Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Erdle Perforating Site

State Superfund Project

Town of Gates, Monroe County, New York

Site Number 828072

December 2010

New York State Department of Environmental Conservation

DECLARATION STATEMENT - RECORD OF DECISION

Erdle Perforating
State Superfund Project
Gates (T), Monroe County, New York
Site No. 828072

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Erdle Perforating site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law, 6 NYCRR Part 375, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Erdle Perforating site and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Description of Selected Remedy

Based on the results of the remedial investigation/feasibility study (RI/FS) for the Erdle Perforating site and the criteria identified for evaluation of alternatives, the Department has selected in-situ electrical resistance heating system, to address on-site VOC soil and groundwater contamination; in-situ enhanced biodegradation could be implemented, if appropriate, to remediate site-related groundwater contamination contributing to the existing off-site soil vapor to indoor air pathway. The components of the remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance and monitoring of the remedial program.

2. The selected remedy includes the implementation of a full-scale in-situ electrical resistance heating system to address on-site VOC soil and groundwater contamination. Implementation of this alternative will consist of the installation of electrodes throughout the source area on approximately fifteen-foot spacing. Each electrode will be paired with one vapor recovery extraction well for vapor recovery. The vapor recovery system will include vapor phase treatment. Refer to Figure 7 for an illustration of the proposed layout of the electrical resistance heating system.

3. In-situ enhanced biodegradation could be implemented, if appropriate, to remediate site-related groundwater contamination contributing to the existing off-site soil vapor to indoor air pathway. The decision to conduct in-situ enhanced biodegradation during implementation of remedial action will be based upon the information from

the Remedial Investigation, results of the pre-design investigation and data gathered to evaluate the effectiveness of the electrical resistance heating of the on-site source area. Full-scale implementation of in-situ enhanced biodegradation will consist of the injection of the selected amendment(s) into the contaminated overburden and shallow bedrock aquifers along two separate horizontal transects; transecting the groundwater plume at locations MW-7/7D and MW-8/8D. The installation of injection points as permanent wells will allow for multiple rounds of injection without the need for mobilization of heavy equipment, and will also provide additional locations to monitor groundwater conditions. Subsequent rounds of in-situ biodegradation will be conducted, as appropriate, based upon evaluation of groundwater and vapor monitoring results. Refer to Figure 8 for an illustration of the proposed layout of the in-situ enhanced biodegradation injection transects.

4. Site restoration will include placing topsoil and seed over areas disturbed during the installation and removal of the in-situ electrical resistance heating system.

5. The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

6. Green remediation and sustainability efforts are considered in the design and implementation of the remedy to the extent practicable, including;
   - using renewable energy sources through the purchase of electricity generated by renewable sources.

7. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

   (a) requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).
   (b) land use is subject to local zoning laws, the remedy allows the use and development of the controlled property for:
   __residential use __restricted residential use **X** commercial use _industrial use
   (c) restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH;
   (d) requires compliance with the Department approved Site Management Plan;

8. Since the remedy results in contamination remaining at the site that does not allow for unrestricted use, a Site Management Plan is required, which includes the following:

   (a) a Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls:
To prevent exposure to contamination in groundwater until SCGs are met, institutional controls will include the implementation of land-use restrictions as set for the in Paragraph 9 above.

Engineering Controls:
The soil vapor mitigation systems, as discussed in Paragraph 5 above, will be in place and maintained to mitigate soil vapor intrusion in impacted properties.

This plan includes, but may not be limited to:

(i) Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
(ii) descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
(iii) provisions for the management and inspection of the identified engineering controls;
(iv) maintaining site access controls and Department notification; and
(v) the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls;

(b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but will not necessarily be limited to:

(i) monitoring of groundwater to assess the performance and effectiveness of the remedy; monitoring will consist of the sampling and analysis of both on-site and off-site groundwater monitoring wells for VOCs until remediation goals are achieved; it is assumed that long-term monitoring will be conducted on a periodic basis;
(ii) a schedule of monitoring and frequency of submittals to the Department;
(iii) provision to evaluate the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified;
(iv) provision to evaluate the potential for soil vapor intrusion for the existing on-site building if building use changes significantly or if a vacant building becomes occupied.

(c) an Operation and Maintenance Plan to assure continued operation, maintenance, monitoring, inspection, and reporting of for any mechanical or physical components of the remedy. The plan includes, but is not limited to:

(i) compliance monitoring of treatment systems to assure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;

(ii) maintenance and any necessary installation of soil vapor mitigation systems for residential structures to mitigate the soil vapor intrusion;
(iii) maintaining site access controls and Department notification; and
(vi) providing the Department access to the site and O&M records.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

_____ _____

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

RECORD OF DECISION
Erdle Perforating Site
State Superfund Project
Town of Gates, Monroe County, New York
Site No. 828072
November 2010

SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the above referenced site. The disposal of hazardous waste at the site has resulted in threats to public health and the environment that are addressed by this remedy presented in this Record of Decision (ROD). The disposal of hazardous wastes at this site, as more fully described in Sections 5 of this document, have contaminated various environmental media. The remedy, discussed in detail in Section 8, is intended to attain the remedial action objectives identified for this site in Section 6 for the protection of public health and the environment. This ROD identifies the selected remedy, summarizes the other alternatives considered, and discusses the reasons for the selected remedy. The Department has selected a final remedy for the site only after careful consideration of all comments received during the public comment period.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this ROD in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, 6 NYCRR Part 375.

SECTION 2: SITE DESCRIPTION AND HISTORY

2.1: Location and Description

The Site is located at 100 Pixley Industrial Parkway in the Town of Gates, Monroe County. The Site contains one 84,000 square foot facility building which was constructed in 1968. The main site feature is an occupied facility building which is surrounded by an asphalt parking area to the north and grass and wooded areas to the south, east and west. The Site and surrounding developed areas are serviced by public water. The Site is approximately 9.2 acres and is bounded on the south by Conrail railroad tracks and an undeveloped wooded area further south of the railroad tracks, on the north and east by light industry and on the west by open land and Interstate 490. A townhouse development (Hidden Valley Development) is located approximately 800 feet south of the Site. Refer to Figure 1 for the Site Location map.

The Site is currently active and is zoned for industrial purposes including manufacturing and processing. The surrounding parcels to the north, east and west, which include both undeveloped and developed properties, are also zoned for industrial purposes. The undeveloped and developed areas located south of the Conrail railroad tracks are zoned for one-family residential.

The property and land south of the Site is fairly low lying, with areas of intermittent stagnant water. A drainage swale is located along the west side of the Site parcel. The drainage swale passes under the railroad tracks, through the undeveloped wooded land south of the Site and eventually along the western edge of the Hidden Valley Development to a small pond located along the western edge of the development.

The Site is underlain by unconsolidated glacial till deposits consisting of silty fine sands and clays, with some small fine sand lenses and a sandy/gravel layer above bedrock (Onondaga Limestone). Groundwater at the Site is encountered one to two feet below grade surface (bgs) and shallow bedrock at the Site was encountered at seven to 18 feet bgs and determined to be highly fractured and water bearing. Groundwater flows south towards the small pond located in the Hidden Valley Development, although bedrock groundwater is believed to have a slight southeasterly flow component and may bypass the pond to the east. The site and surrounding vicinity are served by public water and therefore groundwater is not used as public drinking water.

2.2: Operational/Disposal History

The Erdle Perforating Company (Erdle) constructed its facility in 1968 on what was then farmland. Erdle continues to manufacture various types of perforated sheet metal products. Erdle used a variety of lubricants in its perforating processes which were removed from the finished product through the use of degreasing solvents, such as trichloroethene (TCE). From the early 1970's to 1987 Erdle collected spent trichloroethylene degreasing solvent in an underground storage tank (UST) prior to shipping off-site for disposal. The TCE UST was located adjacent to the southwestern edge of the building. Erdle also stored waste oils in a UST next to the TCE tank.

In February 1987, the on-site 2,000-gallon spent TCE UST failed a pressure test and was determined to have leaked into the subsurface. Subsequent soil and groundwater sampling confirmed that site soil and groundwater had been impacted by TCE. The TCE tank and several other tanks (including the waste oils tank formerly adjacent to the TCE UST) on the property were removed in 1987 along with approximately 100 cubic yards of contaminated soil. Erdle provided a report on these removals to the Department in July 1987 which resulted in the site being listed as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites. Erdle conducted an additional groundwater investigation in 1992 which confirmed the presence of TCE in the groundwater at concentrations exceeding Part 703 Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations.

2.3: Remedial History

As a result of identified hazardous waste disposal, the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York in December, 1987. A Class

2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

The Potentially Responsible Parties (PRPs) for the site are Erdle Perforating Company (Erdle) and Falcon Industries, LLC (the current property owner). In October 1994, Erdle entered into an Order on Consent with the NYSDEC to perform a Remedial Investigation/Feasibility Study (RI/FS) for the Site. In September 2006, the Site was referred to State Superfund after it was determined that the PRP was in violation of the site's Order on Consent. The remedial program at this site is currently being funded by New York State under the State Superfund Program.

The Site is currently being managed as a single operable unit (OU1) which consists of the on-site soil source area and off-site groundwater and soil vapor plumes as well as associated Interim Remedial Measures (IRM).

The site has been the subject of several regulatory investigations and actions. Below is a brief summary of the regulatory activities at the site:

- Consent Order B8-0185-87-05 signed by Erdle on October, 24, 1994
- Phase I Site Investigation completed in 1995 by Erdle
- Phase II Site Investigation was completed in 1996 by Erdle
- Installation of a Dual Phase Extraction System as IRM in 1997 by Erdle
- Remedial Alternatives Feasibility Study completed in 1998 by Erdle
- Off-Site groundwater monitoring wells installed and sampled in 1999 by Erdle
- Dual Phase Extraction System shut down by Erdle in 2002
- Limited Soil Vapor Intrusion (SVI) study off-Site in 2005 by Erdle
- Erdle Perforating Company Site referred to State Superfund in 2006 by NYSDEC
- SVI study performed off-Site in 2007 by NYSDEC

SECTION 3: LAND USE

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when assessing the nature and extent of contamination. For this site, alternatives that may restrict the use of the site, as described in Part 375-1.8 (g), are being evaluated in addition to unrestricted SCGs. The current use and zoning at the site, and the reasonably anticipated future use of the site, is industrial. The goal for the remediation of the site is to achieve unrestricted SCGs, to the extent feasible. The Department will evaluate unrestricted use SCGs (Part 375-6.8 (a)) and restricted use SCGs (Part 375-6.8 (b)) in assessing the nature and extent of contamination, and implement the least restrictive alternative feasible.

A comparison of the appropriate SCGs for the identified land use against the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in section 5.1.2.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include: The Erdle Perforating Company and Falcon Industries, LLC, the current property owner.

The Department and the Erdle Perforating Company entered into a Consent Order on October 24, 1994 [B8-0185-87-05]. The Order obligated the responsible parties to implement a RI/FS only remedial program. The Erdle Perforating Company was determined to be in violation of the Order and a notice of violation (NOV) was issued to Erdle on September 16, 2006.

The PRPs are subject to legal actions by the state for recovery of all response costs the state has incurred.

SECTION 5: SITE CONTAMINATION

A remedial investigation has been conducted to determine the nature and extent of contamination and to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the Remedial Investigation (RI) was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between September 2007 and April 2010. The field activities and findings of the investigation are described in the RI Report.

The RI included the following activities:

- Historical site data review,
- Soil boring and monitoring well installations,
- Sampling of pore water point installations for VOC analysis,
- Stream Piezometer Installation,
- Sampling of groundwater from overburden and bedrock monitoring wells for VOC, SVOCs and metals analysis,
- Sampling of soil for VOC, SVOCs, metals, pesticides and PCB analysis,
- Sampling of soil vapor, indoor air and outdoor air for VOC analysis, and
- Qualitative exposure assessment – Public Health Evaluation.

5.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and surface and subsurface soil. The NYSDOH has

developed SCGs for drinking water and soil vapor intrusion. The tables found in the following Sections list the applicable SCG in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized in Section 5.1.2. More complete information can be found in the RI Report.

5.1.2: Nature and Extent of Contamination

This section describes the findings for all environmental media that were evaluated. As described in the RI report, waste/source materials were identified at the site and are impacting groundwater, soil and soil vapor.

Groundwater

Samples were collected from overburden groundwater (encountered approximately 1 to 6 feet below grade surface (bgs)) and bedrock groundwater (bedrock encountered approximately 7 to 18 feet bgs) during the RI. The samples were collected to assess the groundwater conditions on-site in the vicinity of the historic TCE UST source area as well as off-site and downgradient of the source area. The groundwater samples were submitted for analytical analysis for VOCs, SVOCs, metals.

The groundwater sampling results indicate that the primary contaminants are VOCs in the overburden and bedrock groundwater associated with the historic TCE UST located south of the Site building. The groundwater VOC plume has been delineated to originate on-site in the vicinity of the historic TCE UST source area and continues downgradient off-site to the Hidden Valley Development in both overburden and bedrock groundwater. Figures 2, 3 and 4 illustrate the source area TCE contamination and the contaminated groundwater plume delineations compiled from data collected during the January 2008 and July 2008 sampling events, respectively.

The most frequent SCG exceedences were trichloroethene (TCE) and its associated breakdown products including cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride (VC). There is significant VOC contamination in the vicinity of the temporary groundwater grab sample GW-009 (Figure 2) located approximately 40 feet south of the historic TCE UST. The concentration of TCE detected (1,200,000 (Diluted (D)) µg/L), as well as the visual observance of product within the groundwater grab sample collected from GW-009, indicates the continued presence of TCE as a dense non-aqueous phase liquid (DNAPL) in the vicinity of the historic TCE UST. Elevated VOC concentrations in exceedance of their applicable SCGs were also detected for 1,1,1-TCA, 1,1,2-TCA, 1,1-DCA, 1,1-DCE, acetone, chloroform, methylene chloride, PCE and trans-1,2-DCE. No other VOCs were detected above the applicable SCG standards.

Isolated detections of SVOCs (specifically benzo(b)fluoranthene and chrysene) were detected within monitoring well MW-13 above their applicable SCG of 0.002 µg/L. Monitoring well MW-13 is adjacent to a paved parking area, and the detections likely represent asphalt runoff, and are not believed to be related to disposal activities at the Site.

Iron, magnesium, manganese, and sodium, were the only metals to exceed their applicable SCGs. Based on their presence in the background wells MW-5 and MW-5D, the detections of these elements likely represent naturally occurring conditions and are considered to represent site background conditions. Therefore, the metal compounds found in groundwater are not considered site specific contaminants of concern.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
1,1,1-Trichloroethane	0.2 - 4400	5	2 / 102
1,1,2-Trichloroethane	3.5 - 3.5	1	1 / 102
1,1-Dichloroethane	0.21 - 620	5	14 / 102
1,1-Dichloroethene	0.2 - 270	5	7 / 102
Acetone	1 - 1400	50	6 / 102
Chloroform	0.39 - 360	7	3 / 102
Cis-1,2-Dichloroethene	0.32 - 180000	5	66 / 102
Methylene chloride	2.5 - 130	5	1 / 102
Tetrachloroethene	0.22 - 2300	5	6 / 102
trans-1,2-Dichloroethene	0.21 - 1100	5	13 / 102
Trichloroethene	0.22 - 1200000	5	57 / 102
Vinyl chloride	0.26 - 14000	2	62 / 102
SVOCs			
Benzo(b)fluoranthene	0.56 - 0.56	0.002	1 / 23
Chrysene	0.39 - 0.39	0.002	1 / 23
Metals			
Aluminum	205 - 205	NS	NA / 23
Iron	445 - 8030	300	20 / 23
Magnesium	30600 - 154000	35000	21 / 23
Manganese	14.3 - 612	300	4 / 23
Sodium	7600 - 474000	20000	21 / 23

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Based on the findings of the RI, the disposal of hazardous waste has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are VOCs including TCE and its associated breakdown products cis-1,2DCE and VC.

Soil

Soil samples were collected at the site during the RI and during the Supplemental Soil Sampling Investigation which included soil samples collected from on-site locations to further evaluate the

potential presence of other contaminants in the soil at the Site. Soil samples were collected in the vicinity of the historic TCE UST source area and submitted for analytical analysis primarily for VOCs in order to delineate the soil impact from the historic release. The RI VOC soil sampling including the collection of sub-surface soil samples from beneath the southwest corner of the Site building and loading dock, south of the Site building adjacent to the former location of the historic TCE UST, and downgradient of the historic TCE UST location. The supplemental soil samples were collected from on-site locations including upgradient of the source area, within the source area, and downgradient of the source area within the wooded intermittent wetland area. The supplemental soil samples were submitted for analytical analysis of VOCs, SVOCs, metals, pesticides and PCBs.

The RI and Supplemental soil sampling results were compared to the applicable Soil Cleanup Objectives (SCOs) for unrestricted use and restricted use, as discussed in Section 3, and indicate that the primary contaminants of concern on-site are VOCs. Based on the comparison of the soil sampling results to the restricted use SCOs, commercial use SCOs were selected for the evaluation of the data, in addition to the unrestricted SCOs and the protection of groundwater SCOs (as appropriate). Initially, the use of industrial SCOs was planned (the site is zoned industrial and used for industrial purposes), but the evaluation indicated the use of commercial SCOs was feasible and commercial use SCOs are less restrictive than industrial SCOs.

The soil sample VOC results revealed that the presence of an on-going VOC contaminant source exists on the site in the vicinity of the historic TCE UST. The VOC contamination exceeding the unrestricted and protection of groundwater SCOs (the protection of groundwater SCOs are used to evaluate soil contamination only for the primary contaminants of concern listed in the groundwater section above) was determined to extend from beneath the southwestern portion of the Site building in the vicinity of the former TCE UST to south of the Site building as shown in Figure 4. The estimated area of soil VOC contamination is approximately 9,800 square feet and extends from approximately 3 to 15 feet bgs, for a total volume of approximately 4,360 cubic yards. Although TCE exceeded the unrestricted and protection of groundwater SCOs outside this area, these detections are limited to depths from 8 to 13 feet bgs and are more related to contaminants migrating off-site in groundwater than contaminants sorbed to the soil matrix at the downgradient property.

The most frequent unrestricted and protection of groundwater SCO exceedences were TCE and its associated breakdown products cis-1,2-DCE and VC. Elevated VOC concentrations in exceedance of their applicable unrestricted and protection of groundwater SCOs were also detected for 1,1,1-TCA, 1,1-DCA, 1,1-DCE, acetone, PCE and trans-1,2-DCE. No other VOCs exceeded the applicable unrestricted or protection of groundwater SCO standards. TCE was the only VOC to exceed its applicable commercial SCO. Refer to Figure 5 for TCE soil results.

SVOCs, primarily polyaromatic hydrocarbons (PAHs), were detected in one sample collected from the source area at concentrations exceeding the applicable unrestricted use SCOs. The concentration of two SVOCs, benzo(a)pyrene and dibenz(a,h)anthracene, within the source area sample also slightly exceeded the commercial SCOs. Although these two SVOCs were detected in one sample at concentrations exceeding the applicable unrestricted and commercial SCOs, these compounds tend to be ubiquitous in soils at historic industrial properties and do not appear to be attributable to a specific release on site.

Metals, with exception of the detection of zinc in exceedence of the unrestricted SCO in one background soil sample, were not detected at concentrations exceeding their applicable unrestricted SCOs. Detected concentrations of metals are consistent with the concentrations detected within background samples collected on-site and are not associated with the on-site historic TCE UST release. Therefore, metal soil contamination is not considered a site specific contaminants of concern.

Table 2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG	Protection of Groundwater SCG[d] (ppm)	Frequency Exceeding Protection of Groundwater SCG
VOCs							
1,1,1-Trichloroethane	0.017 - 12	0.68	3 / 59	500	0 / 59	0.68	3 / 59
1,1-Dichloroethane	0.043 - 0.89	0.27	3 / 59	240	0 / 59	0.27	3 / 59
1,1-Dichloroethene	0.023 - 0.58	0.33	2 / 59	500	0 / 59	0.33	2 / 59
Acetone	0.011 - 0.71	0.05	4 / 59	500	0 / 59	0.05	4 / 59
Cis-1,2-Dichloroethene	0.003 - 120	0.25	43 / 59	500	0 / 59	0.25	43 / 59
Tetrachloroethene	0.12 - 17	1.3	4 / 59	150	0 / 59	1.3	4 / 59
trans-1,2-Dichloroethene	0.018 - 0.25	0.19	1 / 59	500	0 / 59	0.19	1 / 59
Trichloroethene	0.007 - 2200	0.47	39 / 59	200	9 / 59	0.47	39 / 59
Vinyl chloride	0.023 - 8.2	0.02	30 / 59	13	0 / 59	0.02	30 / 59
SVOCs							
Benzo(a)anthracene	4.92 - 4.92	1	1 / 7	5.6	0 / 7	1	1 / 7
Benzo(a)pyrene	3.09 - 3.09	1	1 / 7	1	1 / 7	22	0 / 7
Benzo(b)fluoranthene	3.49 - 3.49	1	1 / 7	5.6	0 / 7	1.7	1 / 7
Benzo(k)fluoranthene	2.94 - 2.94	0.8	1 / 7	56	0 / 7	1.7	1 / 7
Chrysene	4.36 - 4.36	1	1 / 7	56	0 / 7	1	1 / 7
Dibenz(a,h)anthracene	0.649 - 0.65	0.33	1 / 7	0.56	1 / 7	1000	0 / 7
Indeno(1,2,3-cd)pyrene	1.82 - 1.82	0.5	1 / 7	5.6	0 / 7	8.2	0 / 7
METALS							
Chromium	5.9 - 17.7	1	7 / 7	400	0 / 7	19	0 / 7
Zinc	21.3 - 328	109	1 / 7	10000	0 / 7	2480	0 / 7

[a] ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

[b] SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

[c] SCG: Part 375-6.8(b), Restricted (commercial) Soil Cleanup Objectives.

[d] SCG: Part 375-6.8(b), Restricted (Protection of groundwater) Soil Cleanup Objectives.

Based on the findings of the Remedial Investigation and Supplemental soil sampling, the disposal of hazardous waste has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, VOCs including TCE, cis-1,2-DCE and VC.

Surface Water

Surface water samples were collected by the Monroe County Department of Public Health in June 2007 in order to determine if VOC impacted groundwater in the vicinity of the Hidden Valley Development was impacting surface water in the development. A total of five surface water samples were collected from sample locations including sump outfalls, drainage swales and the retention pond located within the Hidden Valley Development approximately 1,700 feet south to the Site to assess the surface water conditions downgradient of the site. No SCGs were exceeded for VOCs, indicating that VOC impacted groundwater has not impacted the surface water within the drainage swales or retention pond.

No site-related surface water contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for surface water.

Sediments

Attempts were made to collect sediment samples from the wooded wetland area located downgradient of the soil source area during the RI soil sampling. However, as the wetland is only intermittently wet, no standing water was observed in the wooded wetland area during the RI soil sampling. Soil samples within the drainage swale located along the western boundary of the site were not collected as it has been historically reported that the drainage swales are dredged regularly by the town Department of Public Works. As discussed within the soil media section above, soil samples collected within the wooded intermittent wetland area did not reveal detected concentrations exceeding applicable SCGs for SVOCs, Metals, PCBs, or Pesticides.

No site-related sediment contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for sediment.

Soil Vapor Intrusion

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of sub-slab soil vapor under structures and indoor air inside structures. The only structure located on-site is currently and has historically been used as an industrial facility utilizing the chemicals of concern (i.e., solvents including TCE), therefore, no soil vapor intrusion activities were conducted on-site. Due to the presence of residential structures located above the impacted groundwater plume downgradient of the site, sub-slab soil vapor, indoor air and outdoor air samples were collected to evaluate whether actions were needed to address exposures related to soil vapor intrusion.

Soil vapor intrusion investigations were conducted in a phased approach within the Hidden Valley Development, located approximately 800 feet south of the site. The soil vapor intrusion sampling has been conducted primarily during the heating season during the years 2007, 2008, 2009 and 2010 and has included the sampling of 55 residential structures. For each residential structure sampled, sub-slab soil vapor and indoor air samples were collected in order to assess the potential for exposure via soil vapor intrusion. Outdoor air samples were collected concurrently with the sub-slab soil vapor and indoor air samples in order to evaluate outdoor air (background) quality in the vicinity of the study area. The results of the soil vapor intrusion sampling primarily indicated the presence

of TCE and its associated breakdown products cis-1,2-DCE and VC, as well as PCE. Based on the SVI sampling results, TCE and methylene chloride were the only VOCs detected in indoor air samples at concentrations exceeding their respective SCG of 5 micrograms per cubic meter ($\mu g/m^3$) and 60 $\mu g/m^3$. Specifically, TCE was detected in 5 of 77 indoor air (Basement) samples at concentrations exceeding the SCG of 5 $\mu g/m^3$ and methylene chloride was detected in 1 of 40 indoor air samples at concentrations exceeding the SCG of 60 $\mu g/m^3$. The presence and concentrations of non-site related VOCs detected in the indoor air and outdoor air are consistent with typical background levels.

Sample results for each residential structure were individually evaluated in accordance with the NYSDOH Soil Vapor Intrusion Guidance in order to determine the necessity of further action. Based on the findings of the Soil Vapor Intrusion sampling, recommended further action has been conducted under a separate IRM as discussed within Section 5.2.

The nature and extent of the soil vapor contamination has been delineated based on the findings of the phased soil vapor intrusion investigations as well as the evaluation of the groundwater plume delineation. Refer to Figure 6 for the extent of the soil vapor intrusion sampling area. Soil Vapor contamination identified during the RI was addressed during the IRM described in Section 5.2.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of soil vapor. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of soil vapor to be addressed by the remedy selection process are, VOCs including TCE, cis-1,2-DCE and VC.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

Mitigation measures were taken at ten residential properties located downgradient of the Site to address current and/or potential indoor air contamination of volatile organic compounds associated with soil vapor intrusion. Continued Monitoring has been recommended for two residential structures and no further action is necessary for the remaining 43 residential structures sampled.

5.3: Summary of Human Exposure Pathways:

This section describes the current or potential human exposures (the way people may come in contact with contamination) that may result from the site contamination. A more detailed discussion of the human exposure pathways can be found in the RI report available at the document repository. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact

with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

At and around the site, people are not drinking the contaminated groundwater because the area is served by a public water supply that obtains its water from a different source. Although the site is not fenced, contact with contaminated soils found on-site is not likely because the contamination is below the ground surface. However, a potential exists for people to be exposed to site-related contaminants as follows:

- People may come into contact with VOCs and contaminated soils and dust if ground-intrusive work is completed on-site.

- Inhalation of VOCs from contaminated groundwater could occur via soil vapor intrusion into the indoor air of the on-site structure. The NYSDOH and NYSDEC have investigated and evaluated the potential for exposures related to soil vapor intrusion in residences off-site, and actions have been taken to minimize or prevent exposure.

- People may come into contact with VOCs in groundwater if contaminated groundwater is present in sump water within their home. However, contact is expected to be minimal (e.g. periodic maintenance of sump pump).

5.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The Fish and Wildlife Impact Analysis (FWIA), which is included within Section 4 of the *Erdle Remedial Investigation Report* (Radian Engineering, June 1995), presents a detailed discussion of the existing and potential impacts from the site poses to fish and wildlife receptors.

Contamination at the Site is related to historical releases to the soil and groundwater from the former TCE UST. Based on samples collected at the Site during the RI and supplemental soil sampling, VOCs exceed the Department SCGs for subsurface soils and groundwater standards. Although there is evidence of soil and groundwater contamination at the site, no endangered, threatened, or rare species are present on the site and no significant fish or wildlife resources are resident within the site property boundaries. Therefore, no direct exposure is anticipated to fish and wildlife receptors.

The facility, located in the southwest corner of a 75-acre industrial park, is bordered on the west by a drainage swale. Wetland forests (non-regulated) and mixed vegetation are located on-site within 0.5 miles to the east and south of the site building. These wetland forests are not anticipated to be

impacted by site contamination as there are no complete environmental exposure pathways from the contaminated subsurface soil or groundwater.

The only potential contaminant migration pathways identified for the site are exposure to surface water and surface soil. However, as described within Section 5 above, surface water and surface soil have not been impacted by site COCs.

The FWIA did not identify any current or potential impacts to ecological resources.

Surface water resources at or near the site include a drainage swale located along the western boundary of the site which drains to the south and eventually discharges into a retention pond located within the Hidden Valley Development. The pond drains to the south and this unnamed stream joins Black Creek approximately 1,300 feet east of the pond. As described within Section 5 above, no current or potential site-related surface water impacts have been identified.

Groundwater resources at the site include overburden and bedrock groundwater. Groundwater at the Site is encountered one to two feet below grade surface (bgs) and shallow bedrock (Onondaga Limestone) at the Site is encountered at seven to 18 feet bgs and determined to be highly fractured and water bearing. Groundwater is interpreted to flow south towards the small pond located in the Hidden Valley Development, although bedrock groundwater is interpreted to have a slight southeasterly flow component and may bypass the pond to the east.

Site related contamination is impacting groundwater. The groundwater is not used as a source of potable water. Protection of the groundwater resource will be addressed in the remedy selection process.

SECTION 6: SUMMARY OF THE REMEDIATION OBJECTIVES

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial objectives for this site are:

Public Health Protection

Groundwater

- Prevent people from drinking groundwater with contaminant levels exceeding drinking water standards.
- Prevent inhalation of contaminants from groundwater.

Soil

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of contaminants volatilizing from the soil.

Soil Vapor

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into the indoor air of buildings at or near a site.

Environmental Protection

Groundwater

- Restore the groundwater aquifer to meet ambient groundwater quality criteria, to the extent feasible.

Soil

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Site were identified, screened and evaluated in the feasibility study which is available at the document repositories established for this site.

A summary of the remedial alternatives that were considered for this site is presented below. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

Although In-Situ Enhanced Biodegradation was evaluated as a remedial alternative for the site within the feasibility study, it was eliminated as a stand-alone remedial alternative primarily due to the high concentration of the target contaminants within the on-site source area. In-situ enhanced biodegradation is generally not implemented as a remedy for source removal since elevated contaminant concentrations may provide a toxic environment not supportive of the necessary microbial populations. However, in-situ enhanced bioremediation was determined to be an appropriate component of other remedial alternatives evaluated for this site as a method of treating residual contamination and/or downgradient groundwater contamination.

7.1: Description of Remedial Alternatives

The following alternatives were considered to address the contaminated media identified at the site as describe in Section 5:

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 5.2. This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

Alternative 2: No Further Action with Site Management

The No Further Action with Site Management Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 5.2 and Site Management and Engineering Controls and Institutional Control is necessary to confirm the effectiveness of the IRM. This alternative maintains engineering controls which were part of the IRM and includes institutional controls, in the form of an environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at the site after the IRMs.

Present Worth: *$694,000*
Capital Cost: *$18,000*
Annual Costs (30 years): *$44,000*

Alternative 3: Restoration to Pre-Disposal Conditions

This alternative achieves all of the SCGs discussed in Section 5.1.1 and soil meets the unrestricted soil cleanup objectives listed in Part 375-6.8 (a). This alternative would include: the excavation and off-site disposal of on-site soil with VOC concentrations greater than or equal to the NYCRR Part 375 unrestricted SCOs, implementation of in-situ enhanced biodegradation during the backfilling of the excavation to address the residual soil and groundwater contamination both on site and immediately downgradient, and off-site groundwater extraction to address the downgradient groundwater plume. Based upon results of soil sampling conducted during the RI, the majority of on-site vadose zone soil to a depth of 3 feet is anticipated to be uncontaminated by site-specific COCs, and would be stockpiled separately from soil located at a depth of 3 feet or deeper and screened for potential use as excavation backfill. Approximately 7,800 cubic yards of contaminated soil would be removed. Clean fill would then be brought in to replace the excavated soil transported off-site for treatment/disposal to establish the designed finish grades. During backfilling, amendments (e.g., vegetable oil) to enhance the biodegradation of residual soil and groundwater contamination would be added to the clean fill. Groundwater extraction wells would be installed across the width of the plume downgradient of the Site to reduce migration of contaminated groundwater beneath the downgradient residential buildings. A facility would be constructed to provide treatment (e.g., carbon adsorption) of the extracted groundwater for up to 20 years.

Present Worth: *$8,845,000*
Capital Cost: *$6,365,000*
Annual Costs (20 years): *$124,000*

Alternative 4: Source Area Excavation and Off-Site Treatment/Disposal

This alternative would include, the excavation and off-site disposal of source area soils

containing VOCs at concentrations greater than or equal to the Protection of Groundwater SCOs. Under this alternative, on-site source area soils which are a continuing source of on-site and off-site groundwater contamination (located both above and below the water table) would be excavated and transported off-site for treatment and/or disposal. Based upon results of soil sampling conducted during the RI, the majority of on-site vadose zone soil to a depth of 3 feet is anticipated to be uncontaminated by site-specific COCs, and would be stockpiled separately from soil located at a depth of 3 feet or deeper and screened for potential use as excavation backfill. Approximately 4,400 cubic yards of contaminated soil would be removed. Clean fill would then be brought in to replace the excavated soil transported off-site for treatment/disposal and to establish the designed finish grades.

In-situ enhanced biodegradation would be implemented if appropriate to remediate site-related groundwater contamination contributing to the existing off-site soil vapor to indoor air pathway. The decision to conduct in-situ enhanced biodegradation during implementation of remedial action would be based upon the information available at that time, including results of the pre-design investigation. Subsequent rounds of in-situ biodegradation would be conducted, as appropriate, based upon evaluation of long-term monitoring results.

Institutional and engineering controls to restrict the land and groundwater use on-site, and prevent indoor air exposure downgradient, respectively, will be implemented as part of this alternative. This remedy could be designed in under a year, and once mobilized to the site, the implementation of the remedy (without the implementation of the in-situ biodegradation) would take approximately three months. It is estimated that if in-situ enhanced biodegradation is implemented that injections and subsequent groundwater plume monitoring would be conducted on a periodic basis.

Present Worth: *$5,569,000*
Capital Cost: *$4,893,000*
Annual Costs (30 years): *$44,000*

Alternative 5: In-Situ Enhanced Soil Mixing

This alternative would include mechanical mixing of the on-site source area soils with zero-valent iron, to provide treatment, and bentonite, to reduce migration of VOC source area soil contamination. It is assumed that zero-valent iron would be added to the source area soils at a weight per weight ratio of 2 percent zero-valent iron/1 percent bentonite. It has been assumed that the bulk density of the soil is 110 pounds per cubic foot. Implementation of this alternative would include mechanical mixing of the on-site source area soils with chemical reagents and/or amendments (i.e., zero-valent iron) to aid in destruction of the VOC contamination within the source area.

In-situ enhanced biodegradation would be implemented if appropriate to remediate site-related groundwater contamination contributing to the existing off-site soil vapor to indoor air pathway. The decision to conduct in-situ enhanced biodegradation during implementation of remedial action would be based upon the information available at that time, including results of the pre-design investigation. Subsequent rounds of in-situ biodegradation would be conducted, as appropriate, based upon evaluation of long-term monitoring results.

Institutional and engineering controls to restrict the land and groundwater use on-site, and prevent indoor air exposure downgradient, respectively, will be implemented as part of this alternative. This remedy could be designed in under a year, and once mobilized to the site, the implementation of the remedy (without the implementation of the in-situ biodegradation) would take approximately three months. It is estimated that if in-situ enhanced biodegradation is implemented that injections and subsequent groundwater plume monitoring would be conducted on a periodic basis.

Present Worth: *$1,907,000*
Capital Cost: *$1,231,000*
Annual Costs (30 years): *$44,000*

Alternative 6: Electrical Resistance Heating

This alternative would include, the implementation of in-situ electrical resistance heating to address on-site VOC soil and groundwater contamination. Implementation of this alternative would consist of the installation of approximately fifty 12-inch diameter electrodes installed throughout the source area on fifteen-foot spacing. Each electrode would also be paired with one vapor recovery extraction well for vapor recovery. The vapor recovery system would utilize a 255 cubic-foot per minute 20 horsepower blower, with vapor phase treatment. The existing electrical utility supply would be adequate to operate the system.

In-situ enhanced biodegradation would be implemented if appropriate to remediate site-related groundwater contamination contributing to the existing off-site soil vapor to indoor air pathway. The decision to conduct in-situ enhanced biodegradation during implementation of remedial action would be based upon the information available at that time, including results of the pre-design investigation and data gathered to evaluate the effectiveness of the electrical resistance heating of the on-site source area. Subsequent rounds of in-situ biodegradation would be conducted, as appropriate, based upon evaluation of long-term monitoring results.

Institutional and engineering controls to restrict the land and groundwater use on-site, and prevent indoor air exposure downgradient, respectively, will be implemented as part of this alternative. This remedy could be designed in approximately two years, and once mobilized to the site, the implementation of the remedy (without the implementation of the in-situ biodegradation) would take approximately one year. It is estimated that if in-situ enhanced biodegradation is implemented that injections and subsequent groundwater plume monitoring would be conducted on a periodic basis.

Present Worth: *$3,173,000*
Capital Cost: *$2,497,000*
Annual Costs (30 years): *$44,000*

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which sets forth the requirements for the remediation of inactive hazardous waste disposal sites in New York. A detailed discussion of the evaluation criteria and comparative analysis is included in the feasibility study.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in the Remedial Alternatives Cost Table 3.

Table 3
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
1. No Further Action	0	0	0
2. No Further Action with Site Management	18,000	44,000	694,000
3. Restoration to Pre-Disposal Conditions	6,365,000	124,000	8,845,000
4. Source Area Excavation and Off-site Treatment/Disposal	4,893,000	44,000	5,569,000
5. In-situ Enhanced Soil Mixing	1,231,000	44,000	1,907,000
6. Electrical Resistance Heating	2,497,000	44,000	3,173,000

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the Department addressed the concerns raised.

In general, the public comments received were supportive of the selected remedy. Several comments were received, however, pertaining to clarification on how the townhouse development (Hidden Valley), located just south of the site, is affected by the contamination coming from the Erdle Perforating site. Those questions were addressed, as documented in the responsiveness summary.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the Department has selected Alternative 6, Electrical Resistance Heating as the remedy for this site. The elements of this remedy are described at the end of this section.

8.1 Basis for Selection

The selected remedy is based on the results of the RI and the evaluation of alternatives.

Alternative 6 is selected because, as described below, it satisfies the threshold criteria and provides the best balance of the balancing criterion described in Section 7.2. It will achieve the remediation goals for the site by permanently reducing the soil contamination through electrical resistance heating of the source area soils. Alternative 6 addresses the source of groundwater contamination, which is the most significant threat to public health and the environment, and it creates the conditions necessary to restore groundwater quality through natural attenuation to the extent practicable (unless in-situ enhanced biodegradation is implemented). This alternative is as effective in the long-term as restoration to pre-disposal conditions, yet will be implemented at a considerably lower cost.

Alternative 1 (No Further Action) does not provide any protection to public health and the environment and will not comply with the SCGs for soil and groundwater and therefore, will not be evaluated further. Alternative 2 (No Further Action with Site Management) will not prevent contamination migration and will rely upon institutional controls to prevent future exposure to site related contamination, and will otherwise not meet the threshold criteria. Alternative 3 (Restoration to Pre-Disposal or Unrestricted Conditions), by removing all soil contaminated above the "Unrestricted" soil cleanup objective, meets the threshold criteria. Compared to Alternative 3, Alternative 4 (Source Area Excavation and Off-Site Treatment/Disposal), Alternative 5 (In-Situ Enhanced Soil Mixing) and Alternative 6 (Electrical Resistance Heating) also comply with the threshold criteria but to a lesser degree or with lower certainty. Because Alternatives 3 through 6 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

Long-term effectiveness is best accomplished by those alternatives involving excavation of the contaminated overburden soils (Alternatives 3 and 4). Alternative 3 will allow for unrestricted use of the Site, but will require the use of engineering controls to prevent potential future groundwater exposure until groundwater SCGs are met. Alternatives 4, 5 and 6 will in the long-term result in similar site-related soil and groundwater contamination reduction as Alternative 3. Alternative 4 will result in the removal of most of the contaminated soil at the site but will rely upon institutional controls to address human health exposure pathways until groundwater SCGs are met. Alternatives 5 and 6 will address the extent of the soil source contamination through in-situ remedial action, but will rely upon institutional controls to address human health exposure pathways until groundwater SCGs are met. For Alternative 2, site management will address human health exposure pathways for groundwater and soil vapor, but it will not address the on-site source area contamination and is therefore not effective in the long-term.

Alternative 2 will control potential exposures with institutional controls only and will not reduce the

toxicity, mobility or volume of contaminants remaining at the site. Alternatives 3 and 4 will result in the reduction of mobility and volume of soil and groundwater contamination at and in the vicinity of the Site through excavation and off-site treatment. Alternatives 5 and 6 will permanently reduce the toxicity, mobility and volume of contaminants by use of in-situ remediation of the soil source area. Alternative 6 includes the implementation of a more effective and reliable remedial technology for reducing toxicity, mobility and volume of the site contamination than Alternative 5.

Alternative 2 will include only the implementation of institutional controls, and will not result in short term adverse impacts and risks to the community, site workers, or the environment. During the implementation of the remedial action, Alternatives 3 through 6 will result in potential short-term adverse impacts and risks to the community, site workers, and the environment. Potential short-term adverse impacts and risks associated with the implementation of Alternatives 3 through 6 could be controlled with the use of appropriate engineering controls and the preparation of and adherence to a comprehensive construction work plan and health and safety plan. Alternative 3 includes both excavation and transportation off-site of contaminated soils from the Site and off-site implementation of groundwater extraction and treatment, presenting the greatest potential short-term risks to the community. Alternative 4 includes the excavation and transportation off-site of source area soils, and will therefore present a greater potential short-term risk. Alternatives 5 and 6, which consist primarily of in-situ treatment, will provide the least disturbance of contaminated soils, and therefore present the least potential short-term adverse impacts and risks to the community, site workers, and the environment. It is estimated that the on-site soil source remedial action for Alternatives 3 through 6 could be fully implemented in less than one year.

Alternative 2 includes only the implementation of institutional controls, and therefore is favorable in that it is readily implementable. Alternatives 3 and 4 are also implementable, but will involve increased truck traffic on local roads for several weeks to months, with alternative 3 taking the longest time to complete the excavation of soil. There will be technical issues with implementing Alternatives 3, 4, 5, and 6, associated primarily with addressing contamination present beneath the site building. These alternatives may not be capable of providing remediation of this contamination in the short-term, and Alternative 4 will primarily rely upon natural attenuation of this contamination, while Alternative 5 will rely upon long-term remediation of this contamination using in-situ treatment amendments. Relative to the other alternatives evaluated, Alternative 6 is the only remedial alternative with the potential to provide reduction of VOC contamination beneath the site building through the anticipated zone of influence of the in-situ electrical resistance heating system. Alternatives 3, 4, and 5 may also be difficult to implement due the shallow water table which may impact the use of heavy equipment at the Site during remediation, which consists of either the excavation of saturated zone soils or mechanical mixing of saturated zone soils, respectively.

The costs of the alternatives vary significantly. Alternative 2 has a low cost, but the contaminated soil will not be addressed other than by institutional controls. With the large volume of soil to be handled, Alternatives 3 and 4 (excavation and off-site disposal) will have the highest present work costs. Electrical Resistance Heating (Alternative 6) will be much less expensive than Alternatives 3 and 4, yet it will provide equal protection of the groundwater resource. The cost of Alternatives 5 is lower than 3,4 and 6, although it is a less effective and less reliable remedial technology. The past remedial efforts at this site included an in-situ SVE system which proved to be ineffective due to the poor communication of the on-site glacial till subsurface geology within the vicinity of the soil

source area. The effectiveness of Alternative 5 could also prove to be difficult based on the glacial till subsurface geology within the vicinity of the soil source area, whereas Alternative 6 benefits from dense soil as the conductivity of the electrical current increases within glacial till.

Alternatives 4 and 5 will be less desirable because residual soil contamination will remain on the property, whereas Alternatives 3 and 6 will remove or treat the contaminated soil source area permanently. However, the residual contamination with Alternatives 4 and 5 will be controllable with implementation of Institutional Controls and a Site Management Plan. With Alternative 3, the excavation and off-site disposal of soil exceeding unrestricted SCGs will result in most of the unsaturated overburden being removed and restrictions on the site use will not be necessary.

The estimated present worth cost to implement the remedy is $3,173,000. The cost to construct the remedy is estimated to be $2,497,000 and the estimated average annual costs for 30 years is $44,000. Costs estimated for the remedy include the implementation of in-situ enhanced biodegradation, which will be implemented if appropriate to remediate site-related groundwater contamination contributing to the existing off-site soil vapor to indoor air pathway.

8.2 **Elements of the Selected Remedy**

The elements of the selected restricted use remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance and monitoring of the remedial program.

2. The selected remedy includes the implementation of a full-scale in-situ electrical resistance heating system to address on-site VOC soil and groundwater contamination. Implementation of this alternative will consist of the installation of electrodes throughout the source area on approximately fifteen-foot spacing. Each electrode will be paired with one vapor recovery extraction well for vapor recovery. The vapor recovery system will include vapor phase treatment. Refer to Figure 7 for an illustration of the proposed layout of the electrical resistance heating system.

3. In-situ enhanced biodegradation could be implemented, if appropriate, to remediate site-related groundwater contamination contributing to the existing off-site soil vapor to indoor air pathway. The decision to conduct in-situ enhanced biodegradation during implementation of remedial action will be based upon the information from the Remedial Investigation, results of the pre-design investigation and data gathered to evaluate the effectiveness of the electrical resistance heating of the on-site source area. Full-scale implementation of in-situ enhanced biodegradation will consist of the injection of the selected amendment(s) into the contaminated overburden and shallow bedrock aquifers along two separate horizontal transects; transecting the groundwater plume at locations MW-7/7D and MW-8/8D. The installation of injection points as permanent wells will allow for multiple rounds of injection without the need for mobilization of heavy equipment, and will also provide additional locations to monitor groundwater conditions. Subsequent rounds of in-situ biodegradation will be conducted, as appropriate, based upon evaluation of

groundwater and vapor monitoring results. Refer to Figure 8 for an illustration of the proposed layout of the in-situ enhanced biodegradation injection transects.

4. Site restoration will include placing topsoil and seed over areas disturbed during the installation and removal of the in-situ electrical resistance heating system.

5. The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

6. Green remediation and sustainability efforts are considered in the design and implementation of the remedy to the extent practicable, including;
   - using renewable energy sources through the purchase of electricity generated by renewable sources.

7. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

   (a) requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).
   (b) land use is subject to local zoning laws, the remedy allows the use and development of the controlled property for:
   __residential use __restricted residential use **X** commercial use _industrial use
   (c) restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH;
   (d) requires compliance with the Department approved Site Management Plan;

8. Since the remedy results in contamination remaining at the site that does not allow for unrestricted use, a Site Management Plan is required, which includes the following:

   (a) a Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

      Institutional Controls:
      To prevent exposure to contamination in groundwater until SCGs are met, institutional controls will include the implementation of land-use restrictions as set for the in Paragraph 9 above.

Engineering Controls:
The soil vapor mitigation systems, as discussed in Paragraph 5 above, will be in place and maintained to mitigate soil vapor intrusion in impacted properties.

This plan includes, but may not be limited to:

(i) Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
(ii) descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
(iii) provisions for the management and inspection of the identified engineering controls;
(iv) maintaining site access controls and Department notification; and
(v) the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls;

(b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but will not necessarily be limited to:

(i) monitoring of groundwater to assess the performance and effectiveness of the remedy; monitoring will consist of the sampling and analysis of both on-site and off-site groundwater monitoring wells for VOCs until remediation goals are achieved; it is assumed that long-term monitoring will be conducted on a periodic basis;
(ii) a schedule of monitoring and frequency of submittals to the Department;
(iii) provision to evaluate the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified;
(iv) provision to evaluate the potential for soil vapor intrusion for the existing on-site building if building use changes significantly or if a vacant building becomes occupied.

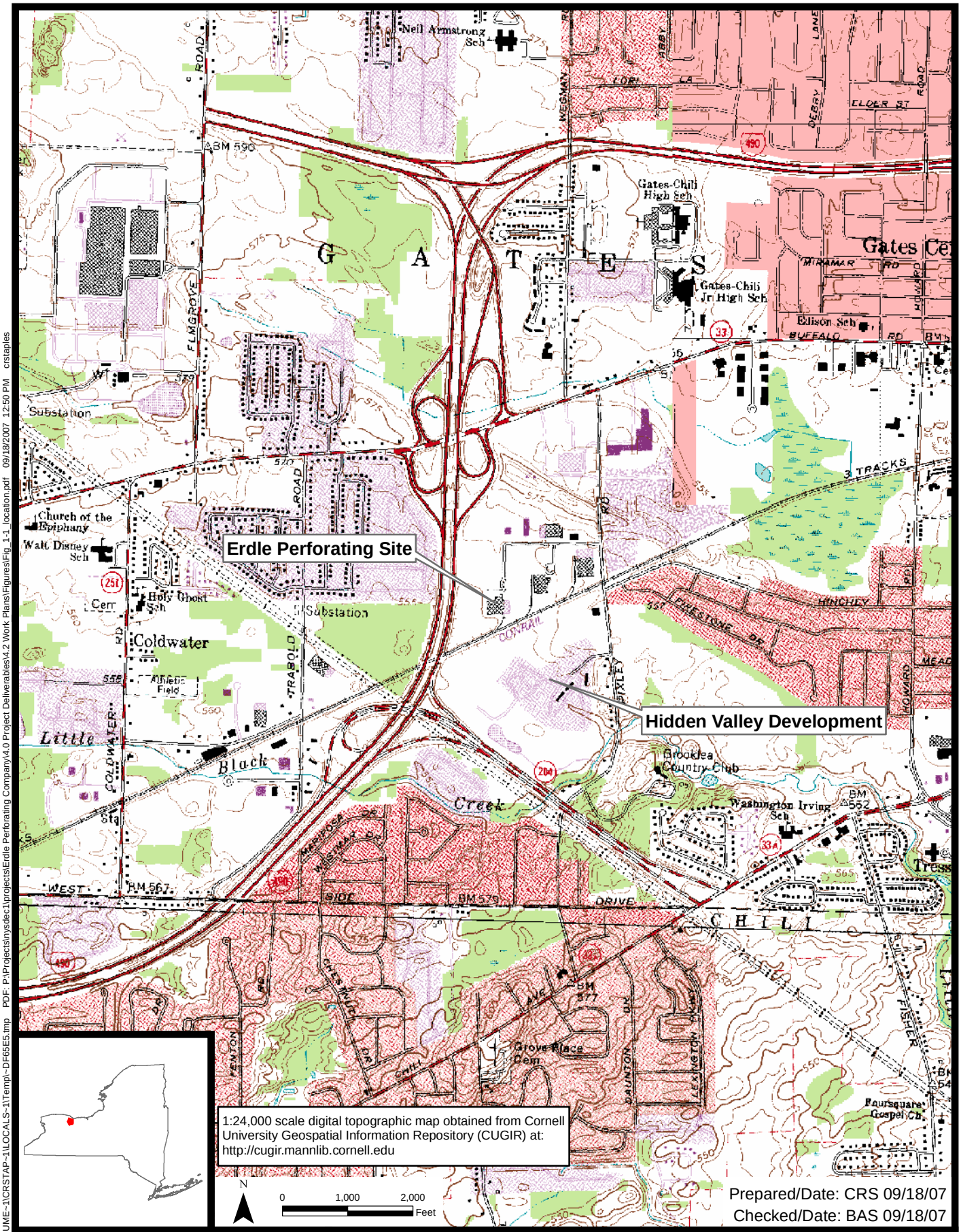
(c) an Operation and Maintenance Plan to assure continued operation, maintenance, monitoring, inspection, and reporting of for any mechanical or physical components of the remedy. The plan includes, but is not limited to:

(i) compliance monitoring of treatment systems to assure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
(ii) maintenance and any necessary installation of soil vapor mitigation systems for residential structures to mitigate the soil vapor intrusion;
(iii) maintaining site access controls and Department notification; and
(vi) providing the Department access to the site and O&M records.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

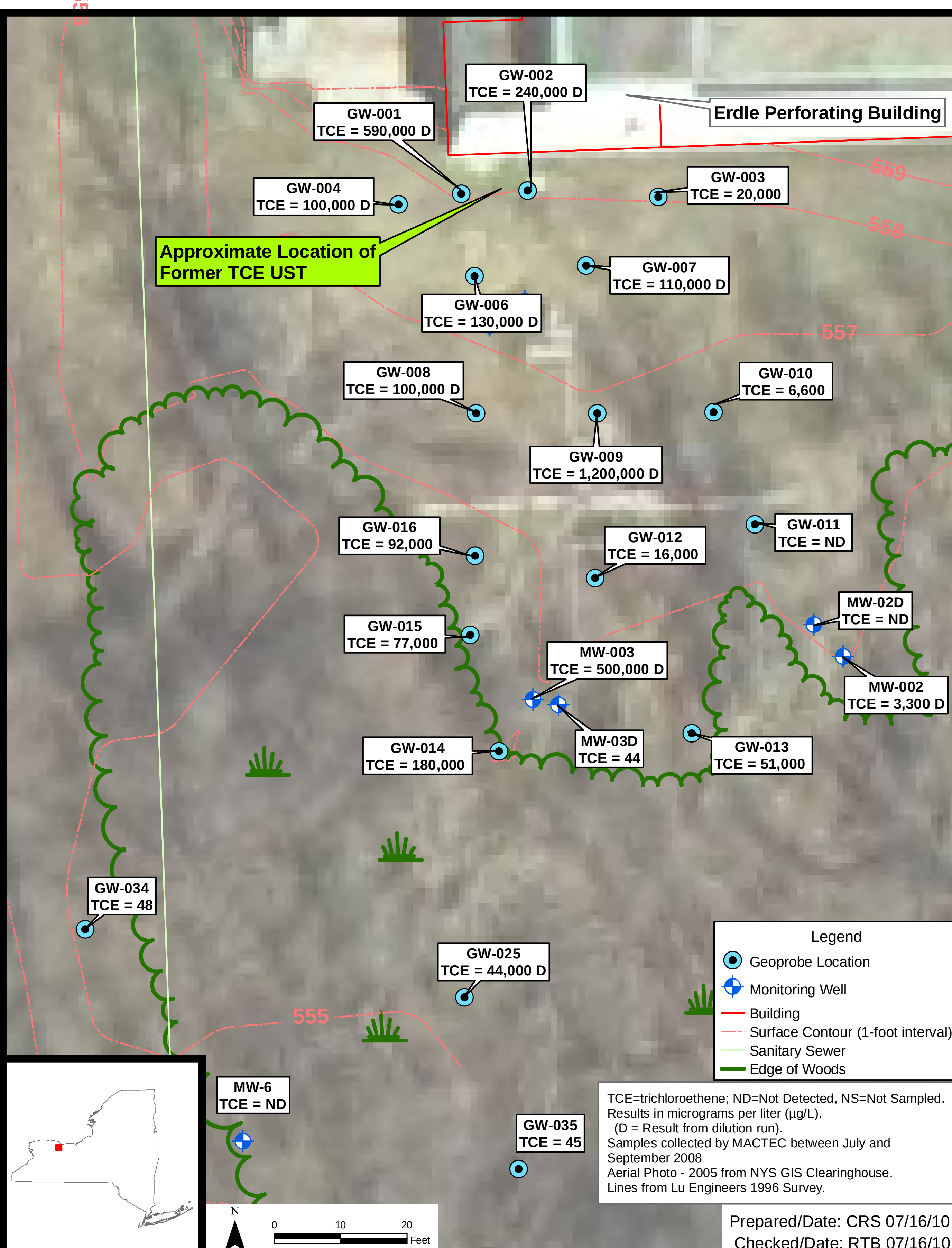
- Repositories for documents pertaining to the site were established.
- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.
- A Fact Sheet was sent in August 2007 which included a soil vapor intrusion investigation update and an announcement for the September 19, 2007 availability session and the September 20, 2007 public meeting, held to present information on the soil vapor intrusion investigation and to answer questions.
- As discussed in the previous bulleted item, an availability session was held on September 19, 2007 and a public meeting was held on September 20, 2007.
- A Fact Sheet was sent in August 2010 to summarize the proposed remedial action (PRAP) for the site and to announce the September 22, 2010 public meeting.
- A public meeting was held on September 22, 2010 to present, and receive comments on the PRAP.
- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.



NYSDEC
Erdle Perforating Company
Gates, New York

MACTEC

Site Location
Project 3612-07-2094
Figure 1



Prepared/Date: CRS 07/16/10
Checked/Date: RTB 07/16/10

NYSDEC
Erdle Perforating Company
Gates, New York

MACTEC

Source Area Groundwater Results - TCE
Project 3612-07-2094
Figure 2

Document: P:\Projects\nysdec1\projects\Erdle Perforating Company\4.0 Project Deliverables\4.5 Databases\GIS\Map_Documents\Erdle_IRM.mxd PDF: P:\Projects\nysdec1\projects\Erdle Perforating Company\4.0 Project Deliverables\4.1 Reports\RI-FS Report\Final RI-FS Report\Revised Final RI-FS e doc deliverable\Fig 4.2 IRM_Groundw

MW-5	
TCE	1 U
Cis-1,2-DCE	0.49 J
VC	0.26 J
MW-5D	
TCE	0.41 J
Cis-1,2-DCE	1 U
VC	1 U

MW-1DD	
TCE	1 U
Cis-1,2-DCE	1 U
VC	1 U

MW-1D	
TCE	190 D
Cis-1,2-DCE	180
VC	11

MW-3D	
TCE	17
Cis-1,2-DCE	47
VC	5.6

MW-2D	
TCE	0.38 J
Cis-1,2-DCE	20
VC	1.6

MW-6	
TCE	1 U
Cis-1,2-DCE	1.2
VC	1 U

MW-7	
TCE	1 U
Cis-1,2-DCE	0.45 J
VC	1 U
MW-7D	
TCE	4.3
Cis-1,2-DCE	2.1
VC	1 U

MW-10	
TCE	1 U
Cis-1,2-DCE	1 U
VC	1 U

MW-6D	
TCE	310 D
Cis-1,2-DCE	220 D
VC	16

GPZ-5S	
TCE	68
Cis-1,2-DCE	68
VC	1 U

GPZ-6S	
TCE	1 U
Cis-1,2-DCE	1 U
VC	1 U
GPZ-6D	
TCE	19
Cis-1,2-DCE	120
VC	27

MW-9	
TCE	38
Cis-1,2-DCE	57
VC	4.2
MW-9D	
TCE	44
Cis-1,2-DCE	14
VC	0.88 J

MW-8	
TCE	870
Cis-1,2-DCE	1700 D
VC	43

GPZ-5D	
TCE	320 D
Cis-1,2-DCE	150
VC	5.8

MW-8D	
TCE	590 D
Cis-1,2-DCE	330 D
VC	20

MW-12	
TCE	1 U
Cis-1,2-DCE	1 U
VC	1 U

GPZ-2S1	
TCE	1 U
Cis-1,2-DCE	0.32 J
VC	1 U
GPZ-2D	
TCE	1 U
Cis-1,2-DCE	1 U
VC	1 U

GPZ-1S1	
TCE	1 U
Cis-1,2-DCE	1 U
VC	1 U
GPZ-1D	
TCE	39
Cis-1,2-DCE	46
VC	23

MW-11	
TCE	1 U
Cis-1,2-DCE	14
VC	19
MW-11D	
TCE	520 D
Cis-1,2-DCE	490 J
VC	34 J

MW-17	
TCE	1 U
Cis-1,2-DCE	1 U
VC	1 U
MW-17D	
TCE	0.61 J
Cis-1,2-DCE	15
VC	7.8

MW-13		MW-13D		MW-13DD	
TCE	0.71 J	TCE	19	TCE	37
Cis-1,2-DCE	1 U	Cis-1,2-DCE	42	Cis-1,2-DCE	35
VC	1 U	VC	3.4	VC	1.7

MW-16	
TCE	1 U
Cis-1,2-DCE	1 U
VC	1 U

MW-14	
TCE	18
Cis-1,2-DCE	50
VC	3.3
MW-14D	
TCE	45
Cis-1,2-DCE	25
VC	1.5

MW-15	
TCE	33
Cis-1,2-DCE	170
VC	11
MW-15D	
TCE	410
Cis-1,2-DCE	260
VC	15

MW-18	
TCE	0.92 J
Cis-1,2-DCE	380 D
VC	18
MW-18D	
TCE	26
Cis-1,2-DCE	280
VC	19

MW-19	
TCE	1 U
Cis-1,2-DCE	0.56 J
VC	0.27 J
MW-19D	
TCE	1 U
Cis-1,2-DCE	4.7
VC	10

Notes:
TCE = trichloroethene, cis-1,2-DCE = cis-1,2-dichloroethene, VC = vinyl chloride
Results in µg/L; U = not detected, J = estimated value, D= result from diluted run.
Monitoring Wells surveyed by Popli Design Group and water samples collected by MACTEC week of 1/14/08.
Aerial photo - 2005 from NYS GIS Clearing House.
Property lines, Roads, and Sewers from Monroe County database.

N

0 100 200 Feet

Legend

- Monitoring Well
- Sewer Lines
- Interpreted Extent of Exceedance of Groundwater Standards (for TCE, cis-1,2-DCE, and Vinyl Chloride)

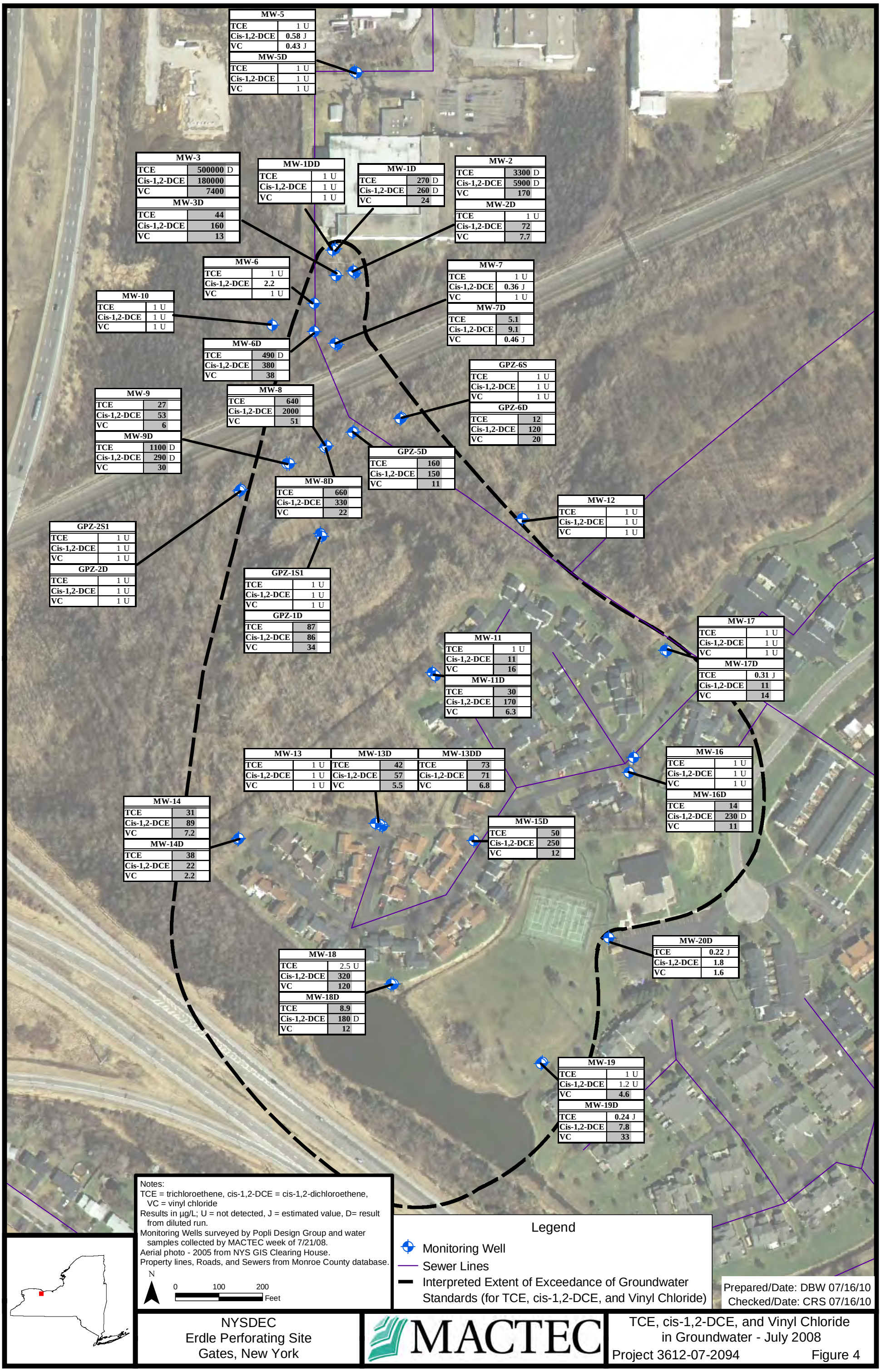
Prepared/Date: DBW 06/16/10
Checked/Date: CRS 06/16/10

NYSDEC
Erdle Perforating Site
Gates, New York

MACTEC

TCE, cis-1,2-DCE, and Vinyl Chloride in Groundwater - January 2008
Project 3612-07-2094 Figure 3

Document: P:\Projects\nysdec1\projects\Erdle Perforating Company\4.0 Project Deliverables\4.1 Reports\RI-FS Report\Figures\Fig 4.3 VOCs in GW Jan 2008.pdf 06/16/2010 9:15 AM crstaples
PDF: P:\Projects\nysdec1\projects\Erdle Perforating Company\4.0 Project Deliverables\4.5 Databases\GIS\Map_Documents\Erdle_GW_analytical.mxd



Notes:
TCE = trichloroethene, cis-1,2-DCE = cis-1,2-dichloroethene, VC = vinyl chloride
Results in µg/L; U = not detected, J = estimated value, D= result from diluted run.
Monitoring Wells surveyed by Popli Design Group and water samples collected by MACTEC week of 7/21/08.
Aerial photo - 2005 from NYS GIS Clearing House.
Property lines, Roads, and Sewers from Monroe County database.

N
0 100 200
Feet

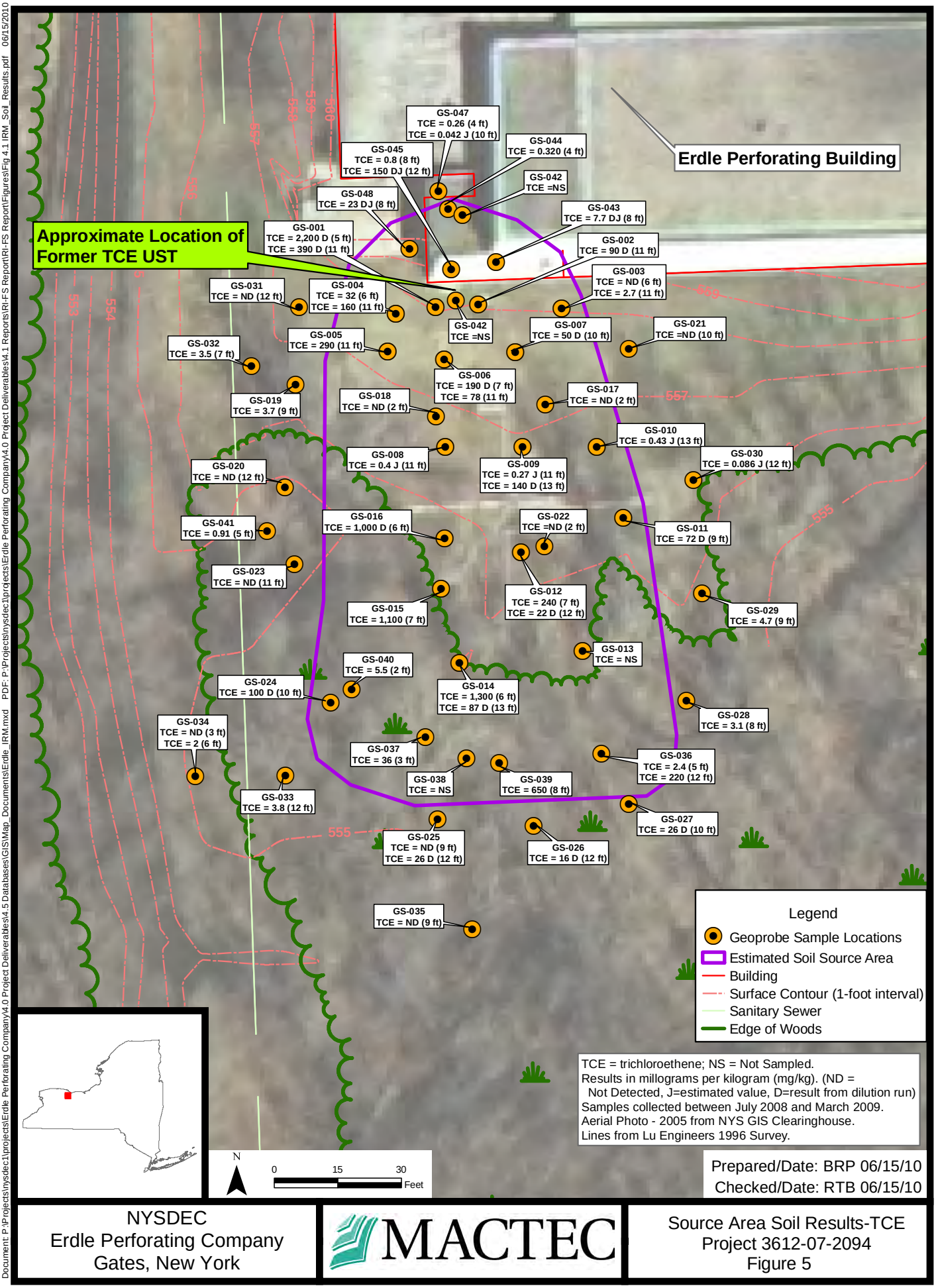
Legend
- Monitoring Well
- Sewer Lines
- Interpreted Extent of Exceedance of Groundwater Standards (for TCE, cis-1,2-DCE, and Vinyl Chloride)

Prepared/Date: DBW 07/16/10
Checked/Date: CRS 07/16/10

NYSDEC
Erdle Perforating Site
Gates, New York

MACTEC

TCE, cis-1,2-DCE, and Vinyl Chloride in Groundwater - July 2008
Project 3612-07-2094 Figure 4



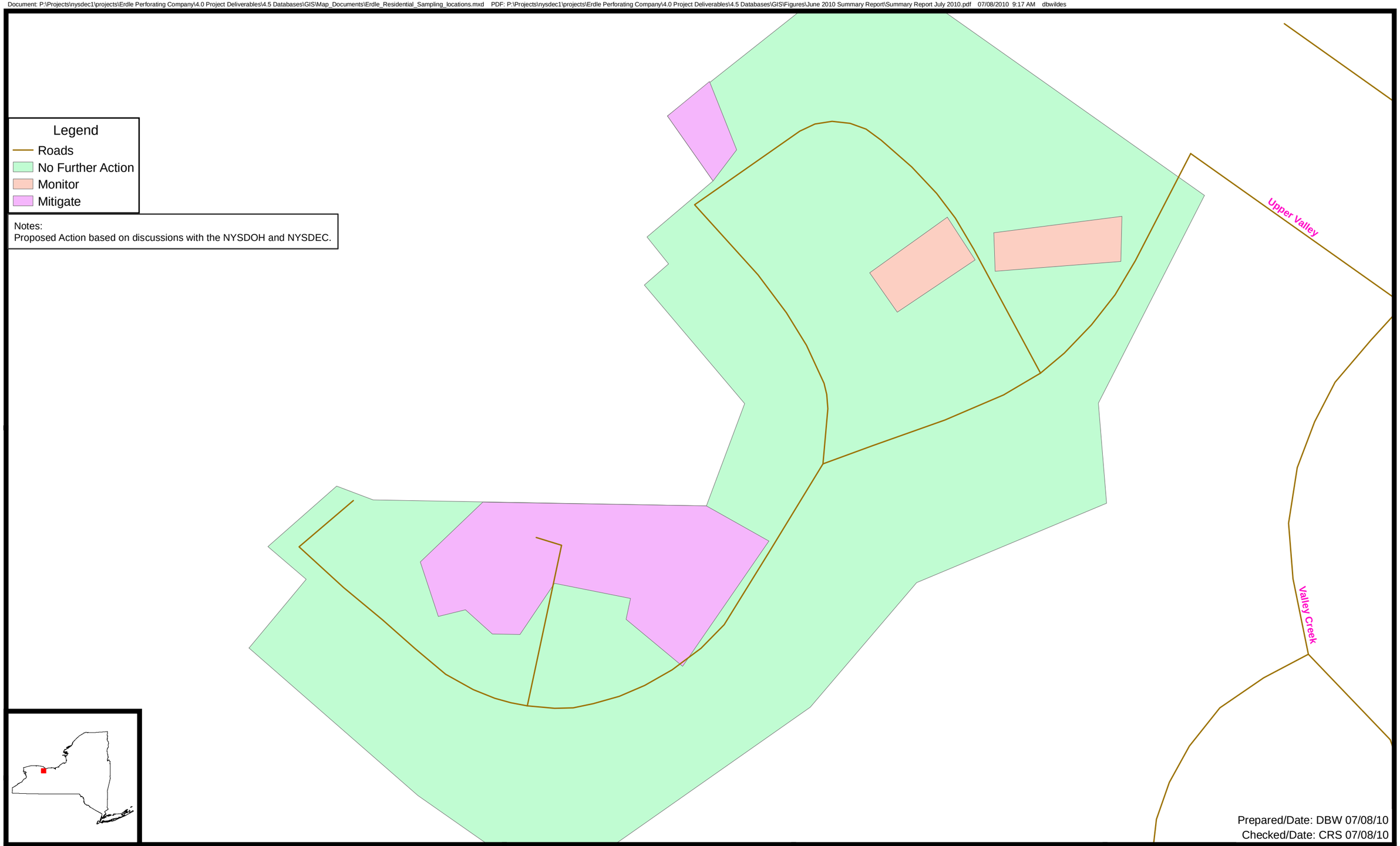
TCE = trichloroethene; NS = Not Sampled.
Results in milligrams per kilogram (mg/kg). (ND = Not Detected, J=estimated value, D=result from dilution run)
Samples collected between July 2008 and March 2009.
Aerial Photo - 2005 from NYS GIS Clearinghouse.
Lines from Lu Engineers 1996 Survey.

Prepared/Date: BRP 06/15/10
Checked/Date: RTB 06/15/10

NYSDEC
Erdle Perforating Company
Gates, New York

MACTEC

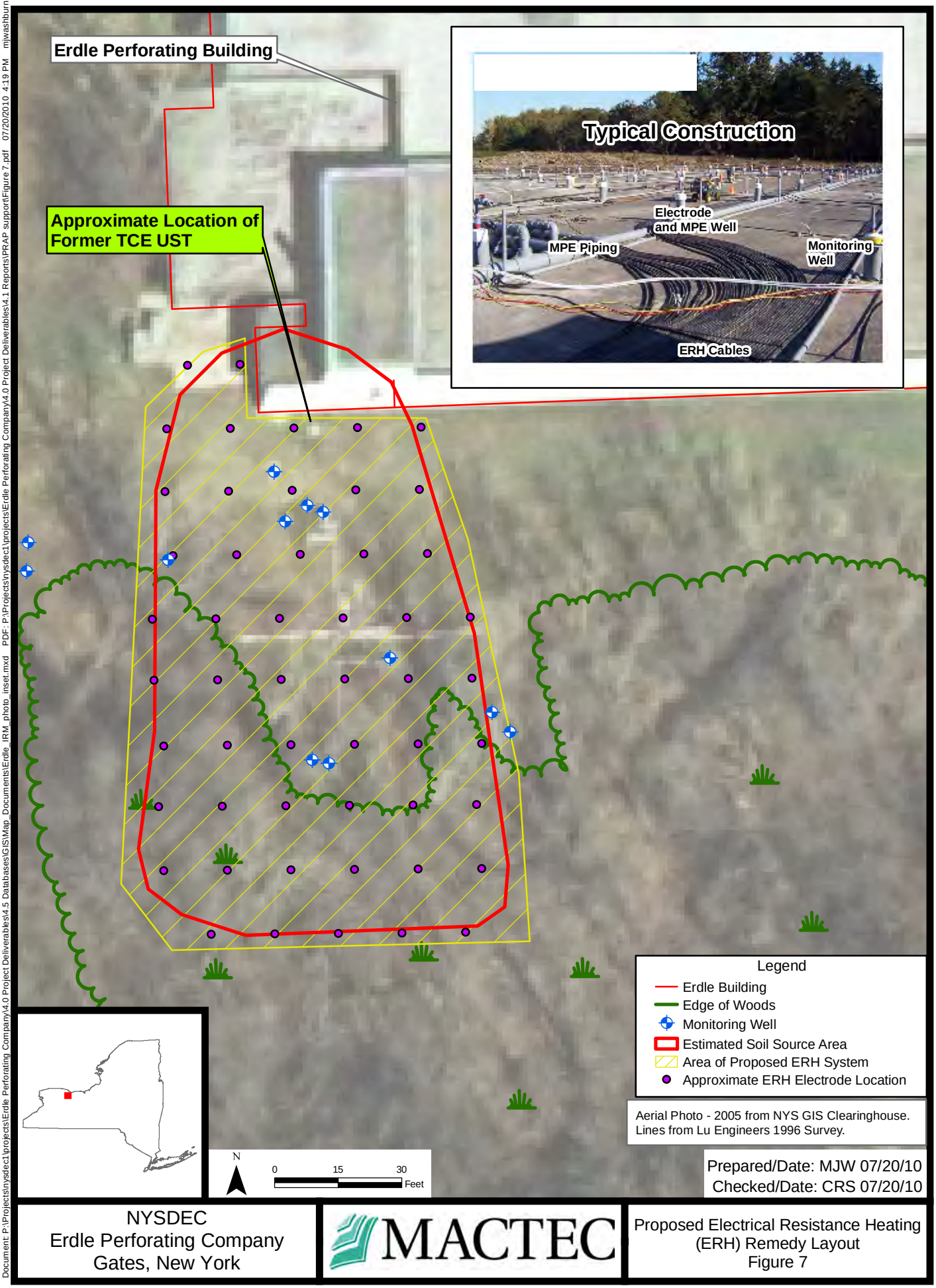
Source Area Soil Results-TCE
Project 3612-07-2094
Figure 5



NYSDEC
Erdle Perforating Site
Gates, NY

MACTEC

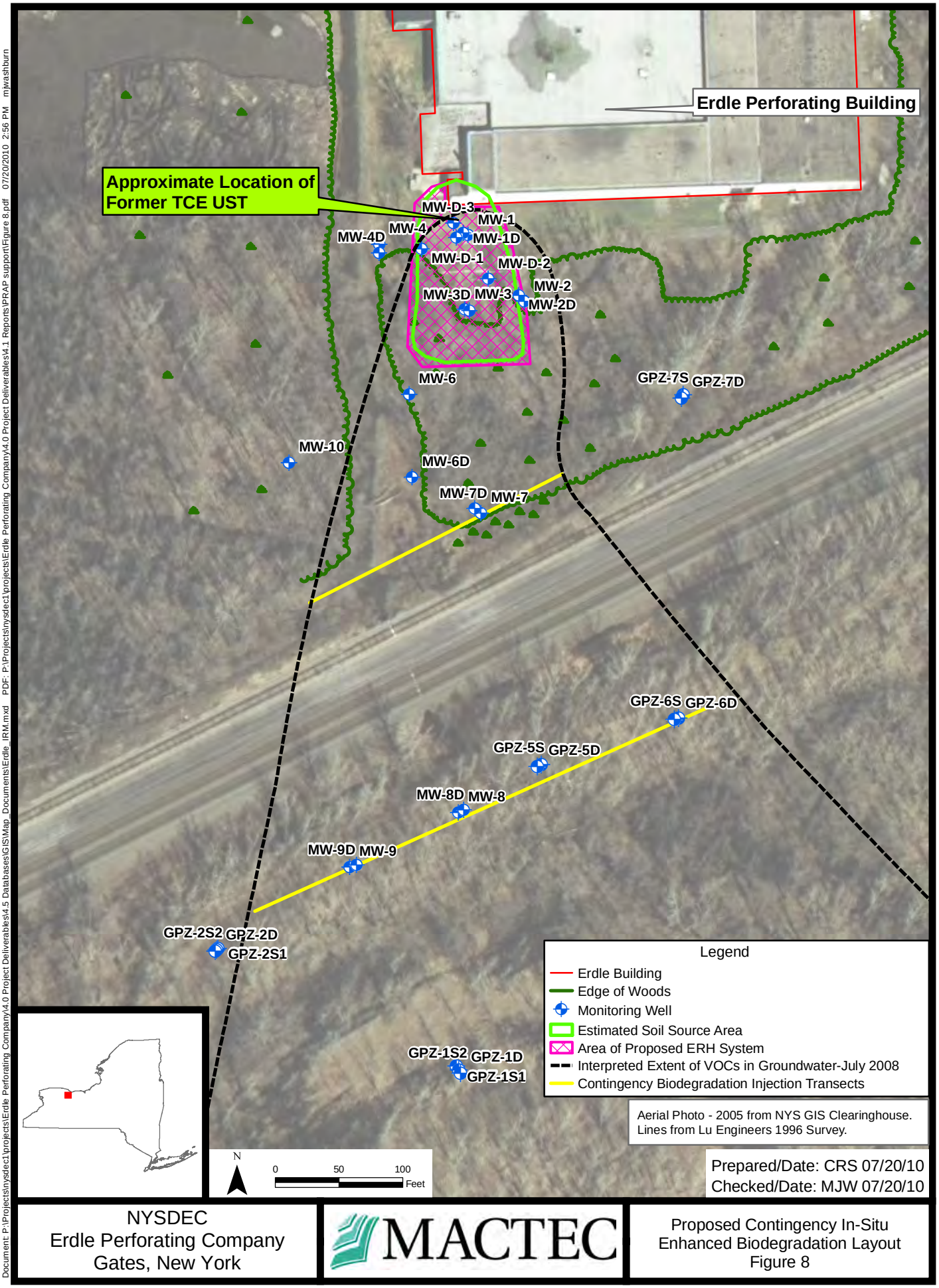
Residential Sampling Area
and Proposed Actions
Project 3612-07-2094 Figure 6



NYSDEC
Erdle Perforating Company
Gates, New York

MACTEC

Proposed Electrical Resistance Heating (ERH) Remedy Layout
Figure 7



NYSDEC
Erdle Perforating Company
Gates, New York

MACTEC

Proposed Contingency In-Situ Enhanced Biodegradation Layout
Figure 8

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APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Erdle Perforating Site
State Superfund Project
Town of Gates, Monroe County, New York
Site No. 828072

The Proposed Remedial Action Plan (PRAP) for the Erdle Perforating site, was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on August 31, 2010. The PRAP outlined the remedial measure proposed for the contaminated soil, groundwater and soil vapor at the Erdle Perforating site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on September 22, 2010, which included a presentation of the remedial investigation/feasibility study (RI/FS) for the Erdle Perforating site as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on October 4, 2010.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's responses:

COMMENT 1: Where is the contamination coming from? Is it still coming? Could it still spread further?
RESPONSE 1: The contamination is present in the on-site subsurface soils that were contaminated as the result of a former underground storage tank which leaked trichloroethene (TCE) and which was removed in 1987. The contaminated subsurface soils continue to act as a source of contamination to the groundwater. The limits of the groundwater plume have been defined and the plume is not spreading any further. Further, this soil contamination will be addressed by the implementation of the remedy for this site.

COMMENT 2: Was there a spill at Erdle in 1987? Was proper notification and hazmat response done at that time? Was containment done, and studies like you're doing performed? Did they check down every 5 feet? Is the contamination less volatile in a liquid state? Did Erdle use the contamination as a cleaning agent?

RESPONSE 2: The leaking underground storage tank was discovered in 1987 when the waste disposal contractor emptied the tank and discovered water in the tank. A pressure test was conducted to test the integrity of the tank and when it failed the pressure test Erdle notified the Department. Erdle then removed the tank and approximately 100 cubic yards of contaminated soils around it. The situation was handled as a spill; it is assumed they removed visually contaminated soil and in places excavated down to bedrock. In 1992 Erdle followed up with a

groundwater investigation that indicated the continued presence of contamination in the groundwater.

As far as the contaminants volatility, that is based on the chemical properties of the compound (boiling point) which does not change based on the state of the compound.

And finally, Erdle used the contaminant during its manufacturing process to remove perforating oils.

COMMENT 3: Do you have an estimate on how many gallons leaked from the tank? How big was the tank, what was the capacity of the tank? Was it a 3,000 gallon tank?
RESPONSE 3: When Erdle discovered the tank was leaking there was no way of knowing how long it had been leaking. Erdle was collecting waste TCE so it is unclear if they were monitoring the exact volume going into the tank versus what was being emptied from the tank for off-site disposal. Looking back at July 1987 Underground Tank and Soil Excavation Report, the waste TCE tank was estimated to have a volume of approximately 2,000 gallons.

COMMENT 4: Why did the tank leak—didn't they notice it wasn't a bottomless tank? Did Erdle keep filling it and filling it? Did they ever empty the tank?
RESPONSE 4: The tank was not used to store product used in the building, it was used to collect waste TCE; occasionally the tank was emptied and the material was disposed of off-site.

COMMENT 5: Does the contaminated groundwater affect the pool at Hidden Valley?
RESPONSE 5: No, groundwater does not affect the pool at the development. There is some contaminated groundwater which flows under part of the development, and some of it may discharge to the pond at the south end of the development, however the pool is not connected to the groundwater system and it is filled from the municipal water supply.

COMMENT 6: What are the readings at the pond?
RESPONSE 6: Five surface water samples were collected by the Monroe County Health Department in 2007. These samples were collected from sump outfalls, drainage ditches and from the pond located at the south end of the Hidden Valley development. None of the results from these surface water samples exceeded the surface water quality standards, indicating that surface water downgradient of the Erdle site has not been impacted by contamination from the site.

COMMENT 7: Is wildlife affected around the pond area? I'm concerned about the wildlife, birds, beavers that are there.
RESPONSE 7: The Division of Fish, Wildlife and Marine Resources at the Department has reviewed the data relative to the wetlands area and has concluded that the volatile organic compounds will have any significant impacts to wildlife.

COMMENT 8: Is there only one plume?
RESPONSE 8: There is only one plume, however the contamination is present in both the overburden and the shallow bedrock groundwater, as shown in the figures in the Remedial

Investigation (RI) Report and the PRAP. The overburden groundwater is moving to the south and the shallow bedrock groundwater is moving to the south-southeast.

COMMENT 9: Is the plume in the wetland?
RESPONSE 9: The contamination from the site is not in the wetland; but passes under the area located to the south of the site between the site and the Hidden Valley development.

COMMENT 10: Are there sampling points outside the plume area? Did you sample outside the plume?
RESPONSE 10: Groundwater sampling points were installed to define the extent of the plume. If the analysis of groundwater samples indicated that contaminant concentrations were at, or near groundwater standards, no additional monitoring wells were necessary further downgradient.

COMMENT 11: How high were the highest levels or numbers for groundwater and air?
RESPONSE 11: At the site, the highest groundwater concentrations were in the hundreds of parts per million. At the Hidden Valley development the highest concentrations were in the tens of parts per billion (one part per million = 1,000 parts per billion). The highest concentrations in indoor air samples at the Hidden Valley development were in the hundreds of micrograms per cubic meter range, but most of the concentrations were lower than that level. See the ROD and the RI Report for a more detailed discussion of the levels.

COMMENT 12: Are you confident that the plume does not extend further south and east?
RESPONSE 12: Yes. We know where the source is, and we have groundwater monitoring wells in-place that define the extent of the plume where groundwater concentrations are at, or near groundwater standards.

COMMENT 13: Is the plume getting bigger or is it stabilized?
RESPONSE 13: The size and limits of the plume have stabilized, as shown on figures in the RI Report and in the ROD. Once the on-site source area is remediated the size of the plume is expected to decrease.

COMMENT 14: Is the groundwater plume the sole source of this contamination? Are any other Pixley Road industries responsible for groundwater contamination?
RESPONSE 14: Based on upgradient and downgradient sampling conducted at/near the site, the Erdle site is the source of the volatile organic contamination.

COMMENT 15: Will the heat turn the liquid into vapors? How well will you capture the contamination with the heat treatments?
RESPONSE 15: Once the soils are heated the volatile organic contamination will essentially boil off. The heat will be generated by passing electricity through the soil between the electrodes. The treatment area will be covered by plastic sheeting to contain the vapors and the vapors that are generated will be removed from the soils through soil vapor extraction points. These extraction points will be installed at each location where an electrode will be installed. The collected vapor will be treated.

COMMENT 16: During the summer when its 90 degrees, is it tougher to do the heat treatment in the summertime versus doing it in the fall or wintertime?
RESPONSE 16: The subsurface temperatures are fairly constant so the air temperature will have little to no effect on the electrical resistance heating (ERH) system.

COMMENT 17: When will you start this?
RESPONSE 17: The Record of Decision will be issued in December 2010, then the remedy will need to be designed before it can be constructed. It is anticipated that the design could be performed during 2011 and the remedy could be constructed as soon as the 2012 construction season providing funding is available at that time.

COMMENT 18: How deep are the electrodes going?
RESPONSE 18: The electrodes will be installed down to bedrock, generally between 10 and 15 feet below the ground surface.

COMMENT 19: Will underground utilities and pipes in the development be affected by the soil remediation?
RESPONSE 19: No. The ERH soil treatment system will be installed at the site, adjacent to the southwest corner of the Erdle Perforating building. The soil contamination is present at the Erdle site and not at the Hidden Valley development. Soil remediation is not necessary at Hidden Valley and thus will not impact underground utilities in the development.

COMMENT 20: Will this cleanup take place at Hidden Valley or at Erdle?
RESPONSE 20: See response #19.

COMMENT 21: Are deed restrictions on or off site? Are there any at Hidden Valley?
RESPONSE 21: An Environmental Easement will be placed on the Erdle Perforating site property only.

COMMENT 22: Will you be using the same type of system that was used in Brockport, at the Kleen Brite site?
RESPONSE 22: No, **t**he ERH technology proposed at the Erdle site is relatively "compact", and limited to the area around the SW corner of the Erdle building. The ERH system should only take a matter of months to accomplish the cleanup of the contaminated soil.

COMMENT 23: Are cleanup monies coming from State Superfund? Isn't that fund out of money?
RESPONSE 23: The project is being funded, and will continue to be funded by the State Superfund. The Superfund is presently funded by an annual appropriation.

COMMENT 24: Where are the injections going and what will be injected?
RESPONSE 24: A figure is included in the ROD which shows, conceptually, where the enhanced bioremediation injections into the groundwater will take place, if necessary. Once the source area soil remedy (ERH) has been completed, additional sampling will be conducted to evaluate conditions and characterize the remaining groundwater contamination. At that time, the in-situ enhanced bioremediation system will be designed. Depending on the information

gathered, either more microbes (commonly referred to as “bugs”) and/or food for the bugs will be injected, or if enough bugs are already present, just food for the bugs will be injected to enhance the naturally occurring degradation.

COMMENT 25: Is Erdle still in business?
RESPONSE 25: Yes.

COMMENT 26: Is Erdle paying for this cleanup?
RESPONSE 26: Erdle entered into a legal agreement (Consent Order) with the Department in 1994 and performed some work under that Order. In 2006 Erdle was determined to be in violation of the Order and the site was referred to the State Superfund. The Department has the ability to seek recovery for the costs incurred by the State on the project.

COMMENT 27: Were Upper Valley Road homes affected by this?
RESPONSE 27: The groundwater contamination from the site has migrated to the south, under some of the homes located on Upper Valley Road. Indoor air samples were collected from homes in that area as a part of the Vapor Intrusion Study. A total of 55 homes were sampled as a part of the Vapor Intrusion Study. Of the 55 homes sampled, vapor mitigation systems were installed in 10 of them, 2 homes will have continued monitoring conducted, and no further action was recommended for 43 homes.

COMMENT 28: How many ppm of TCE are coming into the homes?
RESPONSE 28: Results for air samples are generally reported in units of micrograms of contaminant per cubic meter of air. The highest concentration of TCE found in indoor air samples taken in the Hidden Valley development was about 20 micrograms per cubic meter. As a frame of reference, the guideline for TCE in air, developed by the New York State Department of Health, is 5 micrograms per cubic meter (the purpose of a guideline is to help guide decisions about the nature of efforts to reduce exposure to the chemical). This guideline is lower than the air levels that caused either non-cancer or cancer effects.

COMMENT 29: Are you telling us the systems in the homes are not working?
RESPONSE 29: No, the mitigation systems are working. We installed the mitigation systems in homes where sample results indicated that actual exposure or a potential for individuals to be exposed existed. Recommendations were determined based on an evaluation of the soil vapor intrusion sample results, from each home, relative to the Soil Vapor/Indoor Air Matrices present in the New York State Guidance for Evaluating Soil Vapor Intrusion and in conjunction with sampling results from other homes located in the neighborhood and environmental samples collected near the home.

COMMENT 30: Will monitoring go on forever?
RESPONSE 30: Monitoring of the remedial systems at the site will continue until the remedial goals have been met.

COMMENT 31: Are there legal issues needed for property sales because of this? If you have one of these systems in your basement, do you need to report it when you sell your home? Do

we need to tell buyers about his when selling our homes, even if we do not have a system in our basement?
RESPONSE 31: We are aware of real estate disclosure requirements (Section 462 of the Real Property Law of New York) where the current owner is required to notify prospective buyers of certain property conditions, as applicable. That is not necessarily limited to whether you have a mitigation system installed in your home; any sample data from your home should be shared with potential buyers. You should consult an attorney for an explanation of your legal rights and obligations.

COMMENT 32: Where you did the soil vapor investigation on the homes, some people from Upper Valley Road were not around. Some went south for the winter. There are some people, like me, who did not realize how serious this is. I'm on Upper Valley; should I have someone sample my home?
RESPONSE 32: DEC/DOH sent multiple mailings, with information about the soil vapor intrusion investigation, and conducted multiple door-to-door solicitations for participation in the SVI study area on numerous occasions. If you were contacted and initially did not respond, or did not want samples collected from your home, but now you do, you can still contact us (contact information is included in the PRAP and in every Fact Sheet issued) and the offer for us to sample your home is still open.

COMMENT 33: Which homes on Upper Valley are affected?
RESPONSE 33: Due to privacy considerations we only show affected areas (see ROD and Public Vapor Intrusion Investigation Report), but not specific addresses or homes.

COMMENT 34: What happens when people who sold their homes did not tell the new buyers about this? How will the new people who moved in know of the opportunity to have sampling done?
RESPONSE 34: We have offered the opportunity to participate in the study multiple times; if someone is a new homeowner and the previous homeowner was offered sampling in the home, but declined, the offer is still open during the implementation of the remedial action. The new homeowner can contact us. Our contact information is listed in the PRAP as well as every Fact Sheet that is issued (if they are a new homeowner in the study area they were sent the Fact Sheet announcing this meeting).

COMMENT 35: The remediation going on at the ten homes, is it only blowing air from the soils? Where does the blown air go?
RESPONSE 35: Soil vapor is removed from below the basement slab, making the pressure under the slab less than the pressure in the house, thus keeping any sub-slab soil vapor out of the house. The extracted sub-slab vapor is discharged at the roofline of the house; at that point the sub-slab vapor mixes with the outdoor air and becomes diluted to very low concentrations that are not an exposure concern.

COMMENT 36: Who do you contact if you have a system installed and want to see what your readings are?
RESPONSE 36: Once the mitigation system is installed we do not continue to take indoor air samples. The effectiveness of the system is monitored by checking the instrument (manometer)

which measures the vacuum that is drawing vapor from below the basement slab. If the vacuum is maintained, and thus the sub-slab pressure is less than the pressure inside the house, it prevents sub-slab vapor from moving into the house. Pressure readings can also be monitored at any time by the homeowner themselves. The way to monitor this is to check the liquid level in the side of the manometer connected to the PVC pipe to see if the liquid level in that leg of the manometer is at a higher level than the liquid in open end of the manometer monitoring the pressure in the basement; this indicates whether the desired effect of a lower pressure below the slab is being achieved.

COMMENT 37: How long will the plastic chimney be there? Does the process ever end? Do you ever take the plastic piping/chimney down?
RESPONSE 37: We recommend that the systems remain in place until they are no longer needed to address exposures related to soil vapor intrusion. There may be a time when the systems could be decommissioned; at that time the appropriate steps would be taken.

COMMENT 38: Is the vapor extraction system battery operated or electric?
RESPONSE 38: The mitigation system runs off of the electricity in the home; the homeowner is responsible for paying for the electricity to run the system.

COMMENT 39: If you have to sell your house at a loss, who pays for the difference?
RESPONSE 39: This issue is beyond the scope of the ROD or the remedial program. The State is not a party to this private transaction.

COMMENT 40: This vapor mitigation is a good thing. Vapor mitigation systems are essentially the same thing as radon mitigation systems. Radon mitigation systems in homes are considered assets.
RESPONSE 40: Comment noted.

COMMENT 41: Lots of people in Victor got cancer from drinking contaminated groundwater from their wells.
RESPONSE 41: The Department takes no position relative to this comment. See response #44.

COMMENT 42: How is vegetation effected by the contamination? There are a half dozen large maple trees on Upper Valley which are close to the source. Will contaminated groundwater affect the roots of the trees? Will the trees or vegetation need to be replaced?
RESPONSE 42: It is possible for the tree root system to draw contaminated water up into the roots. The level of contamination in the groundwater is relatively low and the type of contamination that is present in the groundwater (volatile organics) near this site generally does not persist once it is brought to the surface. In other words, if groundwater is drawn up into the roots, the concentrations would be relatively low and the volatile contamination would most likely pass through the tree and be gone.

COMMENT 43: Are the groundskeepers who work above the contamination in danger?
RESPONSE 43: No. The soil contamination is limited to the site itself, and even at the site it is present at depths of 3 feet or more below the surface (the contamination is in the soil due to

leakage from the former underground storage tank). The groundwater contamination is also located well below the surface so there is no chance for groundskeepers to become exposed to it.

COMMENT 44: What are the medical problems (for example, lung cancer or brain cancer) the people in the ten homes should be aware of?
RESPONSE 44: It is not possible to accurately predict whether or what types of health effects will occur for a given exposure to an environmental chemical. Information on the health effects of the site-related chemicals (cis-1,2-dichloroethene, trichloroethene and vinyl chloride) comes primarily from studies in animals exposed to high levels for long periods of time, or from studies of workers who were repeatedly exposed to high levels of the chemicals on a long term basis. The results of these studies are not predictive of health effects for exposure via soil vapor intrusion, but rather indicate the need to reduce and minimize the potential for long-term exposure to these chemicals at levels that exceed those typically found in indoor air. Accordingly, mitigation systems were installed at the ten homes because the potential for this type of exposure to site-related chemicals via soil vapor intrusion existed. For the rest of the homes that were sampled, the levels of the chemicals were generally consistent with those commonly found in indoor air, and mitigation systems were not indicated.

COMMENT 45: At the previous meeting the Department held, it was explained to us that that to be exposed to high levels of this contamination is difficult. For example you would have to be a person that never left your home for 24 hours a day; that may be a high exposure.
RESPONSE 45: The Department, in partnership with the New York State Department of Health, evaluated residential exposure assuming a worst case scenario that exposure is occurring 24 hours a day, 7 days a week for an entire lifetime. However, no generalizations can be made; the actual exposure (high or otherwise) requires an evaluation of the data relative to each property.

COMMENT 46: Are the town of Gates officials aware of this site?
RESPONSE 46: Yes, local elected officials are on the mailing list so they receive the Fact Sheets, including the recent Fact Sheet that was sent to announce the September 22, 2010 public meeting.

COMMENT 47: Once you start the cleanup will we be kept abreast of what is going on during the cleanup? I'm disappointed in the updates we received during the last three years.
RESPONSE 47: Fact Sheets are sent to people on the mailing list to keep them updated at different milestone points (also, below there is information on how you can receive Fact Sheets by email). The last time a Fact Sheet was issued was when the last vapor intrusion report was released and a public meeting was held; that was in 2007. Prior to initiating construction activities at the site another Fact Sheet will be sent. We generally issue Fact Sheets at milestone points in the project, when there is something significant to discuss in the Fact Sheet. However, if you haven't received a Fact Sheet recently and want an update you can always contact the project manager for an update – the contact information for the project manager is on the Fact Sheet and in the PRAP. In addition, all of the documents generated for this site can be reviewed at the document repository located at the Gates Public Library.

Receive Site Fact Sheets by Email
Have site fact sheets sent right to your email inbox. NYSDEC invites you to sign up with one or more contaminated sites county email listservs available at the following web page: www.dec.ny.gov/chemical/61092.html . It's quick, it's free, and it will help keep you better informed. As a listserv member, you will periodically receive site-related information/announcements for all contaminated sites in the county(ies) you select. You may continue to also receive paper copies of site information for a time after you sign up with a county listserv, until the transition to electronic distribution is complete.

SUMMARY OF ISSUES/COMMENTS RECEIVED IN WRITING

Mr. John Nelson submitted a letter (dated September 7, 2010) which included the following comments:

COMMENT 48: Was there a successful pressure test of the TCE tank in question in 1986 or early 1987?
RESPONSE 48: Pre-1987 pressure tests, if they were performed, were not documented as a part of the remedial program for this site. Knowing if and when a successful pressure test was performed would help narrow the timeframe of the spill, but would not help establish how much contamination may have been released to the environment or determine the appropriate remedy.

COMMENT 49: What remedial action was taken between the time that tank was removed in 1987 and the 1994 Consent Order?
RESPONSE 49: Between 1987 and 1994 Erdle performed a groundwater investigation to determine if groundwater at the site had been impacted.

COMMENT 50: Subsequent to the violation of the Order in 2006 has the State sought damages from the potentially responsible parties (PRPs) or did it just implement the Superfund? Is the Consent Order a public document?
RESPONSE 50: In 2006 the State commenced a funded RI/FS. The State has not sought reimbursement of costs from PRPs to date; however, the State continues to have that option. No penalties have been sought either.
The Consent Order is not a document which has been placed in the document repository, but is available upon request.

COMMENT 51: When did Erdle first agree, if ever, that there was a significant risk to health/environment resulting from the leakage discovered in 1987? Has the PRP been involved in the remedial/economic decision-making processes in any way subsequent to the referral to the Superfund?
RESPONSE 51: Erdle signed the Consent Order to perform aspects of the remedial program at the site. Since the remedial program was referred to the State Superfund in 2006, Erdle has not been involved in decision making on the project. Erdle was informed about the availability of the Proposed Remedial Action Plan and was able to provide comments during the public comment period.

COMMENT 52: Does the level/class of hazard differ between addresses/locations in Hidden Valley? Based on your experience is there any realistic means by which Hidden Valley employees/owners/guests can determine if they have been, or will be, affected physically by the contamination?
RESPONSE 52: All exposure pathways have been evaluated and potential or actual exposures have been addressed. In the majority of homes sampled, the concentrations of site-related compounds found in the indoor air were generally consistent with levels commonly found in homes and exposure to the concentrations detected are unlikely to result in adverse health effects (i.e., the risks are low) when assuming exposure is occurring 24 hours a day, 7 days a week for an entire lifetime. However, the concentrations of site-related compounds found in a few homes were higher than what is usually found in homes. In those cases, there is a moderate risk for health effects when exposed to the site-related compounds, 24 hours a day, 7 days a week for an entire lifetime and in those homes a mitigation system was installed to address the potential or actual exposure.

COMMENT 53: Is there any history in Western New York regarding economic damage resulting from toxic waste at or near townhouse communities? What should owners in Hidden Valley expect regarding property values and common charges? Is the PRP immune from damages?
RESPONSE 53: This issue is beyond the scope of the ROD or the remedial program. The State is not a party to this private transaction.

COMMENT 54: Given that it appears that the Site was listed as Class 2 in 1987, the same as it is now, what happened that resulted in the publication of the Fact Sheet and the PRAP at this time? Was the publication at this time strictly a technical decision or were other factors involved?
RESPONSE 54: Fact Sheets are sent to the site's mailing list at different points in the remedial process to share information with the affected community; at certain milestone points in the remedial process we are required to send out a Fact Sheet. One of those milestone points is when a remedy is proposed (the issuance of the PRAP). At this point we have reached that stage in the process which resulted in the issuance of the August 2010 Fact Sheet which announced the availability of the PRAP. It should be noted that other Fact Sheets have been sent to the mailing list for this site in the past, most recently in August 2007 to announce the September 19, 2007 availability session and the latest one to announce the September 20, 2010 public meeting.

COMMENT 55: Finally, given the publicity surrounding this Site and given that seeing 'Class 2' in connection with Hidden Valley was surprising, at least to me, is it possible that the primary problem for those in Hidden Valley will involve real estate prices and common charges?
RESPONSE 55: This issue is beyond the scope of the ROD or the remedial program. The State is not a party to this private transaction.

APPENDIX B

Administrative Record

Administrative Record

Erdle Perforating
State Superfund Project
Town of Gates, Monroe County, New York
Site No. 828072

1. Proposed Remedial Action Plan for the Erdle Perforating site, dated August 2010, prepared by the New York State Department of Environmental Conservation.

2. Referral Memorandum dated September 29, 2006 for a State funded Remedial Investigation/Feasibility Study (RI/FS) and Remedial Design/Remedial Action (RD/RA).

3. "Underground Tank and Soil Excavation Report", dated July 1987, prepared by Day Engineering.

4. "Draft Final Remedial Investigation Report", dated June 1995, prepared by Radian Corporation.

5. "Interim Remedial Measure Work Plan", dated February 1996, prepared by Radian Corporation.

6. Interim Remedial Measure Decision Document, dated June 1996, prepared by the New York State Department of Environmental Conservation.

7. "Final Design Report, Interim Remedial Measure", dated March 31, 1997, prepared by Radian Engineering.

8. "Southern Boundary Well Installation Report", dated December 21, 1998, prepared by Radian Engineering.

9. "Monitoring Well Installation, Sampling and Analysis and Sewer Bedding Investigation Report", dated September 10, 2003, prepared by Barron & Associates, P.C.

10. "Monitoring Well Installation, Groundwater Sampling and Analysis", dated February 28, 2005, prepared by Barron & Associates, P.C.

11. "Summary Report for the Erdle Perforating Site, Immediate Soil Vapor Intrusion Investigation", dated September 2007, prepared by EA Engineering, P.C.

12. "Remedial Investigation Work Plan", dated November 2007, prepared by MACTEC Engineering and Consulting, P.C.

13. "Remedial Investigation/Feasibility Study Report", dated June 2010, prepared by MACTEC Engineering and Consulting, P.C.

14. “Supplemental Soil Sampling Report”, dated June 18, 2010, prepared by MACTEC Engineering and Consulting, P.C.

15. “Public Soil Vapor Intrusion Report”, dated August 2010, prepared by MACTEC Engineering and Consulting, P.C.