BEDROCK GROUNDWATER EVALUATION WORK PLAN

ANDERSON CLEANERS SITE
5 HUNT ROAD
JAMESTOWN, NEW YORK
BCP #C907027

Prepared For: Mr. Michael Lyons
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Project No.: 3563S-04

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1.0 INTRODUCTION

This document describes studies proposed to evaluate the quality of the groundwater within the bedrock down gradient of the source zone at the Anderson Cleaners, Inc. facility in Jamestown, New York (Anderson Cleaners).

Anderson Cleaners and Mr. Michael Lyons entered the Brownfield Cleanup Program (BCP) administered by the New York State Department of Environmental Conservation (NYSDEC) on October 14, 2004. Anderson Cleaners is located at 5 Hunt Road, Jamestown, New York (the "Site") and it is identified as BCP site #C907027. A Project Locus Map is included as Figure 1 and a Site Plan is included as Figure 2.

1.1 Background and Site History

The Site consists of an approximate 2.4-acre parcel, which is located partially in the City of Jamestown and partially in the Town of Ellicott, New York. The Site was initially developed in the 1930's as a towel factory (i.e., the southwest portion of the current building, which is currently used as a "Finishing Area"), and by the mid-1940's Anderson Cleaners occupied the Site and operated a laundry and dry cleaning business. The south-central portion of the building was constructed in 1947 (i.e., generally the current "Laundry and Dry Cleaning Area" and a portion of the "Office Area"). In 1985, a fire destroyed the northern and eastern portions of the south-central portion of the building (approximately 8,000 square feet). The fire did not directly impact the portion of the building that housed dry cleaning operations, but some dry cleaning equipment suffered heat damage and dry cleaning fluids may have been released to the environment as a result of the fire. Following the fire, reconstruction/remodeling operations were undertaken resulting in the current structure, which has a footprint of about 11,400 square feet.

Anderson Cleaners personnel report that Stoddard Solvent was used for dry cleaning operations from approximately 1947 to 1978. The use of Stoddard Solvent was discontinued around 1978 when tetrachloroethene (PCE) was first used as the primary dry cleaning agent. In 2002, new dry cleaning equipment that used a hydrocarbon-based solvent (DF 2000) was installed and all use of PCE was discontinued at the Site.

1.2 Conceptual Site Model

Subsurface Conditions

The Site is underlain by overburden deposits that extend to depths of about 16.3 feet to 22.0 feet below the ground surface. Fill material typically comprised of silty sand and gravel often intermixed with pieces of bricks, concrete and wood is present below surface coverings that consist of lawn/landscape areas, asphalt pavement or buildings. The fill material extends to depths ranging from about 2^{+} feet to 8 feet below the ground surface. In some of the test borings advanced at the Site, an approximate 0.5-foot layer of peat was encountered below the fill material. However the fill materials typically overlay glacial deposits consisting of interbedded mixtures of sandy silt and clayey silt often containing lesser amounts of sand, gravel and occasional cobble-size material. In some locations, the sandy silt and clayey silt deposits contain seams of sub-angular to rounded gravel and sand (i.e., likely deposited via glacial melt water). The sandy silt and clayey silt deposits are

approximately 4 feet to 12 feet thick extending beneath the fill to the top of a glacial till deposit. The glacial till is typically medium dense gray-brown silty sand with lesser amounts of clay and rock fragments. The glacial till is approximately 3 feet to 7 feet thick extending to the top of fractured shale bedrock and it is winnowed with seams of permeable sand and gravel evident in some locations. The indigenous soil is typical of the ground moraine deposits common in the area of the Site.

It is anticipated that a weathered shale layer (i.e., attributable to glacial scour and groundwater movement) may extend from the base of the glacial till until competent bedrock is encountered. The weathered shale at the top of rock is a prominent water-bearing zone beneath the Site.

During subsurface studies conducted within the "Courtyard Area" of the Site (refer to Figure 2), a 6-inch diameter clay tile pipe was encountered in the approximate center of the Courtyard beginning at a depth of approximately 2^{+} feet below the ground surface. This 6-inch clay tile pipe extends to the southwest the entire length of the Courtyard and upon exiting the Courtyard the pipe changes direction and heads generally east. Dye testing indicated that the 6-inch clay tile pipe ultimately discharges into a storm sewer located within a parking lot on the eastern side of the building at the Site. During studies completed within the Courtyard Area of the Site, an approximate 4-foot long section of the clay tile pipe was found to be broken and testing of soil samples collected in proximity of the broken clay tile pipe, indicated the presence of concentrations of tetrachloroethene (PCE) that exceeded 60 parts per million (ppm) and lower concentrations of associated breakdown products.

Groundwater Conditions

Test borings advanced via direct push methodologies encountered refusal at depths of about 10 feet to 15 feet below the ground surface (i.e., terminating at or near the top of the glacial till). The groundwater levels in monitoring wells installed within these test borings (designated herein as top of glacial till monitoring wells) were measured at depths ranging from about 1 to 5 feet below the ground surface. Test borings advanced by conventional rotary drilling techniques were able to penetrate the glacial till and terminate within fractured bedrock. The groundwater levels in monitoring wells installed within these test borings (designated herein as bottom of glacial till monitoring wells) were measured more than 2 feet above the ground surface exhibiting flowing artesian conditions. In locations where a top of glacial till monitoring well and a bottom of glacial till monitoring well were installed in proximity, upward hydraulic gradients were evident.

Groundwater generally flows to the east-southeast across the Site in both the top of glacial till and bottom of glacial till zones. During the August 18, 2005 monitoring event, an average horizontal gradient of 0.011 ft/ft was calculated in the bottom of glacial till monitoring wells. Based upon the testing conducted to date, an average hydraulic conductivity of 6.83×10^{-3} cm/sec was measured in select bottom of glacial till monitoring wells. Using the average values for horizontal gradient and hydraulic conductivity and an assumed porosity value of 0.35 to 0.50, a groundwater velocity within the bottom of glacial till zone was calculated to range between about 0.43 ft/day and 0.62 ft/day.

Contaminants of Concern

As discussed previously, the Site has been used for dry cleaning operations and PCE was previously used as the primary dry cleaning agent. In the past, PCE entered the subsurface and this has resulted in PCE and associated and breakdown product impact to the soil and groundwater at the Site. The contaminants of concern (COC) identified in soil and groundwater at the Site include:

- tetrachloroethene (PCE)
- trichloroethene (TCE)
- 1,1-dichloroethene (1,1-DCE)
- cis-1, 2-dichloroethene (cis-1, 2-DCE)
- trans-1, 2-dichloroethene (trans-1, 2-DCE)
- vinyl chloride (VC)
- 1,1,1-trichloroethane (1,1,1-TCA)
- Dense Non-Aqueous Phase Liquid (DNAPL)

Contaminant Distribution and Migration

The highest concentrations of COC were measured in soil and groundwater samples collected in proximity to the Courtyard Area of the Site. COC, in the form of DNAPL and dissolved constituents, have migrated to the east-southeast through the groundwater. It is also possible that some preferential migration has occurred along the bedding of the 6-inch clay tile pipe and potentially along other buried utilities crossing the Site.

Since July 2006, DNAPL has been observed, and removed from various monitoring wells installed at the Site including: monitoring well MW-204 (located in the Courtyard Area in the vicinity of the break in clay tile pipe), monitoring well MW-207 (located near the southeastern corner of the building), PW-3 (located within the laundry/dry cleaning area of the building) and WP-2 (located inside the building near the southeastern corner). To date, more than 100 gallons of DNAPL has been removed from the above monitoring wells using a combination of bailers and a vacuum purge system.

The DNAPL provides a constant source of dissolved phase PCE and other COC (i.e., the result as breakdown products) in the groundwater. It is possible that some preferential dissolved contaminant flow could occur along buried utilities and this appears to be supported by the concentrations of COC measured in samples collected from monitoring well MW-201, which is positioned adjacent to a 4-inch diameter sanitary sewer located in Huxley Street. A summary of detected halogenated VOCs measured in groundwater samples collected from various monitoring wells installed at the Site is presented as Table 1.

1.3 Existing Bedrock Well BR-01

A bedrock well, designated BR-01, is located within the current Rug Cleaning Area in the building at the Site (refer to Figure 2). BR-01 was originally installed as a water supply well and it was formerly used to feed the boiler system in the 1950s through the mid-1960s. Currently, BR-01 is unused and it consists of an 8-inch diameter "open hole" that contains a steel casing through the overburden and into competent bedrock. Information obtained from Mr. Bob Ehmke (Ehmke Drilling) during a telephone interview indicates that BR-01 was installed in 1954 and it is approximately 100 feet deep (31 feet of casing and 69 feet of uncased hole in the rock).

On March 18, 2005, DAY personnel evaluated the bedrock well BR-01 using a Heron Oil/Water Interface Meter Model H.O1L by measuring depth to water, well depth and evaluating the presence of non-aqueous phase liquid (NAPL) within the well. Water was measured at a depth of 1.52 feet below the concrete floor and the bottom of the well was measured to be 97.4 feet below the concrete floor. No layers of NAPL were identified within the well.

2.0 SCOPE OF WORK

The work to be performed under this Work Plan is described in the sections presented below.

2.1 Installation of Bedrock Monitoring Wells

As shown on Figure 2, it is proposed that bedrock wells be installed in two locations at the Site. At location BR-02, two monitoring wells will be installed including a well with the well screen placed within the fractured rock zone occurring at the top of rock (designated BR-02FR) and an adjacent well installed within the competent rock (designated BR-02R). At location BR-03, only one well will be installed within the competent rock (designated BR-03R). [Note: Monitoring well BR-03R is located in proximity of existing monitoring well MW-04, which is a 20 foot deep well that is installed such that the well screen penetrates the fractured rock.] The locations shown on Figure 2 may be adjusted in the field based upon access considerations, buried utility locations, etc.

A subcontractor will be retained to provide a rotary drill-rig, crew and materials to advance test borings and install monitoring wells. At location BR-02FR, 6 ¼-inch inside diameter hollow stem augers (HSA) will be used to advance the borings through the overburden and into the underlying fractured bedrock (i.e., to an estimated depth of 20^{+} feet below the ground surface). Overburden samples will be collected ahead of the augers using a split spoon sampling device driven with a 140-pound hammer free-falling 30 inches in general conformance with ASTM 1586. Following the advancement of the HSA to refusal, a NQ core barrel will be used to advance the boring up to 5 feet through the fractured/weathered rock and into component rock to define the vertical thickness and physical nature of the fractured bedrock zone. Following the determination of the fractured rock zone thickness, a 2-inch diameter monitoring well will be installed. It is anticipated that this monitoring well will be constructed of PVC materials. However, if DNAPL is detected during drilling stainless steel well screen and will be substituted. The length of the well screen will be determined at the time of drilling so that the screen is placed only within the fractured rock zone. If necessary, the bottom of the test boring that extends into the competent rock will be grouted with a Portland cement/bentonite mixture prior to the placement of the well. Based on field observations a 0.5 to 1-foot long sump consisting of solid riser may be installed at the bottom of the well screen to facilitate the collection of DNAPL. The annular space surrounding the well screen will be backfilled with filter sand extending 0.5 feet above the top of the well screen. A minimum 2-foot thick bentonite seal will be placed above the sand pack and a cement/benonite mixture will be used to grout the annular space to the ground surface. Monitoring well BR-02FR will be completed such that the casing extends about 3 feet above the ground surface.

At locations BR-02R and BR-03R, 6 ¼-inch inside diameter HSA will be used to advance the test borings to auger refusal. Since overburden samples were collected from adjacent test borings/monitoring wells, the HSA will be advanced without the collection of split spoon samples. Subsequently, the holes will be reamed into the top of competent bedrock with a $5\ ^{7}/_{8}$-inch diameter tricone bit (or similar). After the holes have been reamed and flushed to remove cuttings, 4-inch diameter low carbon steel casing will be placed in each boring. The 4-inch low carbon steel casing will extend from the bottom of the boring to about 3 feet above the ground surface. The casing will be grouted in place using a Portland cement/bentonite mixture and allowed to cure for a period of at least 24 hours. Following curing, a NQ core barrel will be used

to advance each monitoring well in maximum increments of 10 feet. As the rock core is retrieved, it will be evaluated to assess the type and nature of the rock and fractures within the rock (e.g., composition, structure, weathering, etc.). The intent of this evaluation will be to define the uppermost water-bearing zone within the competent bedrock. When a suspect zone is identified, field tests will be conducted to confirm that the zone is water bearing. This may include filling the 4-inch low carbon steel casing and boring with water to determine if the water discharges into fractures within the rock and/or purging the well and monitoring recovery rates. When testing confirms that the uppermost water-bearing zone has been encountered, drilling will be terminated. Upon completion, monitoring wells BR-02R and BR-03R will consist of 4-inch diameter low carbon steel casing that extends from about 3 feet above the ground surface to the top of the competent rock with open holes in the competent rock. [Note: In the event the fractured zone within the competent rock is not stable and the boring will not remain open, it may be necessary to install 2-inch diameter well screens and risers.]

Information recorded during the advancement of the bedrock wells will include:

- Date, boring identification and project identification
- Name of individual preparing the log
- Drill rig make and model
- Identification of alternative drilling methods (if used)
- Depths recorded in feet and fractions thereof (tenths of feet) referenced to ground surface
- The length of the sample interval and percentage of sample recovered
- Measurement of Rock Quality Designation (RQD) and identification of fracture types, weathering and orientation
- The depth of the first encountered water table, along with the method of determination, referenced to the ground surface
- Drilling and borehole characteristics
- Photoizonization Detector (PID) screening results of ambient headspace above selected samples
- Estimated amount of water (if any) lost to borehole during coring

A temporary decontamination pad will be constructed to clean "in-hole" drilling equipment between monitoring wells. The decontamination liquids will be pumped into NYSDOT-approved 55-gallon drums that are labeled and staged on-site in accordance with applicable regulations for future treatment/disposal. In addition, the soils, drilling liquids, and decontamination pad will also be containerized in NYSDOT-approved 55-gallon drums that are labeled and staged on-site in accordance with applicable regulations for future treatment/disposal by Anderson Cleaners.

2.2 Bedrock Monitoring Well Development

Approximately one week after bedrock monitoring well installation, bedrock monitoring wells BR-02FR, BR-02R and BR-03R will be developed to remove sediment that may have accumulated during drilling and well installation. Well development will be performed utilizing a pump and/or vacuum purge system and dedicated tubing. The well development procedures will be as follows:

- Obtain pre-development static water level readings

- Calculate water/sediment volume in well
- Set up equipment and begin pumping/purging
- Collect initial field water quality measurements (e.g., specific conductance, temperature, turbidity, and PID readings)
- Record water quantities removed and pumping rates utilized
- Collect field water quality measurements every five to ten gallons of water removed
- Stop development when water quality criteria are met
- Obtain post-development water level readings
- Document development procedures, measurements and quantities, etc.

Well development will continue until the following criteria is achieved:

- pH, specific conductance, and temperature are relatively stable for three consecutive measurements, and/or
- A minimum of five well volumes have been removed or a volume of water comparable to that introduced during the well installation is removed from the well.

The development water will be containerized, labeled and staged on-site in accordance with applicable regulations for future treatment/disposal by Anderson Cleaners. Alternatively, if the amount of water lost during drilling is too great, DAY may wait three to four weeks for the water to dissipate into the aquifer prior to performing well development.

2.3 Passive Diffusion Bag Sampling Procedure

Approximately one week following well development, bedrock monitoring wells BR-02FR, BR-02R, MW-04 and BR-03R will be sampled to determine the concentration of halogenated VOCs. In addition, a second round of groundwater sampling will be conducted approximately three months following the initial sampling event. During these sampling events, groundwater samples will be collected from specific depths within each well utilizing passive diffusion bag (PDB) samplers. The depth intervals selected will be based upon conditions observed during the advancement of the test borings to place the PDB samplers to intercept water-bearing zones in the bedrock.

During these sample events, the PDB sampler deployment and retrieval procedures will be as follows:

- Measure the well depth and compare the measured depth with the reported depth to the bottom of the well.
- Attach a stainless-steel weight to the end of the line selected to hold the PDB samplers. Sufficient weight will be added to counterbalance the buoyancy of the PDB samplers.
- Calculate the distance from the bottom of the well up to the point were the PDB sampler are to placed and attach the PDB hanger assemblies in the appropriate locations.
- Fill the PDB with deionized water by removing the plug from the sampler bottom, inserting a short funnel into the sampler and pouring deionized water into the sampler. The sampler will be filled until water rises and stands at least halfway into the funnel. Excess bubbles will be removed from the sampler and the PDB sampler will be filled to capacity. The funnel will be removed from the sampler and the plug reattached.
- Attach the PDB samplers to the weighted line utilizing the hanger assembly.

- Lower the weight and weighted line down the well until the weight rests on the bottom of the well and the line is taut. The PDB samplers should now be positioned at the expected depth.
- Secure the assembly by attaching the weighted line to a hook on the inside of the well cap. Reattach the well cap and seal the cap in a way that will prevent surface water intrusion.
- Allow the system to remain undisturbed as the PDB samplers equilibrate for minimum of 10 days.

Recovery of PDB samplers will be accomplished by using the following approach:

- Remove the PDB samplers from the well by using the attached weighted assembly line. During retrieval care will be taken to minimize PDB exposure to heat and agitation.
- Examine the surface of the PDB sampler for evidence of algae, iron or other coatings, and for tears in the membrane. Note the observations on the sampling log or field book. If tears in the membrane are identified, the sample should be rejected. Evidence of a coating on the PDB sampler (if any) noted.
- Detach and remove PDB sampler from the weighted line. Remove excess liquid from the exterior of the bag to reduce the potential for cross contamination.
- Transfer the water from PDB samplers to 40-mL VOC vials.
- Any unused water from the PDB sampler and water used to decontaminate cutting devices will be disposed of in accordance with applicable regulations.

In conjunction with the retrieval of the PDB samplers, field measurements of pH, oxygen reduction potential (ORP), specific conductivity, dissolve oxygen and temperature will be collected.

3.0 DATA EVALUATION AND REPORTING

Progress reports will be submitted as work progresses (i.e., following well installation/development, following receipt of the Sample Round 1 test results, etc.). These progress reports will include actions that have been taken toward achieving bedrock characterization, results of sampling rounds, logs and modifications to this Work Plan (if any). The final report describing the work completed and evaluation the need to complete additional characterization of the bedrock groundwater and/or presenting remedial options to address impacts to the bedrock groundwater quality will prepared after the receipt of the Sample Round 2 test results.

4.0 SCHEDULE

The schedule to complete the work described herein is based, in part, on the review time required by the NYSDEC and subcontractor schedules, but the following schedule is assumed to be a reasonable estimate.

- Work Plan Review and Approval by NYSDEC: 2 weeks

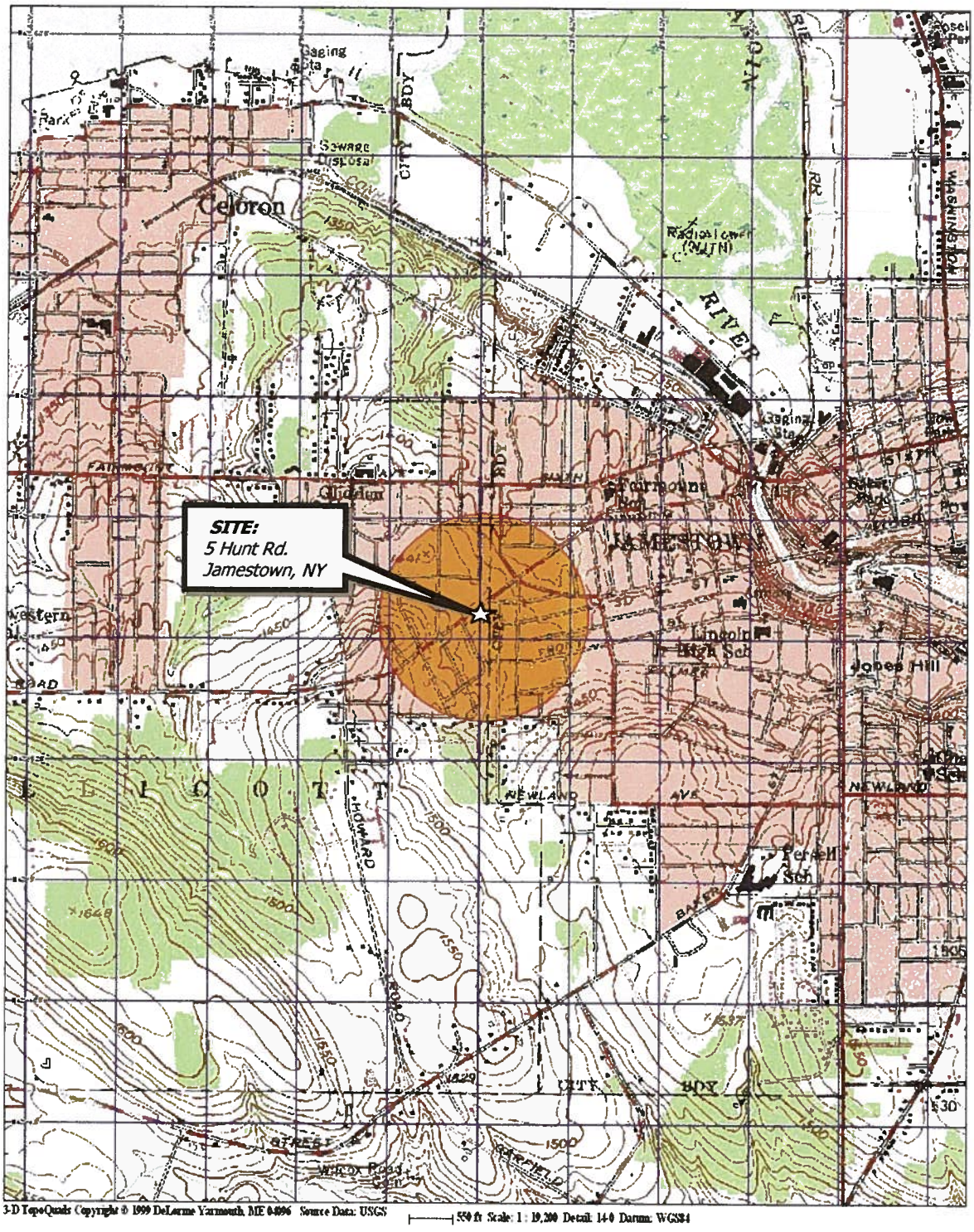
- Monitoring Well Installation and Development: Work completed 2 weeks following the approval of the Work Plan by NYSDEC

- Sample Collection (Round 1): PDB Samplers installed 1 week after the well development is complete. The PDB Samplers will be retrieved and submitted to the analytical laboratory approximately 10 days following installation. The analytical laboratory data will be available 1 week after submittal of the samples.

- Sample Collection (Round 2): This sample round will commence 3 months following Round 1 and it will require 3 weeks to complete (i.e., including sample collection and testing).

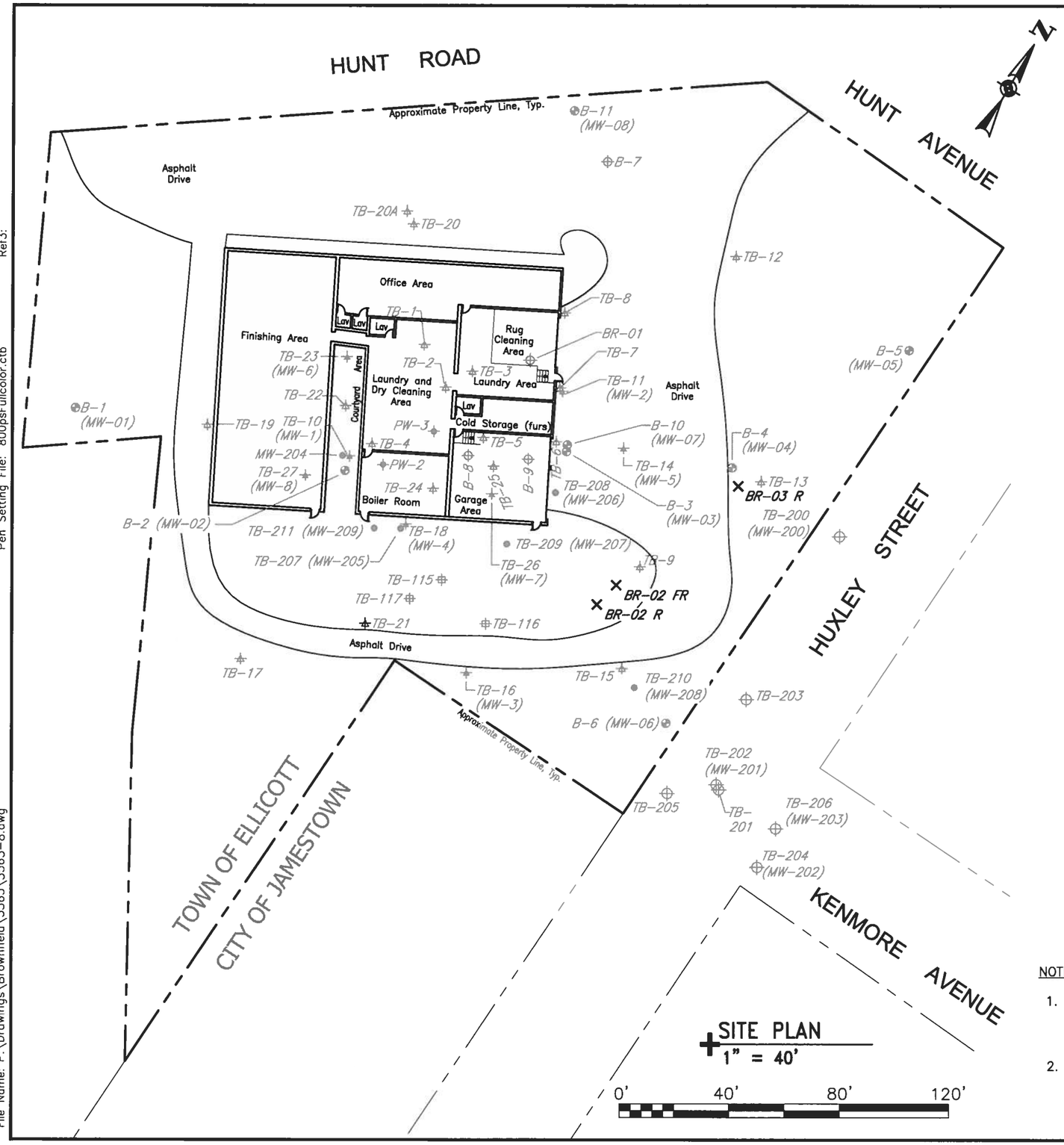
- Interim reports will be will be submitted as work progresses (i.e., following well installation/development, following receipt of the Sample Round 1 test results, etc.). The final report with recommendations will be submitted approximately 4 weeks after the receipt of the Sample Round 2 test results.

FIGURES



Drawing Produced From: 3-D TopoQuads, DeLorme Map Co., referencing USGS quad map Lakewood (NY) 1979 and Jamestown (NY) 1979. Site Lat/Long: N42°05.55'– W79°16.00'

DATE 08-30-2005 DRAWN BY RJM SCALE 1" = 2000'	day DAY ENVIRONMENTAL, INC. ENVIRONMENTAL CONSULTANTS ROCHESTER, NEW YORK 14614-1008	PROJECT TITLE 5 HUNT ROAD JAMESTOWN, NEW YORK REMEDIAL INVESTIGATION BCP #C907027 DRAWING TITLE PROJECT LOCUS MAP	PROJECT NO. 3563S-04 FIGURE 1



LEGEND:

TB–200 (MW–200)	Test Boring/Groundwater Monitoring Well Completed on April 6, 2006 and June 17, 2006
MW–204	4" Monitoring Well
B–1 (MW–01)	Test Boring/Groundwater Monitoring Well completed between May 2, 2005 and May 6, 2005 and on May 23, 2005
TB–11 (MW–2)	Test Boring with 1–Inch Diameter Monitoring Well installed during initial Phase II Environmental Site Assessment
PW–2	Test Boring/Groundwater Monitoring Well completed on October 13, 2004
B–7	Test Boring advanced between May 2, 2005 and May 6, 2005 and on May 26, 2005
TB–116	Test Boring advanced on February 7, 2005
TB–13	Test Boring advanced as part of initial Phase II Environmental Site Assessment
BR–01	Existing Bedrock Well
BR–02 FR	Proposed Monitoring Well installed in Fractured Rock
BR–02 R	Proposed Monitoring Well installed in Competent Rock

NOTES:

1. Site Plan produced from drawings by Habiterra Associates, Thorsell, Kennedy, Casker, Arnone & Hedin. P.C. entitled "Addition and Renovations, Anderson Cleaners, Inc", drawings A–1 Floor Plan dated October 22, 1985 and L–1 Grading Plan and from notes of site visits by representatives of Day Environmental, Inc.
2. Well locations MW–01, MW–02, MW–03, MW–04, MW–05, MW–06, MW–07 and MW–08 were obtained in the field by a Trimble GeoXT GPS. Other well and test boring locations were obtained by tape measurement from existing site structure. Locations should be considered accurate to the degree implied by the method used.

FIELD VERIFIED BY	NES
DATE	9-2009
DRAWN BY	RJM
DATE DRAWN	9-10-2009
SCALE	As Noted
DATE ISSUED	10-2-2009

day
DAY ENVIRONMENTAL, INC.
ENVIRONMENTAL CONSULTANTS
ROCHESTER, NEW YORK 14614-1008
NEW YORK, NEW YORK 10016-0710

PROJECT TITLE
5 HUNT ROAD
JAMESTOWN, NEW YORK

REMEDIAL INVESTIGATION - BCP #C907027

DRAWING TITLE
Site Plan With Proposed Bedrock Monitoring Well Locations

PROJECT NO.
3563S-04

FIGURE 2

Ref1:
Ref2:
Ref3:

Xerox432AnsiB–2; 11 x 17
Layout Name: Layout1
Pen Setting File: 800psfullcolor.ctb

Time Plotted: Wednesday, October 07, 2009 9:07:12 AM
File Name: P:\Drawings\Brownfield\3563\3563–8.dwg

TABLES

Summary of Analytical Laboratory Results

Anderson Cleaners Site
Jamestown, New York
BCP Site C907027

	Sample Locations and Sample Dates																		
	MW-01	MW-02	MW-03			MW-04							MW-05		MW-06					
Constituent	5/25/2005	1/12/2006	5/25/2005	1/12/2006	9/12/2006	5/25/2005	1/12/2006	1/4/2007	2/13/2007	3/15/2007	11/8/2007	7/24/2008	5/25/2005	1/12/2006	5/25/2005	1/12/2006	1/4/2007	2/13/2007	3/15/2007	7/24/2008
PCE	U (10)	2,090	1,400	1,040	1,560	1,200	1,230	1,820	1,120	904	189	734	2 E	U (2)	620	392	369	256	246	329
TCE	U (10)	U (20)	U (10)	U (20)	U (20)	1 E	U (20)	U (200)	U (200)	U (100)	1,220	113	U (10)	U (2)	1 E	U (10)	U (4)	U (5)	U (5)	U (5)
trans 1,2-DCE	U (10)	U (20)	U (10)	U (20)	U (20)	U (10)	U (20)	U (200)	U (200)	U (100)	187	U (20)	U (10)	U (2)	U (10)	U (10)	U (4)	U (5)	U (5)	U (5)
cis 1,2-DCE	U (10)	-	U (10)	-	-	U (10)	-	U (200)	U (200)	U (100)	3,830	101	U (10)	-	U (10)	-	U (4)	U (5)	U (5)	U (5)
VC	U (10)	U (20)	U (10)	U (20)	U (20)	U (10)	U (20)	U (200)	U (200)	U (100)	U (100)	U (20)	U (10)	U (2)	U (10)	U (10)	U (4)	U (5)	U (5)	U (5)
Total VOCs	0	2,090	1,400	1,040	1,560	1,201	1,230	1,820	1,120	904	5,426	948	2	0	621	392	369	256	246	329

Notes:

All samples tested for halogenated VOCs by USEPA Method 8260B and concentrations are shown in ug/L or parts per billion.

U (200) = constituent not detected at the concentration shown in parenthesis.

E = estimated concentration

PCE = tetrachloroethene

TCE = trichloroethene

trans 1,2-DCE = trans 1,2-dichloroethene

cis 1,2-DCE = cis 1,2-dichloroethene

VC = vinyl chloride

Summary of Analytical Laboratory Results

Anderson Cleaners Site
Jamestown, New York
BCP Site C907027

	Sample Locations and Sample Dates																						
	MW-07							PW-2			PW-3					MW-7			MW-7.1			MW-200	
Constituent	5/25/2005	1/12/2006	9/12/2006	1/4/2007	2/13/2007	3/15/2007	7/24/2008	10/21/2004	1/12/2006	8/8/2006	10/21/2004	5/25/2005	1/12/2006	8/8/2006	9/12/2006	11/23/2003	10/21/2004	5/25/2005	8/9/2006	9/12/2006	7/24/2008	4/20/2006	7/24/2008
PCE	9,600 E	8,590	9,170	5,310	6,440	4,240	11,600	91,400	29,700	50,400	108,000	74,000	64,700	34,100	23,100	53,300	53,700	73,000	113,000	120,000	78,100	U (2.0)	U (2.0)
TCE	6,500	U (200)	U (200)	U (200)	U (200)	U (200)	U (200)	U (2000)	U (1000)	U (1000)	9,070	8,100	7,360	8,150	9,040	U (1000)	U (2000)	81	U (1000)	U (1000)	1,120	U (2.0)	U (2.0)
trans 1,2-DCE	61	U (200)	U (200)	U (200)	U (200)	U (200)	U (200)	U (2000)	U (1000)	U (1000)	U (2000)	290 E	U (1000)	U (1000)	U (400)	U (1000)	U (2000)	U (10)	U (1000)	U (1000)	U (1000)	U (2.0)	U (2.0)
cis 1,2-DCE	7,100	-	-	U (200)	U (200)	U (200)	245	U (2000)	-	-	72,500	57,000	-	-	-	-	U (2000)	95	-	-	U (1000)	-	4.56
VC	1,000	U (200)	U (200)	U (200)	U (200)	U (200)	U (200)	U (2000)	U (1000)	U (1000)	13,800	12,000	17,900	20,400	5,490	U (1000)	U (2000)	2 E	U (1000)	U (1000)	U (1000)	U (2.0)	U (2.0)
Total VOCs	24,261	8,590	9,170	5,310	6,440	4,240	11,845	91,400	29,700	50,400	203,370	151,390	89,960	62,650	37,630	53,300	53,700	73,178	113,000	120,000	79,220	0	4.56

Notes:

All samples tested for halogenated VOCs by USEPA Method 8260B and concentrations are shown in ug/L or parts per billion.

U (200) = constituent not detected at the concentration shown in parenthesis.

E = estimated concentration

PCE = tetrachloroethene

TCE = trichloroethene

trans 1,2-DCE = trans 1,2-dichloroethene

cis 1,2-DCE = cis 1,2-dichloroethene

VC = vinyl chloride

Summary of Analytical Laboratory Results

Anderson Cleaners Site
Jamestown, New York
BCP Site C907027

	Sample Locations and Sample Dates											
	MW-201									MW-202	MW-203	
Constituent	4/24/2006	1/4/2007	2/13/2007	3/15/2007	8/31/2007	11/8/2007	4/2/2008	7/24/2008	12/20/2008	4/20/2006	7/12/2006	7/24/2008
PCE	10,500	14,200	2,610	423	1,000	402	U (100)	U (200)	U (200)	U (2.0)	U (2.0)	U (2.0)
TCE	970	U (200)	17,500	937	772 E	232	U (100)	U (200)	U (200)	U (2.0)	U (2.0)	U (2.0)
trans 1,2-DCE	U (200)	U (200)	1,290	94.4	361 E	141	U (100)	U (200)	U (200)	U (2.0)	U (2.0)	U (2.0)
cis 1,2-DCE	-	U (200)	7,860	U (20)	16,000	9,130	4,040	7,820	752	-	-	3.66
VC	U (200)	U (200)	U (200)	U (20)	566 E	1,180	1,710	4,260	1,050	U (2.0)	3.38	U (2.0)
Total VOCs	11,470	14,200	29,260	1,454	18,699	11,085	5,750	12,080	1,804	0	3.38	3.66

Notes:

All samples tested for halogenated VOCs by USEPA Method 8260B and concentrations are shown in ug/L or parts per billion.

U (200) = constituent not detected at the concentration shown in parenthesis.

E = estimated concentration

PCE = tetrachloroethene

TCE = trichloroethene

trans 1,2-DCE = trans 1,2-dichloroethene

cis 1,2-DCE = cis 1,2-dichloroethene

VC = vinyl chloride

Summary of Analytical Laboratory Results

Anderson Cleaners Site
Jamestown, New York
BCP Site C907027

	Sample Location: BR-01 and Sample Depth Intervals/Dates																	
	31.1 - 32.6			41.7 - 43.2				54.7 - 56.2			67.7 - 69.2		80.7 - 82.2			93.7 - 95.2		
Constituent	4/7/2005	9/15/2006	7/24/2008*	4/7/2005	5/24/2006	9/15/2006	7/24/2008*	4/7/2005	9/15/2006	7/24/2008*	4/7/2005	9/15/2006	4/7/2005	9/15/2006	7/24/2008*	4/7/2005	9/15/2006	7/24/2008*
PCE	7,100	7,030	8,190	10,000	7,610 E	8,440	9,460	2,900	150	5,270	230	154	190	165	U (200)	96	4,500	U (200)
TCE	3,400	U (200)	1,790	3,300	1,650	931	2,270	1,600	95.1	2,750	200	47.8	47	113	U (200)	18	2,800	U (200)
trans 1,2-DCE	12	U (200)	U (200)	14	U (50)	U (200)	U (200)	6 E	U (2.0)	U (200)	4 E	U (2.0	2 E	U (2.0)	U (200)	1 E	U (200)	U (200)
cis 1,2-DCE	1,700	U (200)	498	1,700	-	U (200)	704	910	69.8	1,650	420	137	490	242	4,960	27	1,850	4,930
VC	260	U (200)	495	280 E	163	U (200)	479	150	14.1	362	21	5.23	17 E	13.6	307	3 E	U (200)	312
Total VOCs	12,472	7,030	10,973	15,294	9,423	9,371	12,913	5,566	329	10,032	875	344.03	746	533.6	5,267	145	9,150	5,242

Notes:

All samples tested for halogenated VOCs by USEPA Method 8260B and concentrations are shown in ug/L or parts per billion.

U (200) = constituent not detected at the concentration shown in parenthesis.

E = estimated concentration

PCE = tetrachloroethene

TCE = trichloroethene

trans 1,2-DCE = trans 1,2-dichloroethene

cis 1,2-DCE = cis 1,2-dichloroethene

VC = vinyl chloride

* Sample intervals are approximately 1.3 feet higher than shown during the7/24/2008 sample round.