
Subsurface Soil	Commercial/Industrial Worker	3.11E-09	Inhalation
Subsurface Soil	Commercial/Industrial Worker	7.77E-06	Ingestion
Total Subsurface Soil Risk- Commercial/Industrial Worker		**4.02E-05**	
Subsurface Soil	Construction Worker	2.33E-06	Dermal contact
Subsurface Soil	Construction Worker	8.95E-11	Inhalation
Subsurface Soil	Construction Worker	7.38E-07	Ingestion
Total Subsurface Soil Risk- Construction Worker		**3.07E-06**	
Groundwater	Construction Worker	1.53E-05	Dermal contact
Groundwater	Construction Worker	8.19E-07	Inhalation
Groundwater	Construction Worker	5.73E-08	Ingestion
Total Groundwater Risk- Construction Worker		**1.62E-05**	

Exhibit 5 – Risk Characterization Non-Carcinogenic Summary

Media	Population	Non Cancer Risk	Principal Contributing Pathway
Subsurface Soil	Commercial/Industrial Worker	1.78E-01	Dermal contact
Total Subsurface Soil Risk- Commercial/Industrial Worker		**1.78E-01**	
Subsurface Soil	Construction Worker	1.28E-02	Dermal contact
Total Subsurface Soil Risk- Construction Worker		**1.28E-02**	
Groundwater	Construction Worker	5.45E-02	Dermal contact
Total Groundwater Risk- Construction Worker		**5.45E-02**	

2.7.1.5 Uncertainty

The interpretation of risk estimates is subject to a number of uncertainties as a result of conservative assumptions inherent in risk assessments. Quantitative human health risk estimates are based on numerous conservative assumptions. These conservative estimates lead to uncertainty in exposure and toxicity. Major sources of uncertainty and their potential effects are detailed in Exhibit 6.

Exhibit 6 - Sources of Uncertainty

Uncertainty	Effect	Justification
Exposure point concentration	Overestimate	The 95% UCL was calculated for each compound at the Site and used as the EPC in the risk assessment calculations. In addition, for sub surface soil, the 97.5% UCL yielded an even more conservative estimates than the 95% UCL
Exposure assumptions (frequency, duration, time)	Overestimate	Parameters selected are conservative estimates of exposure. This is true for the construction worker exposure. The impacted area is approximately one acre of the 19.5 acre Site, and the construction worker was calculated as spending 180 days working at the site. This yields a conservative estimate to the total amount of risk.
Exposure assumptions (frequency, duration, time)	Overestimate	Parameters selected are conservative estimates of exposure. This is true for the commercial/industrial worker exposure. The impacted area is approximately one acre of the 19.5 acre Site, and the commercial/industrial worker was calculated as spending 250days working at the site. This yields a conservative estimate to the total amount of risk.
Extrapolation of animal toxicity data to humans	Unknown	Animal studies typically involve high dose exposures, while humans are exposed to low doses in the environment

Uncertainty	Effect	Justification
Industrial RSL are not available for groundwater	Overestimate	Tap water groundwater screening levels are used in the risk assessment, since industrial groundwater levels are not available. This makes the exposure estimates much more conservative.
Dermal Doses	Unknown	Dermal cancer slope factors and reference doses were not listed in the USEPA RSL Tables or the IRIS database. To obtain the correct dermal doses, the ingestion values were converted following guidelines presented in RAGS Part A.
Fraction Ingested (FI)	Overestimate	The fraction of soil ingested from a contaminated source was assumed to be 100%. This is a conservative estimate of risk to the construction worker.

Exposure factors at the Site were selected in accordance with the RAGS guidelines, the USEPA Exposure Factors Handbook and the USEPA Supplemental Guidance: Update of Standard Default Exposure Factors (OSWER Directive 9200.1-120). This guidance recommends a default exposure frequency for a commercial/industrial worker of 250 days and for a construction worker of 180 days.

A groundskeeper is most likely to have the greatest degree of exposure of any commercial/ industrial worker at the Site, since subsurface soil is the only expected pathway for a commercial/industrial worker. It is unlikely that the groundskeeper would spend 250 days per year constantly exposed to subsurface soils. Most grounds keeping activities (mowing, planting, tilling etc.) do not require continuous digging or subsurface exposure. Additionally, during the late fall and winter, weather conditions are not conducive to planting and lawn care. The 250 days of exposure per year assumption is overly conservative and overestimates the risk to the commercial/industrial worker. Similarly, the exposure scenario resulting in the highest exposure was excavating an 8-foot deep utility trench. Because of the small size of the AOCs, the standard 180-day duration assumption is overly conservative and overestimates the risk to the commercial/industrial worker.

2.7.1.6 Conclusion

Under current or future conditions and based on the quantitative and qualitative analysis of the risk assessment, the commercial/industrial and construction worker exposure pathways at the Site do not pose an unacceptable risk. Residential use of the Site is not reasonably anticipated due to the close proximity to the airport taxiways, hangers, and runways. Restrictions prohibiting residential use and groundwater use will be included in the deed transferring the Site.

2.7.2 Ecological Risk Assessment

No ecological risk assessment was conducted at the Niagara Falls Armed Forces Reserve Center due to the lack of habitat.

2.8 REMEDIAL ACTION OBJECTIVES

Remedial measures for the Site must satisfy Remedial Action Objectives (RAOs) in accordance with the NYSDEC Technical Guidance for Site Investigation and Remediation and Section 40 CFR 300.430 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The RAOs are statements that convey the goals for minimizing or eliminating substantial risks to

public health and the environment. RAOs were developed to protect human health and the environment based on the conclusions of the HHRA. The RAOs for the Site are as follows:

Groundwater

- Reduce or eliminate inhalation of volatiles from exposed contaminated groundwater during subsurface construction activities.
- Reduce or eliminate dermal contact with groundwater that may occur during construction activities

2.9 DESCRIPTION OF ALTERNATIVES

Prior to drafting the PP, the HHRA had calculated that a construction worker's total potential exposure to groundwater was slightly greater than the USEPA acceptable carcinogenic risk range of 1.0E-4 to 1.0E-6 provided that the worker engaged in an excavation activity within the groundwater zone, but that there were no other unacceptable risks to commercial/industrial and construction workers. Based on this single risk to the construction worker, the Preferred Remedy in the PP was Implementation of a Site Management Plan (Alternative No. 2) requiring construction worker protection during excavation activities to achieve the remedial action objectives of reducing or eliminating inhalation of volatiles and dermal contact with groundwater.

Following receipt of public comments on the Proposed Plan, a review of the HHRA revealed an error in the human health risk calculations. An incorrect Averaging Time of one year had been used. Correcting the Averaging Time to the EPA risk assessment guidance required 70 years resulted in no unacceptable risk to the construction worker. Army compared the No Action Alternative to the Preferred Alternative, and determined that these were the same in every way except for the Site Implementation Plan. Because the Site Management Plan is no longer needed for the protection of human health, Army determined that both the No Action Alternative and the Preferred Alternative offered equivalent levels of protection and were equally effective in achieving the RAOs and ARARs for the Site. Army chooses No Further Action as the Selected Remedy because it imposes a lower degree of burden on future development while achieving an equivalent level of protection of human health and the environment. (Because removal actions have occurred at the AOCs, the correct term for Alternative No. 1 is "No Further Action." This is the term used for the Selected Remedy in this ROD.)

2.9.1 Description of Remedy Components

Although the Site will not be used for residential purposes, evaluating a remedy that achieves an unrestricted use is required. DER-10 guidance also requires the evaluation of a "no-action" alterative to provide a baseline for comparison against other alternatives. Since an IRA has been completed for the Site, the following alternatives were evaluated.

- No Further Action (Alternative No. 1): Under this alternative, the Site would remain in its current state, with no additional controls in-place.
- Implementation of a Site Management Plan (Alternative No. 2): Under this alternative, a Site Management Plan would be developed to address contaminated groundwater remaining at the Site in the event subsurface activities were performed (i.e., site upgrades, utility repair, new construction, etc.).

- Unrestricted Use Cleanup (Alternative No. 3): Under this alternative, it would be necessary to remediate soil and fill material where concentrations exceed the USCOs. For unrestricted use scenarios, excavation and off-Site disposal of impacted soil and fill is generally regarded as the most applicable remedial measure. This alternative assumes that those non-building areas which exceed USCOs would be excavated and disposed at an approved off-Site landfill. During the excavations, groundwater encountered would also be captured, stored and disposed of off-Site (assumed disposal into the City of Niagara Falls sanitary sewer system). Based on the Site analytical data from this and previous investigations, it is estimated that an approximate 20,500 square foot area or 3,034 cubic yards of soil would be excavated and 92,000 gallons of perched groundwater would be pumped from the excavations. The soil and groundwater would be disposed of off-site.

2.9.2 Common Elements and Distinguishing Features of Each Alternative

The common elements among the Proposed Plan alternatives are: (1) no Alternative includes land use controls to prevent future residential use of the property or to prevent the use of groundwater; (2) no Alternative includes a component directly addressing the sporadic, small exceedance of the GA groundwater standards, although Alternative No. 3 will remove groundwater within the excavated soil and that flows into the excavation while open; and (3) because Alternatives Nos. 1 and 2, as well as perhaps Alternative No. 3, will leave residual groundwater and/or soil contamination above unlimited use and unrestricted exposure standards, five-year reviews will be required pursuant to CERCLA § 121(c).

The distinguishing feature of Alternative 3 is that it would remove all soil with chemical concentrations exceeding USCO standards. Alternatives Nos. 1 and 2 do not remove any soil. Alternative No. 2 leaves the soil exceeding the USCO, in place but includes a site management plan that would include the use of personal protection equipment or other engineering approaches to protect construction workers from chemicals in excavations that extend into the groundwater. Alternative No. 3 does not include a site management plan. Alternative No. 1 is the no further action alternative and so contains neither of these features. It leaves soil exceeding the USCO in place and, like Alternative No. 2, does not address the groundwater above GA standards.

2.9.3 Expected Outcomes of Each Alternative

Based on the corrected HHRA demonstrating that groundwater does not pose an unacceptable risk to Site workers, all of the Alternatives achieve all RAOs. Alternative 2 was designed to address exposure to construction workers conducting excavations within the AOCs. Correction of the exposure calculations, however, revealed that neither the site management plan nor the excavation of soil exceeding USCO standards was necessary to achieve an acceptable level of protection for Site workers. Therefore Alternative 2 is not distinguishable from Alternatives Nos. 1 and 3 with respect to achieving the remedial action objectives.

In addition, implementation of Alternative No. 3 would allow residential use of the property. However, residential use of the property is not possible due to its location adjacent to airport hangers and taxiways and between two airport runways, zoning, and the intended reuse that is consistent with these realities. Because the soil exceeding the CSCO standards was removed during prior remedial actions, Alternatives Nos. 1 and 2 allow the property to be used for all reasonably anticipated uses, which uses do not include residential.

None of the Alternatives directly address the slight and scattered exceedance of the GA groundwater standards. It is unlikely that the groundwater produces adequate flow for drinking water purposes. The bedrock that occurs at depths ranging between 13 and 16 feet is overlain by 11 to 16 feet of silty clay, which has a very low permeability expected to be in the range of 1x10-5 to 1 x 10-7 cm/s and is not expected to produce sufficient amounts of water. On top of the silty clay to the surface is 0 to 4 feet of sandy fill. Twenty percent of the wells failed to produce any groundwater, and another ten percent failed to produce enough for a complete sample.

The Site is served by the public water utility and the perched groundwater's shallow nature, low production, and location adjacent to an airport make its use more than inadvisable. It is unlikely that an attempt to use the shallow groundwater could meet the location and construction standards for a permit that are set forth Subpart 5-2 and Appendix 5B of Title 10 of the Rules and Regulations of the State of New York, which would also require that Niagara County Health Department grant a shallow well variance because the well would be shallower than 19 feet.

2.10 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

Below is a summary of the evaluation of the three alternatives remedy using the nine criteria in accordance with section 40 CFR 300.430 (e) (9) of the National Contingency Plan (NCP). A comparative analysis of each alternative is not included in the revised *Remedial Investigation/ Interim Remedial Action Report and Human Health Risk Assessment* issued in December 2014 because there was no unacceptable risk following correction of the exposure assessment calculations. The evaluation below is modified from the Proposed Plan to be consistent with the revised HHRA.

2.10.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

Because the revised HHRA determined that there are no unacceptable risks for current and reasonably anticipated uses of the Site, all Alternatives are protective of human health and the environment. Although the alternative will not meet the chemical SCGs, Alternatives Nos. 1 and 2 are considered adequate remedies for human health with respect to the risk of exposure. Alternative No. 3 involves the removal of the contaminated soil and groundwater within the excavation area, and would be the most protective of human health and the environment.

2.10.2 Compliance with ARARs

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4).

Alternative No. 3 is expected to achieve compliance with the chemical-specific soil USCOs and GA groundwater standards within the excavation area. Alternatives Nos. 1 and 2 achieve the CSCO standard but are not expected to meet the USCOs and GA groundwater standards. There is no reasonably anticipated use of the property that requires attainment of the USCOs and the perched groundwater at the site is not useable for drinking water purposes.

2.10.3 Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

All Alternatives are considered to maintain reliable protection of human health over time because there are no current residual risks that are considered to be unacceptable for the reasonably anticipated uses of the Site.

2.10.4 Reduction of Toxicity, Mobility and Volume Through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

Alternative No. 3 provides for the greatest reduction of toxicity, mobility and volume of soil and groundwater contamination within the excavation, as the majority of the soil contamination would be removed and disposed off-site. To the extent that groundwater is contained in the soil matrix or flows into the excavation, groundwater will also be removed. Alternatives Nos. 1 and 2 will not reduce the toxicity, mobility and volume of the contamination.

2.10.5 Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Alternative No. 3 involves excavation work, which could possibly cause exposure to contaminated soil and groundwater during remediation. Workers, particularly those in personal protective equipment, will be subject to the risk of injury resulting from equipment operations. The excavated soil will be transported in 200 to 250 semi trucks that will travel public roads to the selected landfill and approximately 30 vacuum trucks will transport collected groundwater on public roads to the sewage treatment plant. The risk to the public posed by these transportation requirements would be real but minimal in comparison to the risks posed by existing traffic.

2.10.6 Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Alternatives No. 1 and 2 are technically and administratively implementable and require no field implementation initially. If a site management plan that includes placing workers in Level C personal protective equipment were to be implemented, the complexity and the resources required to conduct simple excavations and utility installation within those excavations would be greatly increased, as would the physical risk to workers working in conjunction with machinery in a confined space such as a trench. As previously discussed, however, there is no need for worker protection from the Site chemicals. Alternative No. 3 will require significant equipment, materials and services, though the work processes involved are standard and there should be no implementability issues.

2.10.7 Cost

Alternative No. 1, which involves taking no further action, has the lowest capital and O&M cost as there will be no additional remedial activities completed. Alternative No. 2, which is the implementation of a SMP, has the second highest capital cost of approximately $13,200. O&M costs would associated with Alternative No. 2 include annual inspection and report preparation which are approximately $3,360. Alternative No. 3, which removes soil exceeding the USCO has the highest capital cost which is estimated at approximately $335,800. There is no long term O&M cost associated with Alternative No. 3.

2.10.8 State Acceptance

Prior to the correction of the HHRA, NYSDEC concurred in the selection of Alternative No. 2 as the Preferred Remedy provided that the United States placed a restriction in the deed that prohibits residential use. The deed will prohibit both residential use and groundwater use.

The NYSDEC concurs with the selection of No Further Action, as the Selected Remedy. Following revision of the HHRA to correctly calculate the estimated exposure to the construction worker, there is no difference in the protectiveness of the Alternatives Nos. 1 and 2, or the need for a Site Management Plan.

2.10.9 Community Acceptance

The US Army issued the PP Report to the community as part of its public participation responsibilities to inform the public of the US Army's preferred remedy and to solicit public comments pertaining to the remedial alternatives under Section 117(a) of CERCLA. Community members were invited to comment during the 30-day public comment period, which began on April 14, 2013 and concluded on May 14, 2013. No comments were received. It is therefore not determinable what alternative may or may not have been supported by the community.

2.10.10 Summary

Alternative No. 1 (No Further Action) achieves the RAOs and soil ARARs and is protective of commercial/industrial workers, construction workers and other foreseeable users of the Site. This alternative is considered to be protective of human health and the environment. No technical or administrative implementability issues are associated with this alternative and there would be no capital or long-term O&M costs. This alternative is not expected to meet the chemical-specific ARARs for the identified groundwater contamination. This alternative achieves adequate protection of human health at the lowest cost and is most easily implementable. There are no short-term or long-term effectiveness issues. This is the lowest cost alternative.

Alternative No. 2 (Implementation of a Site Management Plan) was presented in the PP as the Preferred Alternative because it achieves the RAOs and soil ARARs and was indicated for controlling the risk to construction workers conducting excavations. This alternative is considered to be protective of human health and the environment. Implementation of this alternative would result in reducing the potential exposure to contaminants during construction or excavation activities. This alternative is not expected to meet the chemical-specific ARARs for the identified groundwater contamination. This alternative is implementable on a technical basis. There are no short-term or long-term effectiveness issues.

Alternative No. 3 (Unrestricted Use Cleanup) achieves the RAOs and soil ARARs, plus removes all soil with chemical concentrations greater than the USCOs. Additionally, there is significant capital cost associated with the alternative and approvals are required for off-site disposal of soil and groundwater. This alternative is considered to be protective of human health and the environment. The RAOs for groundwater can be met; however, additional protective measures will need to be taken to limit the worker's exposure to groundwater during excavation activities. Furthermore, this alternative was not selected because potential exposure is limited to only the construction worker and contaminant levels are only slightly above the chemical-specific ARARs. There are no significant short-term or long-term effectiveness issues. This is the highest cost alternative.

2.11 PRINCIPAL THREAT WASTES

There is no Principal Threat Waste remaining on the AOCs. The pipes and culverts containing the yellow liquid, and the soil, leachate, and sediment that may have been classified as a principal threat waste were removed during the 2010 and 2011 remedial activities.

2.12 SELECTED REMEDY

The Selected Remedy is Alternative No. 1, No Further Action.

2.12.1 Summary of the Rationale for the Selected Remedy

The No Further Action Alternative is selected because it meets all of the RAOs in a manner that will be the least burdensome to the future property owners. Following correction of the exposure calculations, the revised HHRA concluded that the chemicals found at the AOCs did not pose an unacceptable risk to Site workers. Based on that determination, the Site Management Plan proposed as the single component of Alternative No. 2 became unnecessary.

The State concurred in the selection of Alternative No. 2 prior to revision of the HHRA, provided that a restriction preventing residential use of the Site was placed into the deed transferring the Site out of Federal ownership, to which the Army agrees. While the Army does not believe that a deed restriction is necessary given the Site's unique location, it is consistent with Army policy when property is conveyed for non-residential use under an Economic Development Conveyance. The deed will also contain a prohibition against groundwater use. These restrictions will assure that the HHRA's no residential use and no groundwater use assumptions will remain valid in perpetuity unless the property is in the future cleaned up for unlimited use and unrestricted exposure. The continuing validity of the assumption will be verified every five years by the CERCLA § 121(c) reviews.

2.12.2 Description of the Selected Remedy

The Selected Remedy requires no further action. Because chemicals remain at the AOCs above concentrations that allow for unlimited use and unrestricted exposure, a CERCLA § 121(c) review will be conducted every five years until the Army and the State concur these reviews are no longer necessary.

2.12.3 Summary of Estimated Costs

There is no cost associated with implementing the No Further Action remedy. The estimated cost for conducting six Five-Year Reviews over the next 30-years is $60,000.

2.12.4 Expected Outcomes of the Selected Remedy

The Selected Remedy is expected to achieve the RAOs protecting Site workers from exposure to contaminated groundwater. The Selected Remedy also meets the CSCO, the soil ARAR, making the Site immediately available for commercial/industrial use.

The Selected Remedy does not address the slight and scattered exceedances of the GA groundwater standards in this groundwater. However, the shallow perched groundwater is not suitable for drinking water use due to its shallow nature and low flow. It is unlikely that the groundwater could produce adequate flow for drinking water purposes. The bedrock that occurs at depths ranging between 13 and 16 feet is overlain by 11 to 16 feet of silty clay, which has a very low permeability expected to be in the range of $1x10^{-5}$ to 1×10^{-7} cm/s. On top of the silty clay to the surface is 0 to 4 feet of sandy fill. This unconsolidated material is not expected to be sufficiently transmissive due to its very low permeability and 16-foot thickness. Twenty percent of the wells failed to produce any groundwater, and another ten percent failed to produce enough groundwater for a complete sample.

The Site is served by the public water utility and the perched groundwater's shallow nature, low production, and location adjacent to an airport make its use more than inadvisable. It is unlikely that an attempt to use the shallow groundwater could meet the location and construction standards for a permit that are set forth Subpart 5-2 and Appendix 5B of Title 10 of the Rules and Regulations of the State of New York, which would also require that Niagara County Health Department grant a shallow well variance because the well would be shallower than 19 feet.

2.13 STATUTORY DETERMINATIONS

2.13.1 Protection of Human Health and the Environment

There are no exposure pathways posing an unacceptable risk for the reasonably anticipated uses of the Site. The Selected Remedy therefore provides an adequate level of protection.

2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements

The Selected Remedy achieves the Commercial Soil Cleanup Objectives which is the ARAR for the reasonably anticipated use of the Site. The Selected Remedy does not meet the GA groundwater standard. However, it is unlikely that the shallow perched groundwater is usable for drinking water and the Site is served by a public drinking water utility.

2.13.3 Cost Effectiveness

The Selected Remedy achieves the RAOs at the lowest possible cost.

2.13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The Selected Remedy does not require any technology or action in order to achieve a permanent solution.

2.13.5 Preference for Treatment as a Principal Element

The Selected Remedy does not require the use of any treatment or other action in order to achieve the RAOs.

2.13.6 Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

2.14 DOCUMENTATION OF SIGNIFICANT CHANGES

Alternative No. 2, Implementation of a Site Management Plan was the Preferred Alternative presented in the Feasibility Study and the PP. The PP concluded that implementation of a Site Management Plan would satisfy the RAOs. Based on the conclusions of the corrected HHRA, the Army as the lead agency has determined that No Further Action is appropriate because calculated risks resulting from chemicals at the Site do not pose an unacceptable risk to human health and the environment.

Prior to drafting the PP, the HHRA had calculated that a construction worker's total potential exposure to groundwater was slightly greater than the USEPA acceptable carcinogenic risk range of 1.0E-4 to 1.0E-6 provided that the worker engaged in an excavation activity within the groundwater zone, but that there were no other unacceptable risks to commercial/industrial and construction workers. Based on this single risk to the construction worker, the Preferred Remedy in the PP was Implementation of a Site Management Plan (Alternative No. 2) requiring construction worker protection during excavation activities to achieve the remedial action objectives of reducing or eliminating inhalation of volatiles and dermal contact with groundwater.

Following receipt of public comments on the Proposed Plan, a review of the HHRA revealed an error in the human health risk calculations. An incorrect Averaging Time of one year had been used. Correcting the Averaging Time to the EPA risk assessment guidance required 70 years resulted in no unacceptable risk to the construction worker. Army compared the No Action Alternative to the Preferred Alternative, and determined that these attained equivalent levels of protection and were equally effective in achieving the RAOs and ARARs for the Site.

- Alternatives Nos. 1 and 2 offer equivalent protection to Site workers because there is no need for a Site Management Plan.
- Alternatives Nos. 1 and 2 both achieve the CSCO. Neither achieves the USCO.
- Neither Alternative 1 nor Alternative 2 achieves the groundwater GA standards.
- Both will require CERCLA § 121(c) Five-Year Reviews.

Army therefore selects No Further Action as the Selected Remedy because it imposes a lower degree of burden on future development while being equally protective of human health and the environment.

SECTION 3 – RESPONSIVENESS SUMMARY

There were no public comments on the Proposed Plan.

Prior to the correction of the HHRA, NYSDEC concurred in the selection of Alternative No. 2 as the Preferred Remedy provided that the United States places a restriction in the deed that prohibits residential use. While the Army does not believe that a deed restriction is necessary given the Site's unique location, it is consistent with Army policy when property is conveyed for commercial use under an Economic Development Conveyance. The deed will also contain a prohibition against groundwater use. These restrictions will assure that the HHRA's no residential use and no groundwater use assumptions will remain valid in perpetuity unless the property is in the future cleaned up for unlimited use and unrestricted exposure. The continuing validity of the assumption will be verified every five years by the CERCLA § 121(c) reviews. By law, the deed must also reserve the United States' right to impose additional future CERCLA remedies. If violations of the deed restrictions occur, Army can choose either to enforce the deed restrictions or to implement/enforce additional remedies.

The Army has considered and responded to the following State comments received February 18, 2015 from the Chief, Section C, Remedial Bureau A, Division of Environmental Remediation, NYSDEC.

Page 1: "New York State Department of Environmental Conservation (NYSDEC) [*concurs or concurs in part*] with the selected remedy."

Comment: Agree that this can say 'concurs'

Response: "Concurs" is selected.

Page 3: "The New York State Department of Conservation, as the support agency, has determined that No Further Action is appropriate for the AOCs. This remedy is protective of human health and the environment for the current and reasonably anticipated use of the Site."

Comment: DEC prefers to issue a concurrence letter rather than signing the ROD.

Response: The signature block with the above text will be removed from the document.

Page 10: "These exceedances were most likely the result of turbid water samples from the temporary well points."

Comment: This is suggested language. "These exceedances are most likely the result of turbid water samples from the temporary well points."

Response: Concur with suggested language.

Page 21: No Action (Alternative No. 1): Under this alternative, the Site would remain in its current state, with no additional controls in-place.

Comment: Change name of alternative here. Elsewhere in the text, including the declaration section, it is already referred to as 'no further action.'

Response: The text will be revised to read "No Further Action."

Page 25: "New York State Department of Environmental Conservation (NYSDEC) [*concurs or concurs in part*] with the selected remedy."

Comment: Agree that this can say 'concurs'

Response: "Concurs" is selected.

SECTION 4 – REFERENCES

CH2M Hill. *Environmental Condition of Property Report, Niagara Falls USAR Center, Niagara Falls, New York.* July 2007.

PARS Environmental, Inc. *PCB Spill Delineation Report, Outfall 5 Storm Water Culvert, Cleanup and Ditch Remediation.* May 2009.

PARS Environmental, Inc. *Remedial Action Report, PCB Spill Delineation Report, Outfall 5 Storm Water Culvert Cleanup and Ditch Remediation, Niagara Falls US AFRC, 9400 Porter Road, Niagara Falls, NY, NYSDEC Spill #0803478.* March 2010.

PARS Environmental, Inc. *Inspection Report, Niagara Falls AFRC, Building 2 and Former Fire Protection Main, 9400 Porter Road, Niagara Falls, Niagara County, NY.* June 2011.

PARS Environmental, Inc. *Quality Assurance Project Plan/Sampling Plan.* September 2011.

PARS Environmental Inc. *Final – Remedial Investigation/Interim Remedial Action Report and Human Health Risk Assessment.* December 2014.

PARS Environmental Inc. *Final Supplemental Investigation Report.* March 2013.

PARS Environmental Inc. *Final Revised Remedial Investigation/ Interim Remedial Action Report And Human Health Risk Assessment.* March 2013.

FIGURES

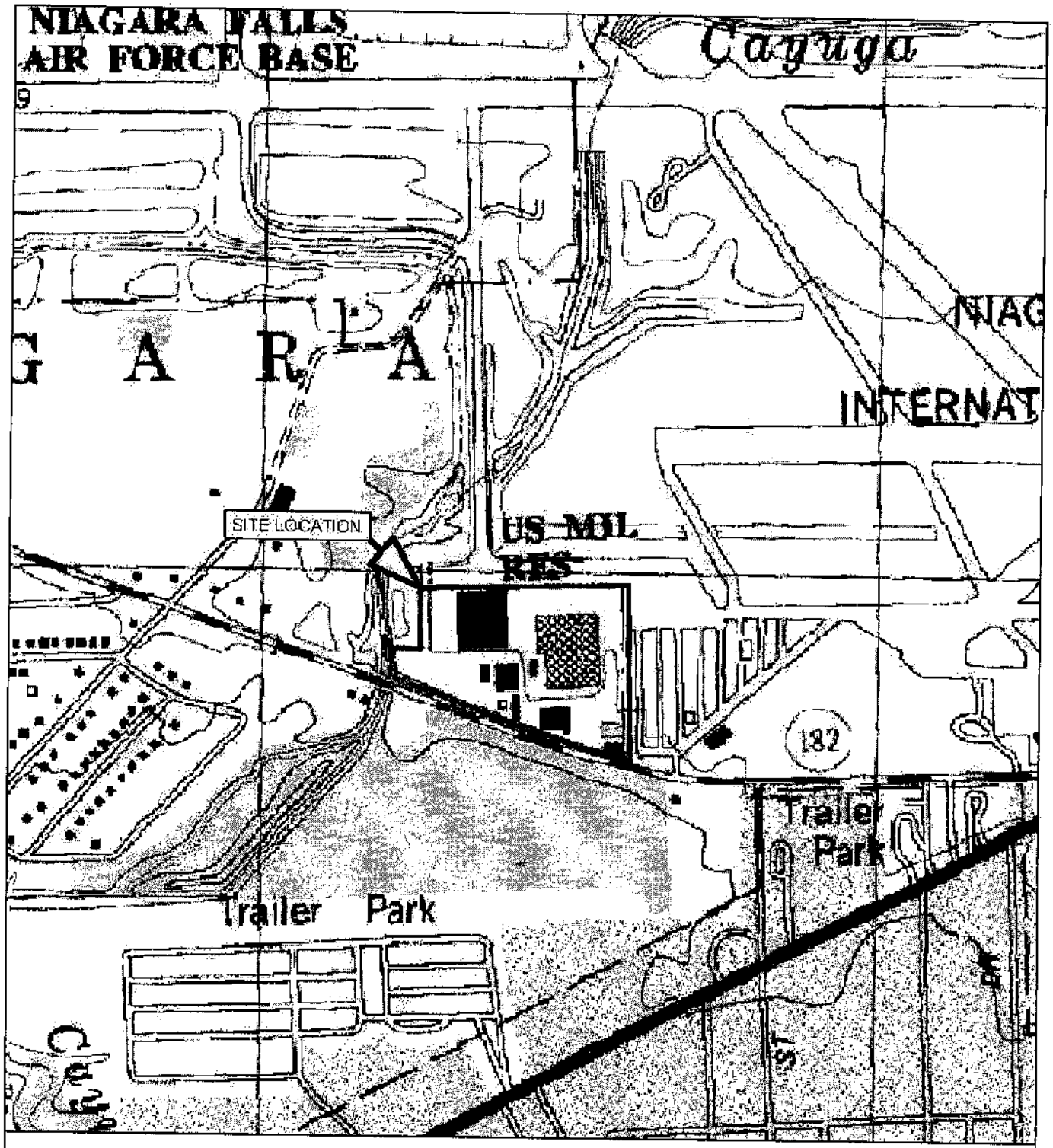
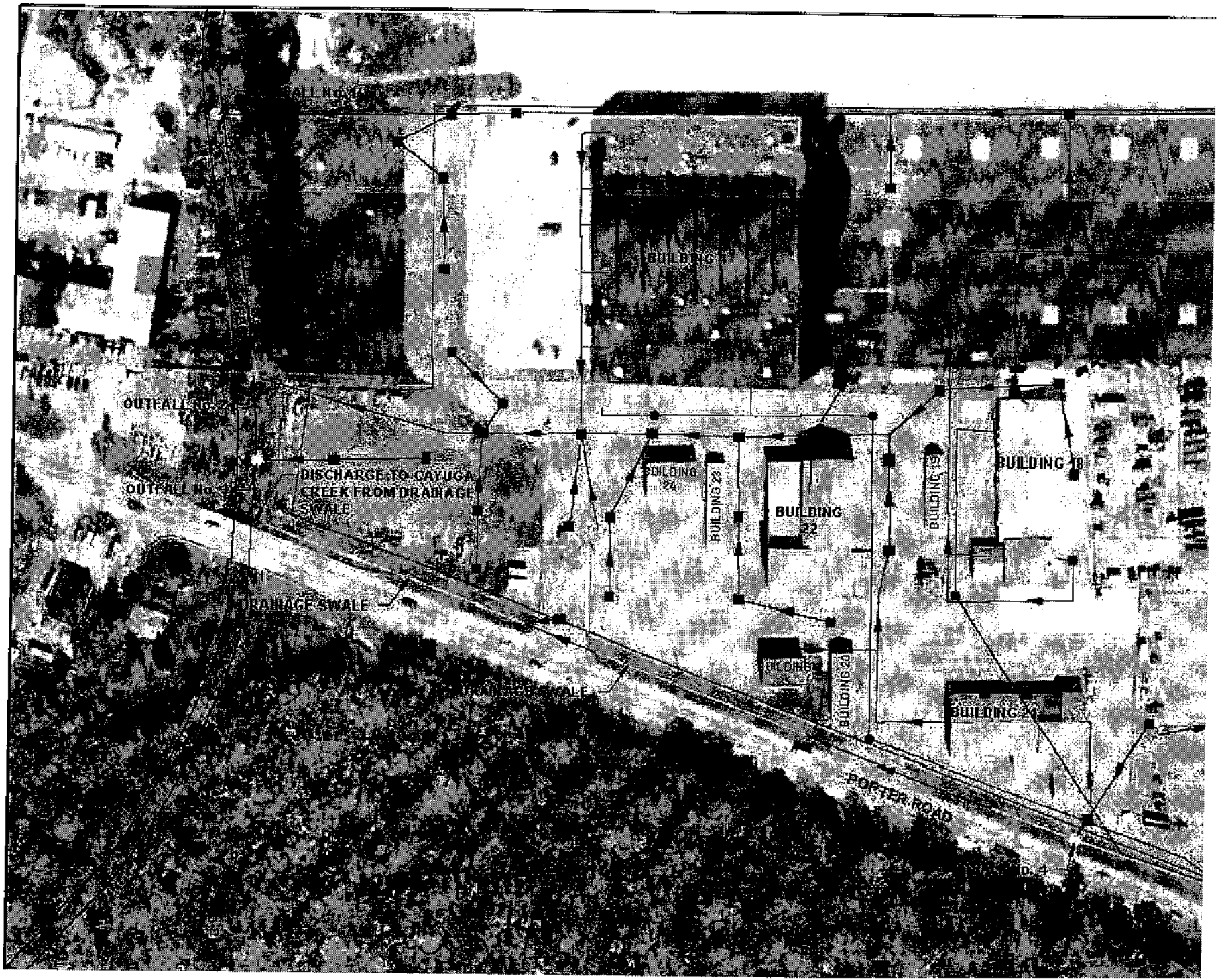


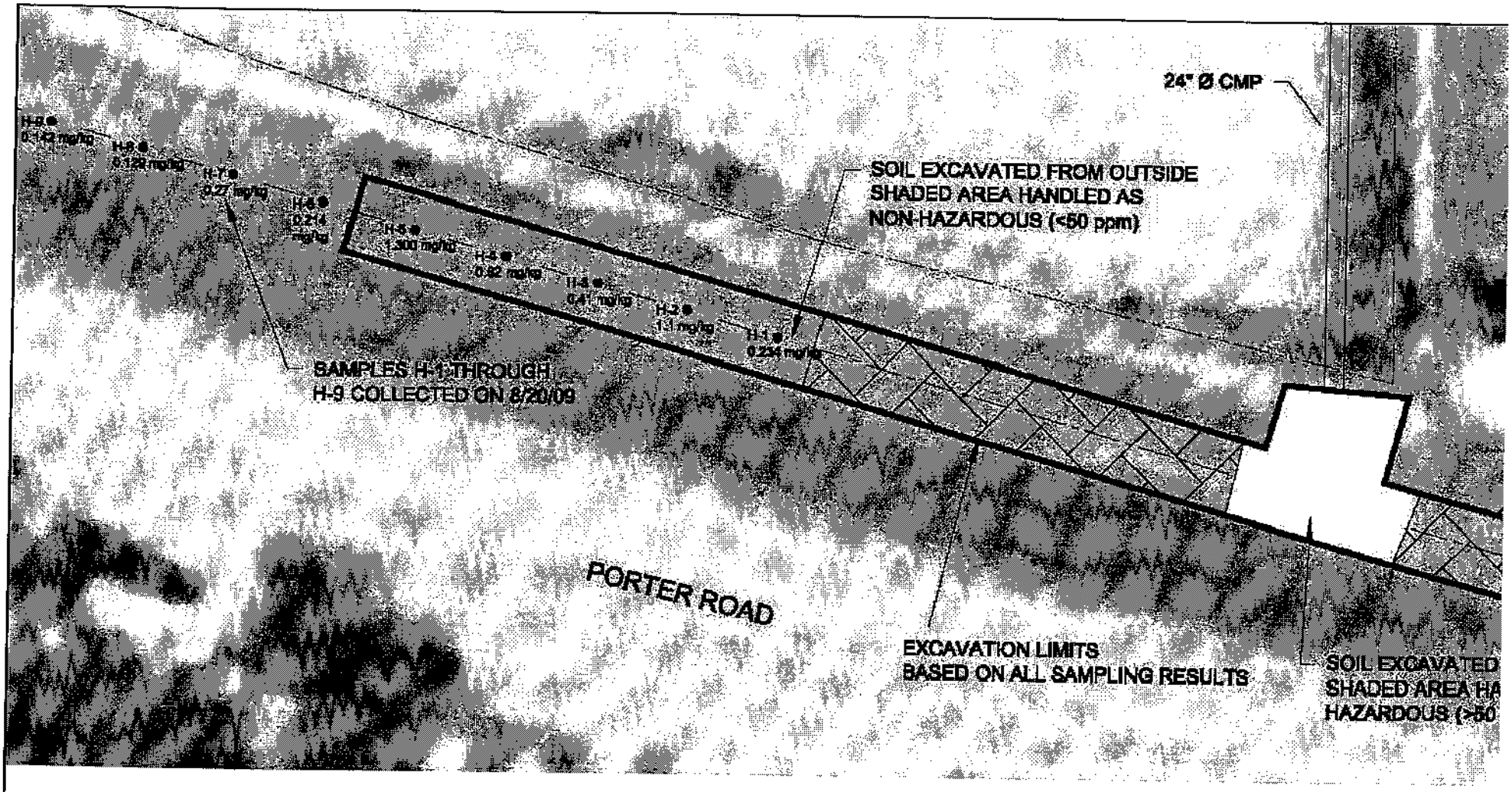
FIGURE 1
SITE LOCATION MAP
NIAGARA FALLS AFRC COMPLEX
NIAGARA FALLS, NEW YORK

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: JA	SCALE: 1"=750'	JOB No.: 895-08
CK'D. BY: TD	DATE: 11/29/11	FILE NO.: 895-08
REV. NO. ---	REV. DATE: ---	FIGURE NO.: 1


BUILDING
OUTFALL No. 2
DISCHARGE TO CAYUGA CREEK FROM DRAINAGE SWALE
OUTFALL No. 3
BUILDING 24
BUILDING 23
BUILDING 22
BUILDING 19
BUILDING 18
DRAINAGE SWALE
BUILDING 20
BUILDING 21
PORTER ROAD

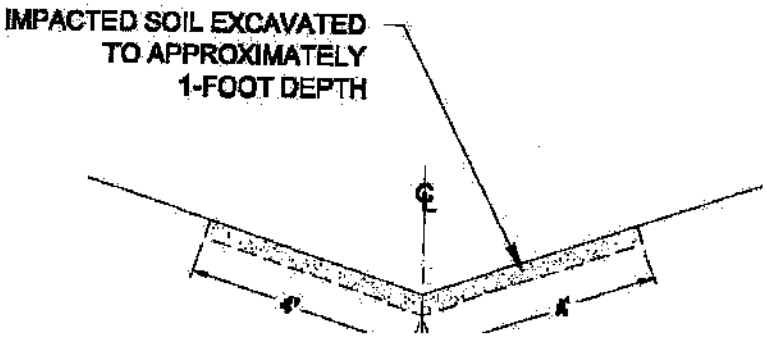

BUILDING 4
BUILDING 24
BUILDING 23
BUILDING 22
BUILDING 19
BUILDING 18
APPROXIMATE PROPERTY LINE
FORMER 10" DIAMETER FIRE PROTECTION MAIN
BUILDING 25
BUILDING 20
BUILDING 21
PORTER ROAD
FORMER BUILDING
OUTFALL No.4

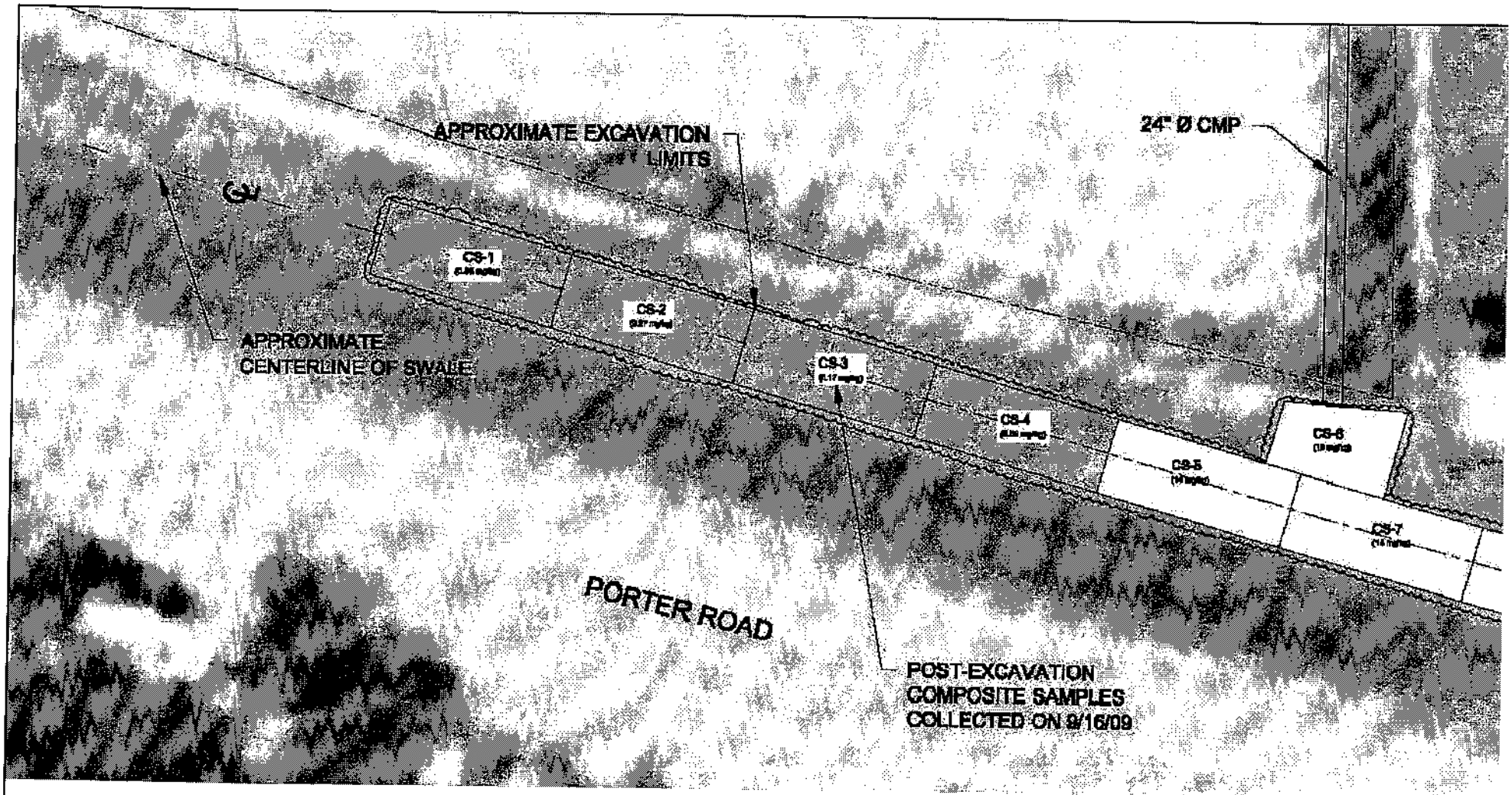


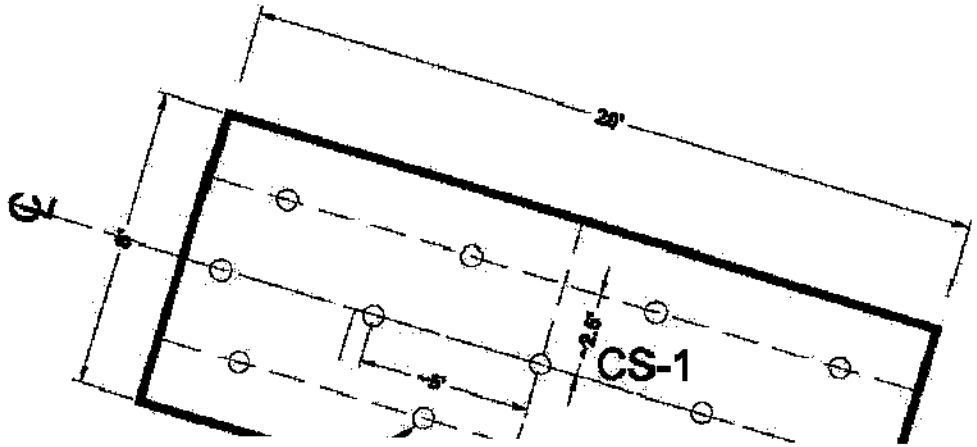
LEGEND:

H-2 ●
0.640 mg/kg

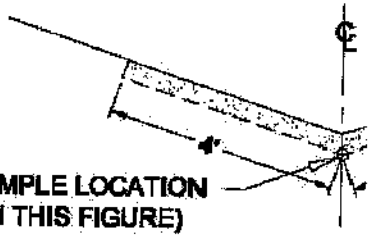
SAMPLE LOCATION, DESIGNATION AND CONCENTRATION OF POLYCHLORINATED BIPHYNOLS (PCB's)







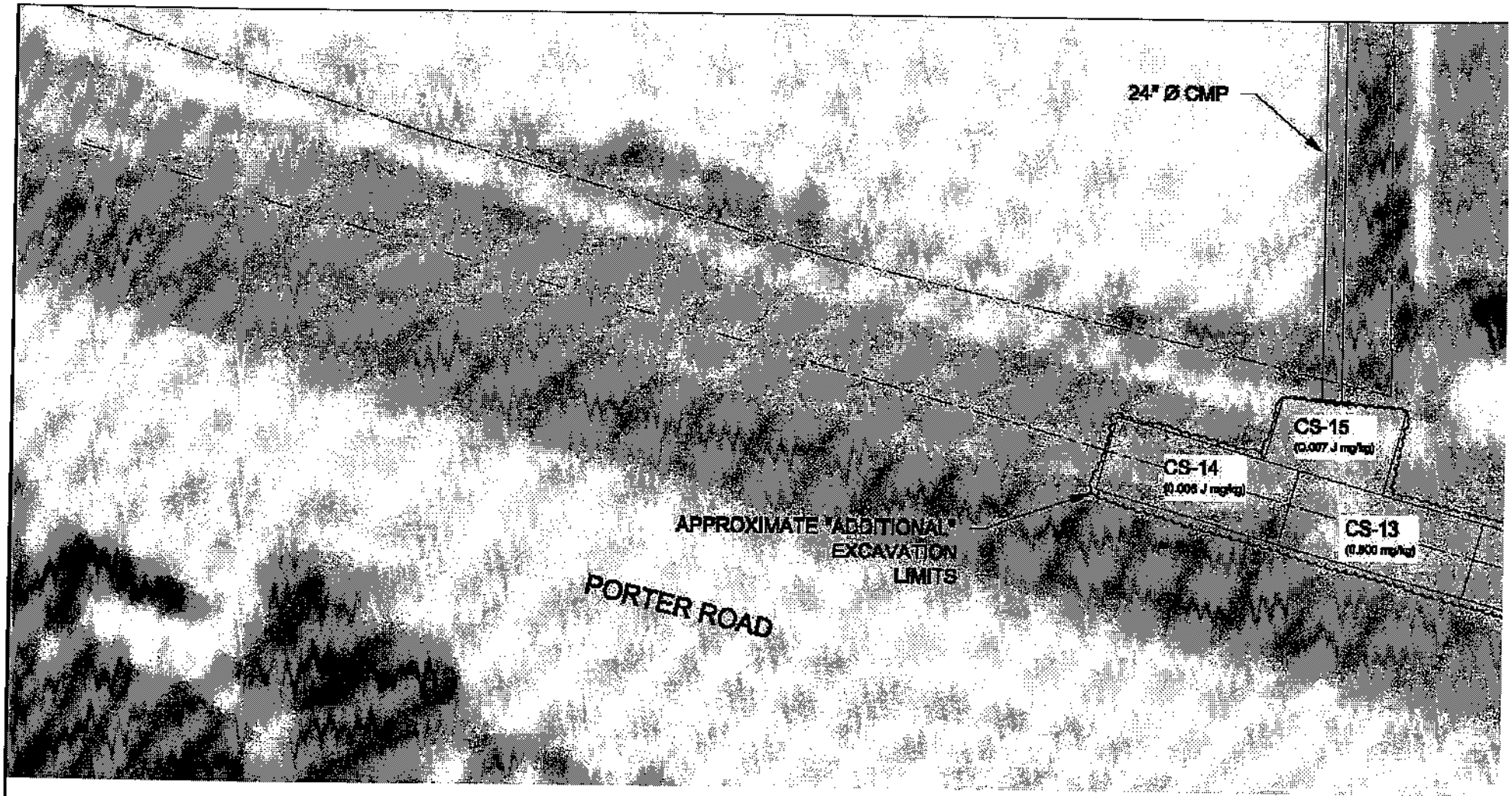
IMPACTED SOIL EXCAVATED TO APPROXIMATELY 1-FOOT DEPTH



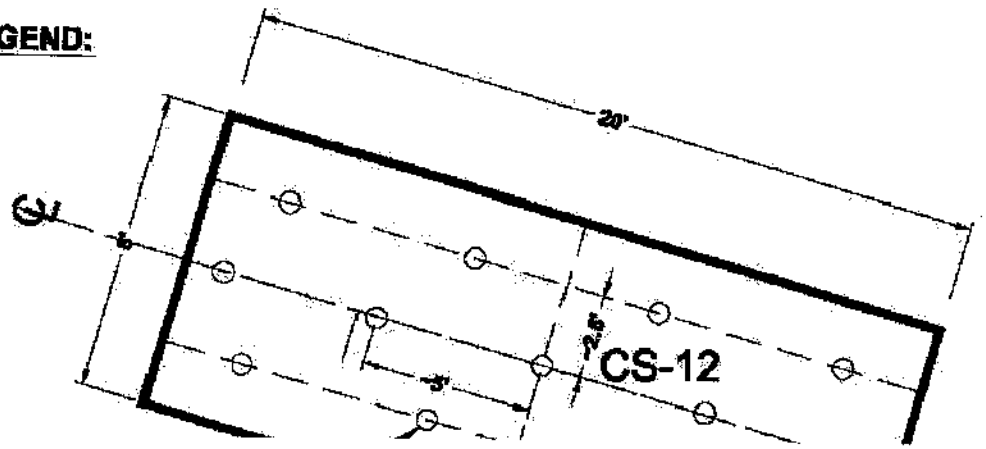
CONFIRMATORY SAMPLE LOCATION (AS SHOWN ON THIS FIGURE)

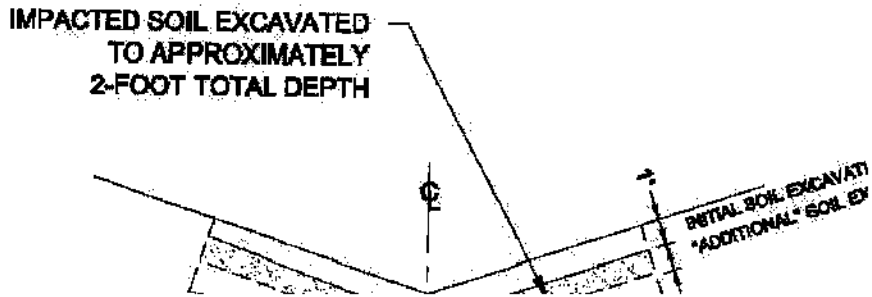
DITCH SE
NOT TO SCALE

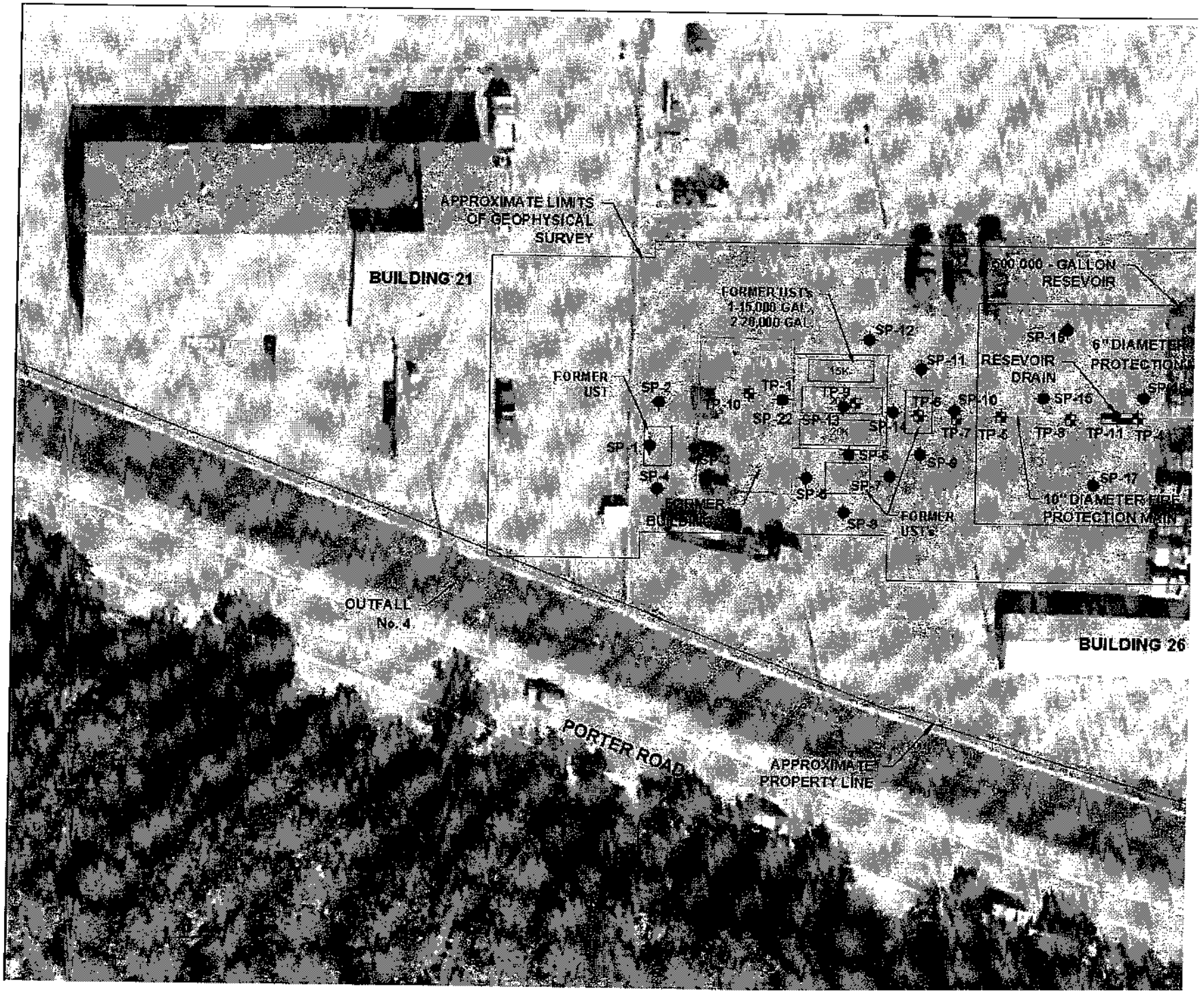
LEGEND:

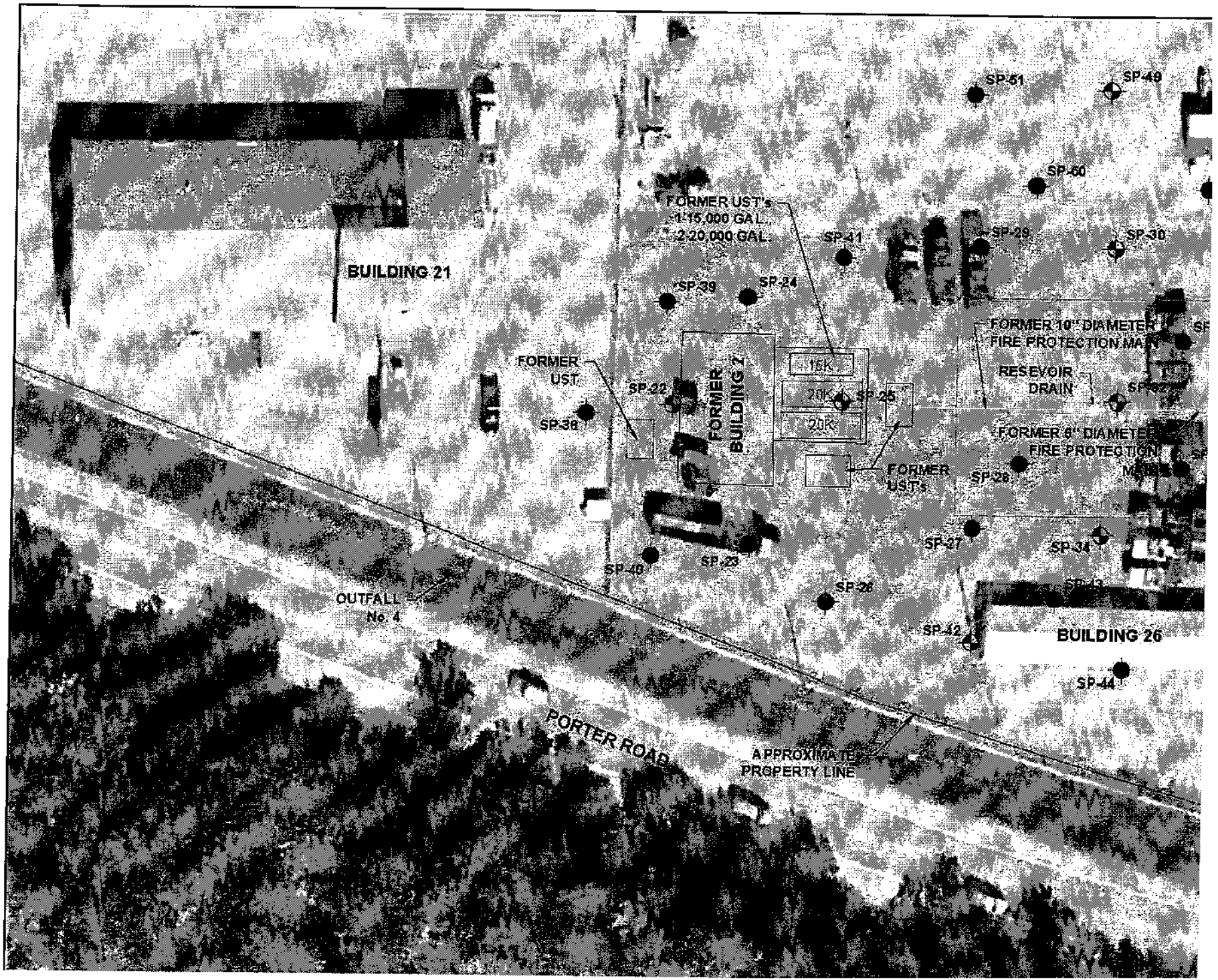

24" Ø CMP
CS-15
(0.007 J mg/kg)
CS-14
(0.006 J mg/kg)
CS-13
(0.900 mg/kg)
APPROXIMATE "ADDITIONAL" EXCAVATION LIMITS
PORTER ROAD

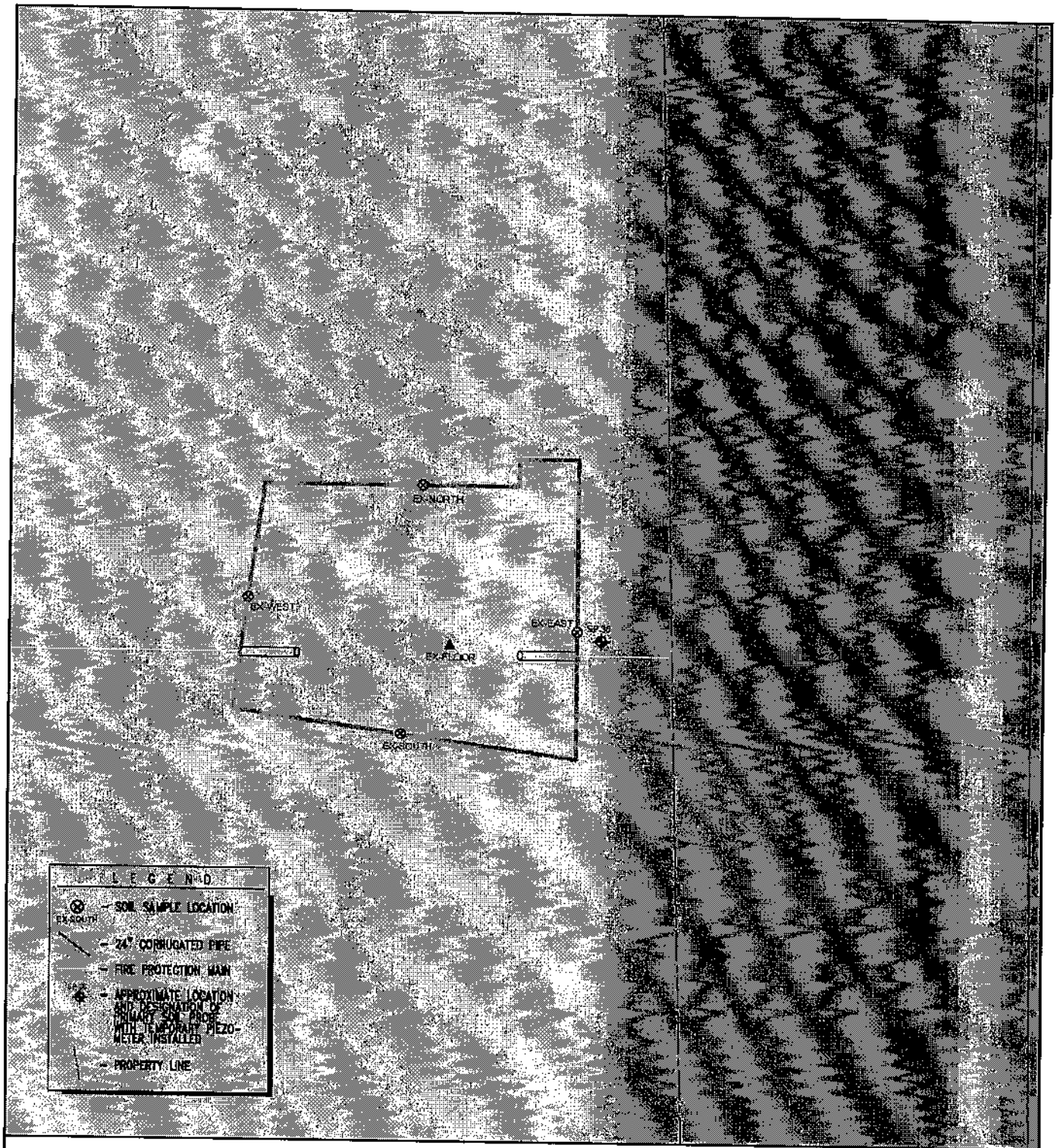
LEGEND:


20'
5'
2.5'
3'
CS-12


IMPACTED SOIL EXCAVATED TO APPROXIMATELY 2-FOOT TOTAL DEPTH
INITIAL SOIL EXCAVATI
"ADDITIONAL" SOIL EX


APPROXIMATE LIMITS
OF GEOPHYSICAL
SURVEY
BUILDING 21
FORMER USTs
1-15,000 GAL.
2-20,000 GAL.
500,000 - GALLON
RESEVOIR
SP-12
SP-16
6" DIAMETER
PROTECTION
SP-11
RESEVOIR
DRAIN
FORMER
UST
SP-2
TP-1
TP-2
TP-10
SP-22
SP-13
SP-14
TP-6
SP-10
TP-7
TP-8
SP-15
TP-9
TP-11
SP-1
SP-3
SP-4
SP-5
SP-6
SP-7
SP-8
SP-17
10" DIAMETER FIRE
PROTECTION MAIN
FORMER
USTs
OUTFALL
No. 4
BUILDING 26
PORTER ROAD
APPROXIMATE
PROPERTY LINE


SP-51
SP-49
SP-50
FORMER UST's
1-15,000 GAL.,
2-20,000 GAL.
SP-41
SP-29
SP-30
BUILDING 21
SP-39
SP-24
FORMER 10" DIAMETER
FIRE PROTECTION MAIN
FORMER
UST
15K
RESEVOIR
DRAIN
SP-22
FORMER
BUILDING 2
20K
SP-25
SP-38
20K
FORMER 6" DIAMETER
FIRE PROTECTION
MAIN
FORMER
UST's
SP-28
SP-27
SP-34
SP-40
SP-23
SP-26
OUTFALL
No. 4
SP-42
BUILDING 26
SP-44
PORTER ROAD
APPROXIMATE
PROPERTY LINE



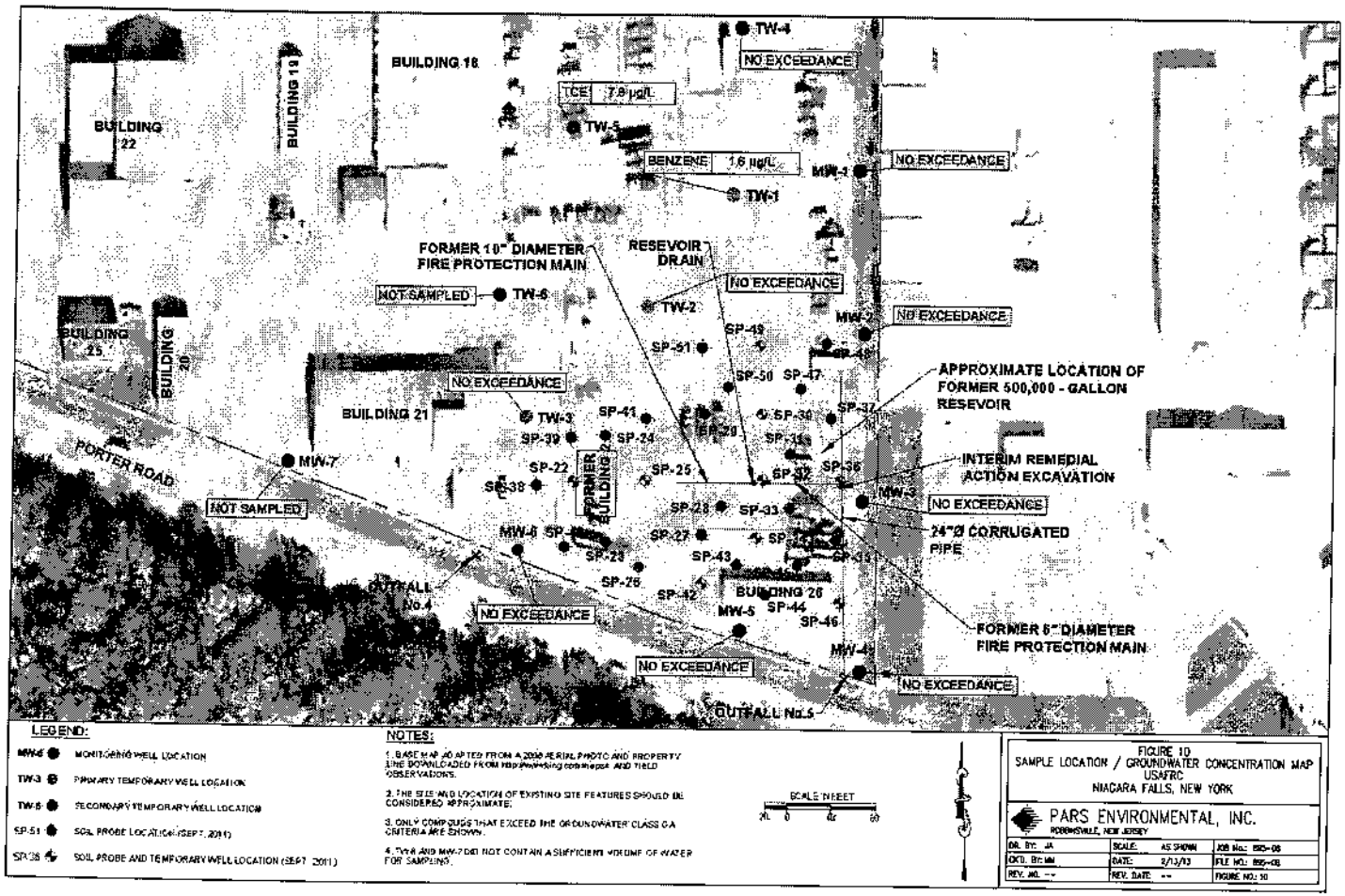
SCALE IN FEET

0 1 2 3 4 5

FIGURE 9
EXCAVATION LOCATION MAP
NIAGARA FALLS AFRC COMPLEX
NIAGARA FALLS, NEW YORK

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: JA	SCALE: 1"=5'	JOB No.: 895-08
CK'D. BY: TD	DATE: 11/29/11	FILE NO.: 895-08
REV. NO. ---	REV. DATE: --	FIGURE NO.: 9


BUILDING 18
BUILDING 19
BUILDING 22
BUILDING 25
BUILDING 20
BUILDING 21
BUILDING 26
TW-4
NO EXCEEDANCE
TCE 7.9 µg/L
TW-5
BENZENE 1.6 µg/L
MW-1
NO EXCEEDANCE
TW-1
FORMER 10" DIAMETER FIRE PROTECTION MAIN
RESEVOIR DRAIN
NOT SAMPLED
TW-6
NO EXCEEDANCE
TW-2
MW-2
NO EXCEEDANCE
SP-49
SP-51
SP-48
SP-50
SP-47
APPROXIMATE LOCATION OF FORMER 500,000 - GALLON RESEVOIR
NO EXCEEDANCE
TW-3
SP-41
SP-37
SP-39
SP-24
SP-29
SP-34
SP-35
INTERIM REMEDIAL ACTION EXCAVATION
PORTER ROAD
MW-7
SP-22
SP-25
SP-32
SP-36
SP-38
FORMER BUILDING 27
MW-3
NO EXCEEDANCE
NOT SAMPLED
SP-28
SP-33
MW-6
SP-27
SP-31
24"Ø CORRUGATED PIPE
SP-23
SP-43
SP-30
SP-26
OUTFALL No.4
SP-42
SP-44
SP-46
MW-5
FORMER 6" DIAMETER FIRE PROTECTION MAIN
NO EXCEEDANCE
MW-4
NO EXCEEDANCE
OUTFALL No.5
LEGEND:
MW-6 MONITORING WELL LOCATION
TW-3 PRIMARY TEMPORARY WELL LOCATION
TW-5 SECONDARY TEMPORARY WELL LOCATION
SP-51 SOIL PROBE LOCATION (SEPT. 2011)
SP-38 SOIL PROBE AND TEMPORARY WELL LOCATION (SEPT. 2011)
NOTES:
1. BASE MAP ADAPTED FROM A 2008 AERIAL PHOTO AND PROPERTY LINE DOWNLOADED FROM http://www.bing.com/maps/ AND FIELD OBSERVATIONS.
2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.
3. ONLY COMPOUNDS THAT EXCEED THE GROUNDWATER CLASS GA CRITERIA ARE SHOWN.
4. TW-4 AND MW-7 DID NOT CONTAIN A SUFFICIENT VOLUME OF WATER FOR SAMPLING.
SCALE IN FEET
0 40 80
FIGURE 10
SAMPLE LOCATION / GROUNDWATER CONCENTRATION MAP
USAFRC
NIAGARA FALLS, NEW YORK
PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY
DR. BY: JA
SCALE: AS SHOWN
JOB NO.: 855-08
CKD. BY: MH
DATE: 2/13/13
FILE NO.: 855-08
REV. NO.: --
REV. DATE: --
FIGURE NO.: 10