Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Poultney Street Site
Whitehall, Washington County, New York
Site Number 5-58-019

January 2004

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* ERIN M. CROTTY, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Poultney Street Inactive Hazardous Waste Disposal Site
Whitehall, Washington County, New York
Site No. 5-58-019

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Poultney Street 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 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 (NYSDEC) for the Poultney Street inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and/or the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the Poultney Street site and the criteria identified for evaluation of alternatives, the NYSDEC has selected excavation and offsite disposal of contaminated soils as the preferred remedy. The components of the remedy are as follows:

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

2. Contaminated subsurface soils above SCGs will be excavated and properly disposed in an offsite facility.

3. A soil gas investigation will be completed to determine the magnitude and extent, if any, of vapor phase contaminants in the subsurface.

4. Restoration of groundwater quality through monitored natural attenuation (MNA).

5. Institutional controls, in the form of an environmental easement, will be imposed to prevent the use of groundwater as a source of potable or process water.

6. The property owner will certify annually that the institutional controls are still in place, have not been altered, and are still effective.

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.

JAN 30 2004

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

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RECORD OF DECISION

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Whitehall, Washington County, New York
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SECTION 1: <u>SUMMARY OF THE RECORD OF DECISION</u>

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the Poultney Street Site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, drum abandonment and fire training exercises have resulted in the disposal of hazardous wastes, including volatile organic compounds (VOCs), chlorinated organic solvents and petroleum. These wastes have contaminated the soil and groundwater at the site, and have resulted in:

- a significant environmental threat associated with the impacts of contaminants to groundwater.
- a significant threat to human health associated with potential exposure to soil and groundwater.

To eliminate or mitigate these threats, the NYSDEC has selected the following remedy which includes:

- A remedial design program will be instituted to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.
- Contaminated subsurface soils above SCGs will be excavated and properly disposed in an offsite facility. The site will be restored by grading, placement of topsoil, and seeding of excavated and/or filled areas.
- A soil gas investigation will be completed to determine the magnitude and extent, if any, of vapor phase contaminants in the subsurface.
- Long term groundwater monitoring of natural attenuation parameters, including but not limited to: dissolved oxygen, oxidation/reduction potential, ferrous iron, sulfate/sulfide

and, contaminant concentrations will be conducted. These parameters will be used to evaluate the overall effectiveness of the remedy.

- Institutional controls, in the form of an environmental easement, will be imposed to prevent the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by NYSDOH and/or NYSDEC.

- The property owner will complete and submit to the NYSDEC an annual certification until the NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal will certify that the institutional controls put in place, pursuant to the Record of Decision, are still in place, have not been altered, and are still effective.

The selected remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially 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.

SECTION 2: SITE LOCATION AND DESCRIPTION

The site is an unimproved parcel of land, approximately 2 acres in size, south of the E.B. Metals Facility on Route 4 in the Village of Whitehall, Washington County. The site is on land owned by the Clarendon and Pittsford Railroad Company and is approximately bounded by E.B. Metals to the north, the raised railroad embankment to the south, and the Champlain Canal to the west. The eastern property boundary is located approximately 500 feet from the canal. Please see Figure 1.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

In the early 1970's the site was used by area fire departments. The local fire departments solicited and obtained from various sources containers of flammable liquids. The material was poured into a shallow depression (trench) in the center of the site during training exercises and ignited for fire extinguishing practice. The area immediately surrounding the former trench location remains the most heavily contaminated. In addition, a drum staging area was located on the western portion of the property. Drums of waste were disposed in this location as well.

3.2: Remedial History

In December 1989, 40 drums were identified and removed from the former drum staging area. The drums were found to contain acetone, trichloroethene (TCE), lighter polycyclic aromatic hydrocarbons (PAHs) and benzene, toluene, ethylbenzene & xylenes (BTEX). In connection with those activities, samples of soil and water were collected and laboratory analysis revealed contaminants were present at concentrations which exceeded applicable SCGs.

In November 1990, the NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. 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.

In March 1995, the NYSDEC initiated an Immediate Investigation Work Assignment (IIWA) to:

- Evaluate the effectiveness of the overall site remedial measures performed in 1989.
- Evaluate existing site soil and groundwater contaminant conditions within the fire training area.

The results of this work indicated that significant contamination was present and that a full Remedial Investigation/Feasibility Study (RI/FS) was necessary.

In 1998 the responsible parties retained an environmental consultant to perform a Remedial Investigation. In conjunction with the RI activities, an interim remedial measure (IRM) was completed to remove 25 empty drums and 15 cubic yards of contaminated soil from the trench area. Although very high levels of contamination were documented during this work, the consultant mistakenly concluded that the residual compounds were not a significant source of groundwater contamination. The consultant further suggested that natural process was actively degrading target compounds. The NYSDEC ultimately rejected the document and initiated a RI/FS using the New York State Superfund.

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: Clarendon and Pittsford Railroad Company, E.B. Metals, and seven area fire departments.

Pursuant to U.S. District Court consent Decree, Index 93-CV-1356, a cap of $60,000 was established for PRP efforts on the *Remedial Investigation*, and further obligated parties to pay 10 percent of the estimated remedial cost, up to a cap of $75,000. The PRPs met these obligations. Since the parties had reached the cap set for site assessment activities, the project was referred by the AG to the NYSDEC for completion.

SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between December 2001 and April 2002. The field activities and findings of the investigation are described in the RI report.

The following activities were conducted during the RI:

- Collection of surface soil samples;
- Installation of 19 soil borings and 6 monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions;
- Monitoring well development;
- Site surveying;
- Sampling of 11 new and existing monitoring wells.

To determine whether the soil and groundwater contains contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.
- Soil SCGs are based on the NYSDEC "Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels".

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 below. More complete information can be found in the RI report.

5.1.1: Site Geology and Hydrogeology

Four stratigraphic units exist in the area of study. Advancing vertically into the subsurface: fill material (sand, silt, gravel, brick & concrete fragments, metal, and organics) followed by sandy clay, fine sand, and lastly soft gray clay were identified. In the area of the trench (MW6) soil thicknesses and associated depths for each identified soil zone range from: 0-1.5 feet, 1.5-14 feet, 14-17 feet and 17-20 feet below grade respectively. Bedrock was not encountered during subsurface exploration. Two separate water bearing zones exist at the site. A shallow groundwater zone in the fill and sandy clay exists approximately one foot below grade; and a semi-confined groundwater unit in the fine sand approximately 14 feet below grade. The grey clay soil unit is serving as a confining layer preventing further vertical migration. Shallow groundwater flows north/northwest from the fire training area. At the trench, contamination above SCGs is present in soils from ground surface to the grey clay confining layer. However, the most heavily impacted zone is the sandy clay layer 1.5 to 14 feet below grade. The pore spaces of the soil in this area contain residual non-aqueous phase liquid (free product).

5.1.2: Nature of Contamination

As described in the RI report, many soil, and groundwater samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main category of contaminants that exceed their SCGs are volatile organic compounds (VOCs). Semi-volatile organic compounds were identified as well but to a much lesser degree.

Groundwater samples taken from the monitoring wells showed the presence of widespread VOC contamination. In the course of this investigation and the previous investigation, a total of eleven monitoring wells were installed. The groundwater sample results revealed ten of eleven samples with nineteen different VOC compounds.

Also, since surface water exists closely to the west of this site, the possibility of groundwater contaminating this resource is a concern.

5.1.3: Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

Chemical concentrations are reported in parts per billion (ppb) for groundwater and parts per million (ppm) for soil samples. For comparison purposes, where applicable, SCGs are provided for each medium.

Table 1 summarizes the degree of contamination for the contaminants of concern in groundwater and soil and compares the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Waste Materials

The primary chemicals of concern at the site fall into the general class of contaminants known as VOCs. These compounds would typically be found in metal cleaners, degreasers and gasoline. During fire training activity, the incineration of these liquids did not result in complete combustion for two reasons. One, the liquid itself is not burning. The volatilizing vapor from the liquid is what is actually serving as the fuel and consumed. Volatilization causes a reduction in the amount of liquid and it appears to have burned away. However, during this process the pooled liquid is continuing to infiltrate into the subsurface. Secondly, the act of extinguishing prevented combustion and any remaining liquid infiltrated into the ground.

The limited SVOC contamination can also be linked to the incomplete combustion of these same materials.

Surface Soil

Surface soil is defined as unconsolidated mineral and organic matter to a depth of 2 inches below ground surface. Six surface samples were collected during the remedial investigation; two background and four from onsite. Laboratory analysis were performed on the collected samples for semi-volatile compounds. Laboratory analysis of surface soil samples for volatile organic compounds were performed during the 1998 Remedial Investigation. Surface soils at the Poultney Street site were determined to be uncontaminated.

Subsurface Soil

Figure 2 (attached) portrays the areal extent of contamination in the subsurface soils. The center of this highly contaminated area corresponds directly with the location of the former fire training trench where the contamination extends from just below the surface to the clay layer 17-20 feet below grade. Within this area, total concentrations of VOCs exceed 160 ppm with trichloroethene being the primary contaminant detected and exceeding the respective SCG of 0.7 ppm in seven samples.

Groundwater

Contaminants remaining in the subsurface soil continue to act as a source for groundwater contamination. The entrapped contaminants leach from the soil and dissolve into the groundwater. As anticipated, the highest contaminant concentrations in groundwater are located at the trench. The principal contaminants encountered are VOCs. The total VOC concentration exceeds 185,000 ppb at monitor PZ-09. Samples collected radially from this area show a corresponding reduction in concentrations. The compound with highest concentration in groundwater is 1,2-dichloroethene (cis) at 160,000 ppb. Dichloroethene is created through the degradation of trichloroethene. 1,2-dichloroethene and trichloroethene were also the two contaminants most frequently detected in groundwater and identified as exceeding the respective SCG. Specifically, 1,2-dichloroethene exceeded the SCG of 5 ppb in 9 of 11 samples; trichloroethene exceeded the SCG of 5 ppb in 7 of 11. Analysis for semi-volatile organic compounds was performed during the 1998 Remedial Investigation; none were detected. Please refer to Table 1 and Figures 3 & 4.

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 completion of the RI/FS. There were no IRMs performed at this site during the latest RI/FS.

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 6 of the RI report.

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.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). 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.

There are no known completed exposure pathways at the site. However, potential exposure pathways exist. These are:

- Ingestion of groundwater
- Dermal contact with contaminated soil
- Inhalation of vapors in indoor air

No one is currently using site groundwater for drinking or other uses, but groundwater could be used in the future. Although the ingestion of contaminated groundwater is a potential exposure pathway, the ingestion of contaminated groundwater is not expected because the surrounding area is serviced by public water. In addition, the site is surrounded by the Champlain Canal to the west, railroad tracks and steep terrain to the south, a commercial facility to the north and a heavily vegetated area and stream to the east, limiting available area for future development.

Although site access is limited due to the canal, heavy vegetative growth and steep terrain adjacent to the railroad tracks, dermal contact with contaminated soil is possible because site access is not controlled.

Inhalation of contaminated indoor air is possible because of high concentrations of contaminants in soil and groundwater at the site. If contaminants migrate under the adjacent building, contaminated soil gas could affect the quality of indoor air.

5.4: <u>Summary of Environmental Impacts</u>

This section summarizes the existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

As stated previously, site contamination has impacted the groundwater resource in the shallow overburden aquifer. The Champlain Canal is in close proximity to the site. However, contaminants in the groundwater attenuate to significantly lower concentrations in monitors PZ-04 and PZ-07 50 - 80 feet from the source area resulting in minimal potential for impacts to fish and wildlife.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- the release of contaminants from soil into groundwater that create exceedances of groundwater quality standards; and
- the residual mass of NAPL present in the subsurface soil.

Further, the remediation goals for the site include attaining to the extent practicable:

- ambient groundwater quality standards.
- reducing contaminant concentrations in soils to below applicable SCGs.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected 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 Poultney Street Site were identified, screened and evaluated in the FS report which is available at the document repositories identified in Section 1.

A summary of the remedial alternatives that were considered for this site are discussed below. The present worth 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 and an annual percentage rate of 6% is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring will cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated soils and groundwater at the site.

Alternative 1: No Action

Total Present Worth: *$0*
Capital Cost: *$0*
Annual OM&M: *$0*
Present Worth OM&M Cost: $0

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Surface Cover with Zero-Valent Iron (ZVI) Groundwater Treatment

Total Present Worth: *$994,000*
Capital Cost: *$827,000*
Annual OM&M: *$12,120*
Present Worth OM&M Cost: $167,000

The area of contaminated soils (Figure 2) would be capped with an impermeable cover. The intent is to reduce infiltration thereby limiting the volume of precipitation flowing through contaminated soils, becoming contaminated and, entering groundwater. The cover would consist of an impermeable flexible membrane, 18 inches of soil, topsoil and grass vegetation.

Groundwater treatment would be accomplished by employing zero-valent iron (ZVI) technology. As the chlorinated VOC plume migrates by means of the natural hydraulic gradient, this plume would flow through a zone of emplaced elemental iron filings designed to destroy chlorinated contaminants through reductive dechlorination. The treatment zone, inherently more permeable than the surrounding soil formation, is constructed across the path (perpendicular) of groundwater flow encouraging preferential migration through that medium. The treatment wall would be installed from grade to the underlying gray clay layer approximately 20 feet deep. The iron would react with the chlorinated compounds causing dechlorination as the groundwater passes through the wall. Groundwater concentrations would eventually be reduced to within applicable SCGs downgradient of the reactive treatment wall.

Preliminary small scale testing would be required to establish actual bed parameters for use in the final design. Engineering design is expected to take six to nine months followed by several months for actual cap and reactive treatment wall installation. Due to the passive nature of this remedy, ZVI treatment would continue for many years (30 years was presumed for cost estimating purposes) to achieve groundwater SCGs.

Alternative 3: Soil Excavation with Groundwater Monitored Natural Attenuation

Total Present Worth: *$1,116,000*
Capital Cost: *$967,000*
Annual OM&M: *$22,900*
Present Worth OM&M Cost: *$149,000*

Soil would be excavated to the basal grey clay layer 18 -20 feet below grade in the two areas of soil contamination shown on Figure 5. Due to the shallow groundwater and the close proximity of the railroad embankment, sheetpiling would be required to maintain integrity of the railroad line and avoid excessive excavation of uncontaminated soils in order to stabilize the excavation.

Because of the shallow groundwater table, management of groundwater would be a principle aspect of this remedy. Both wet and dry excavation approaches are viable. These options will be evaluated further during the remedial design phase. Although excavation of contaminated soil is the primary objective, removal and treatment of contaminated groundwater within the sheetpiling would occur as well and further reduce contaminants in the subsurface.

Subsequent soil sampling and analysis would determine to what extent the material is contaminated. The excavated material would fall into one of three classifications: uncontaminated or meeting SCGs, non-hazardous, and hazardous. Each classification would be handled appropriately.

Finally, the area would be backfilled, sheetpile removed, re-graded and seeded.

The secondary aspect of this remedy would be monitoring of groundwater for natural attenuation. Monitored Natural Attenuation (MNA) exploits natural occurring processes in the environment to degrade low level contamination. This portion of the remedy would primarily focus on the low level contamination downgradient of the source. It would also address any residual groundwater contamination which may exist at the source following the excavation program.

Many of the existing monitoring wells would be destroyed during soil removal activities. As a result, additional monitoring points would be installed to further define the extent of downgradient contamination and provide locations to obtain MNA data.

Engineering design is expected to take two to four months followed by several months for excavation, treatment and soil disposal operations. Groundwater monitoring would be ongoing for many years (15 presumed) due to the passive nature of MNA.

Alternative 4: Soil Excavation with Groundwater Extraction and Treatment

Total Present Worth: *$1,621,000*
Capital Cost: *$1,007,000*
Annual OM&M: *$63,200*
Present Worth OM&M Cost: *$614,000*

The excavation and disposal aspect of this alternative is the same as outlined in Alternative 3 above.

Following excavation, groundwater recovery and treatment would commence to effect physical and proactive removal of the low level dissolved contamination at the site. Groundwater recovery and treatment activities would involve the installation of recovery wells at select locations downgradient. Contaminated groundwater would be extracted from the subsurface, undergo appropriate treatment and subsequently discharged after attainment of applicable SCGs.

Implementation of this alternative would be a lengthy endeavor. The groundwater recovery and treatment system would be operated at the site for an estimated fifteen year period and involve significant OM&M costs.

Alternative 5: In-situ Electrical Resistance Heating and Monitored Natural Attenuation

Total Present Worth: *$1,139,000*
Capital Cost: *$990,000*
Annual OM&M: *$22,900*
Present Worth OM&M Cost: *$149,000*

Electrical Resistance Heating (ERH) is an in-situ remedial technology whereby the subsurface soils are heated promoting volatilization of contaminants. More specifically, electrodes are installed in the subsurface; and, as electrical current passes from anodes to cathodes, the resistance caused by the soil/water generates the necessary heat. Nearer the surface the volatilized compounds would be collected via a vapor recovery system and subsequently treated.

The implementation of Monitored Natural Attenuation (MNA) would be as described in alternative 3.

It is anticipated that soil remediation would be completed within several months. However, groundwater monitoring would continue for many years due to the passive nature of MNA.

Alternative 6: Surface Cover and Soil/Groundwater Containment

Total Present Worth: *$483,000*
Capital Cost: *$201,000*
Annual OM&M: *$13,500*
Present Worth OM&M Cost: *$186,000*

This alternative presents an option which would completely contain the waste in place. The area of contaminated soil would be encircled with watertight sheetpiling keyed into the basal grey clay underlying the site at approximately twenty (20) feet. The containment barrier would prevent further migration of contaminated groundwater from the waste mass. At the surface, a flexible geomembrane would provide an impermeable cover to reduce or eliminate infiltration.

Design and implementation of this alternative could be completed in a relatively short time frame (6-8 months) due to the proven and familiar technologies employed. A limited monitoring program would be conducted to document contaminant trends in the existing downgradient plume.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York State. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

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 NYSDEC has determined to be applicable on a case-specific basis.

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

3. Short-term 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.

4. 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.

5. 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.

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 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 Table 2.

This final criterion 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.

8. Community Acceptance Concerns of the community regarding the RI/FS reports and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the NYSDEC addressed the concerns raised. No significant public comments were received.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

The NYSDEC has selected Alternative 3, Soil Excavation with Monitored Natural Attenuation as the remedy for this site. The elements of this remedy are described at the end of this section.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS. Soil excavation and offsite disposal is selected because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It will achieve the remediation goals for the site by removing the soils that create the most significant threat to public health and the environment, it will greatly reduce the source of contamination to groundwater, and it will create the conditions needed to restore groundwater quality to the extent practicable. Alternative 3 also provides the most timely and effective means to remove a large volume of contamination from the environment. Unlike Alternatives 1, 2, 5 & 6 where the material will remain on-site, Alternative 3 eliminates the potential for future environmental or public impact posed by the contaminated soil.

Alternative 1 would involve no further reduction of contaminants. Contaminated soil would continue to act as the source for groundwater contamination and pose a threat for impact as outlined in section 5.

Alternatives 2, 4, 5, and 6 would also comply with the threshold selection criteria but to a lesser degree or with lower certainty. Because Alternatives 2, 4, 5, and 6 satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Achieving long-term effectiveness is best accomplished by excavation and removal of the contaminated overburden soils and groundwater in the former disposal area (Alternatives 3 and 4). The other alternatives (2, 5 & 6) result in the material remaining on-site and therefore a potential hindrance to site use. The suitability and long term effectiveness of ZVI and ERH (Alt. 2 & 5) at this location has yet to be demonstrated. Alternatives 2 and 6 would result in complete containment of the waste onsite. However, an institutional control for soil and groundwater, cell/cover repair & maintenance and long-term monitoring would be required.

Alternatives 3, 4 and 6 are favorable in that they are readily implementable. As mentioned above, there is some uncertainty regarding the implementability of Alternatives 2 & 5 which would require pilot testing in order to determine whether they are suited to this site.

Alternative 6 would greatly reduce the mobility of contaminants but this reduction is dependent upon the long-term maintenance of the containment system. Alternatives 2 & 5 would reduce the toxicity of contaminants in soils by chemical/physical treatment. Alternatives 3 & 4 would reduce the toxicity and mobility of the contaminants at the site by disposal of contaminated soil in a secure offsite facility.

The cost of the alternatives varies significantly. Although capping and containment (Alternative 6) is less expensive than excavation (Alternatives 3 & 4) or treatment (Alternatives 2 & 5), periodic evaluation, repair, and maintenance of the cap would be required. Alternatives 3 & 4 are favorable because the continuing source of groundwater contamination is eliminated. Alternative 3 also provides an economical means to reduce dissolved VOC contamination outside the source area. This aspect of Alternative 3 is partially demonstrated already since groundwater contaminant levels currently attenuate to much lower concentrations within a short distance of the source. Active groundwater recovery and treatment of the low level groundwater contamination downgradient of the source (Alternative 4) is the most costly remedy due to the groundwater extraction/treatment component. Uncertainty exists surrounding how clay layers may affect groundwater yield and effective areas of influence in Alternative 4 as well. Treatment (Alternative 2) is the second most cost effective remedy based upon current presumptions; however, its implementability and effectiveness are uncertain.

The estimated present worth cost to implement the remedy is $1,116,000. The cost to construct the remedy is estimated to be $967,000 and the estimated average annual operation, maintenance, and monitoring costs for 30 years is $22,900.

The elements of the remedy are as follows:

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

2. Contaminated subsurface soils above SCGs will be excavated and properly disposed in an offsite facility. The site will be restored by grading, placement of topsoil, and seeding of excavated and/or filled areas.

3. A soil gas investigation will be completed to determine the magnitude and extent, if any, of vapor phase contaminants in the subsurface.

4. Long term groundwater monitoring of natural attenuation parameters, including but not limited to: dissolved oxygen, oxidation/reduction potential, ferrous iron, sulfate/sulfide and, contaminant concentrations will be conducted. These parameters will be used to evaluate the overall effectiveness of the remedy.

5. Institutional controls, in the form of an environmental easement, will be imposed to prevent the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by NYSDOH and/or NYSDEC.

6. The property owner will complete and submit to the NYSDEC an annual certification until the NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal will certify that the institutional controls put in place, pursuant to the Record of Decision, are still in place, have not been altered, and are still effective.

TABLE 1
Nature and Extent of Onsite Contamination
December 2001 - February 2002

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]		SCG[b] (ppm)[a]	Frequency of Exceeding SCG	
		Min	Max		Num. Exceed	Num. Of Samples
Semivolatile Organic Compounds (SVOCs)	Anthracene	ND	ND	50	0	4
	Benzo(a)anthracene	ND	0.045	0.224	0	4
	Benzo(a)pyrene	ND	0.042	0.061	0	4
	Benzo(b)fluoranthene	ND	0.036	1.1	0	4
	Benzo(g,h,i)perylene	ND	0.13	50	0	4
	Benzo(k)fluoranthene	ND	0.32	1.1	0	4
	Butylbenzylphthalate	ND	0.32	500	0	4
	Chrysene	ND	0.044	0.4	0	4
	Dibenz(a,h)anthracene	ND	ND	0.014	0	4
	Fluoranthene	ND	0.072	50	0	4
	Fluorene	ND	ND	50	0	4
	Indeno(1,2,3-cd)pyrene	ND	0.039	3.2	0	4
	Phenanthrene	ND	0.040	50	0	4
	Pyrene	ND	0.061	50	0	4
Miscellaneous Parameters						
	Total Organic Carbon (TOC)	37,560	111,000	—	NA	4

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]		SCG[b] (ppm)[a]	Frequency of Exceeding SCG	
		Min	Max		Num. Exceed	Num. of samples
Volatile Organic Compounds (VOCs)	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.004	6	0	26
	1,1-Dichloroethene	<0.011	0.03	0.4	0	26
	1,2-Dichloroethene (trans)	<0.011	0.16	0.3	0	26
	Acetone	<0.011	0.092	0.2	0	26
	Benzene	<0.011	0.14	0.06	1	26
	Carbon disulfide	<0.011	0.027	2.7	0	26
	Ethylbenzene	<0.011	7.1	5.5	1	26
	Isopropylbenzene (Cumene)	<0.011	0.11	2.3	0	26
	Methyl ethyl ketone (2-Butanone)	<0.011	0.012	0.3	0	26
	Methylene chloride	<0.011	0.019	0.1	0	26
	Tetrachloroethene	<0.011	0.004	1.4	0	26
	Toluene	ND	3.9	1.5	2	26
	Trichlorethene	ND	150	0.7	7	26
	Vinyl chloride	ND	0.79	0.2	3	26
	Xylene (total)	<0.011	17	1.2	1	26
Semivolatile Organic Compounds (SVOCs)	2-Methylnaphthalene	ND	5	36.4	0	26
	Anthracene	ND	0.11	50	0	26
	Benzo(a)anthracene	ND	0.35	0.224	2	26
	Benzo(a)pyrene	ND	0.28	0.061	2	26
	Benzo(b)fluoranthene	ND	0.27	1.1	0	26
	Benzo(g,h,i)perylene	ND	0.43	50	0	26
	Benzo(k)fluoranthene	ND	0.33	1.1	0	26

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]		SCG[b] (ppm)[a]	Frequency of Exceeding SCG	
		Min	Max		Num. Exceed	Num. of samples
	bis(2-Ethylhexyl) phthalate	ND	2	50	0	26
	Butylbenzylphthalate	ND	3.9	50	0	26
	Chrysene	ND	0.38	0.4	0	26
	Dibenz(a,h)anthracene	ND	0.082	0.014	2	26
	Di-n-butylphthalate	ND	0.083	8.1	0	26
	Di-n-octylphthalate	ND	1.6	50	0	26
	Fluoranthene	ND	0.69	50	0	26
	Fluorene	ND	0.21	50	0	26
	Indeno(1,2,3-cd)pyrene	ND	0.21	3.2	0	26
	Naphthalene	ND	2.5	13	0	26
	Phenanthrene	ND	0.49	50	0	26
	Phenol	ND	0.047	0.03	1	26
	Pyrene	ND	0.66	50	0	26
Miscellaneous Parameters	Total Organic Carbon (TOC)	462.0	39,070	—	NA	25

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]		SCG[b] (ppb)[a]	Frequency of Exceeding SCG	
		Min	Max		Num. Exceed	Num. of Samples
Volatile Organic Compounds (VOCs)	1,1,2-Trichloroethane	<10	24.0	3	3	11
	1,1-Dichloroethene	ND	200.0	5	3	11
	1,2-Dichloroethane	<10	8.0	0.6	1	11
	1,2-Dichloroethene (cis)	<10	160,000	5	9	11
	1,2-Dichloroethene (trans)	ND	330.0	5	4	11
	Acetone	<10	200.0	50	1	11
	Benzene	ND	34.0	1	1	11
	Carbon disulfide	ND	1.0	60	0	11
	Chloroform	ND	1.0	7	0	11
	Cyclohexane	ND	15.0	50	2	11
	Ethylbenzene	<10	110.0	5	2	11
	Methyl ethyl ketone (2-Butanone)	<10	120.0	50	1	11
	Methylene chloride	ND	3.0	5	0	11
	Tetrachloroethene	ND	24.0	5	2	11
	Toluene	ND	1,300.0	5	2	11
	Trichloroethene	ND	25,000.0	5	7	11
	Vinyl chloride	ND	10,000.0	2	5	11
	Xylene (total)	<10	330.0	5	2	11
Miscellaneous Parameter	Chloride	<3	183.0	250	—	11
	Dissolved Organic Content	<5	120.0	NA	NA	11
	Nitrate	ND	0.72	10	0	11
	Sulfate	ND	249.0	250	0	11
	Sulfide	ND	1.72	0.05	3	11
Dissolved Gases	Ethane	<1	99.0	NA	—	11
	Ethene	<1	1,600.0	NA	—	11

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]		SCG[b] (ppb)[a]	Frequency of Exceeding SCG	
		Min	Max		Num. Exceed	Num. of Samples
	Methane	ND	2,800.0	NA	—	11

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m^3 = micrograms per cubic meter
ND = None Detected
NA = Not Applicable

[b] SCG = standards, criteria, and guidance values;

For soils: NYSDEC TAGM 4046: Determination of Soil Cleanup Objectives and Cleanup Levels; HWR-94-4046, January 24, 1994 (Revised).

For groundwater: NYSDEC TOGS (1.1.1): Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998 (including 4/2000 Addendum). GA classification.

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
Alternative #1: No Action	$0	$0	$0
Alternative #2: Surface Cover with ZVI Groundwater Treatment	$827,000	$12,120	$994,000
Alternative #3: Soil Excavation with Groundwater Monitored Natural Attenuation	$967,000	$22,900	$1,116,000
Alternative #4: Soil Excavation with Groundwater Extraction and Treatment	$1,007,000	$63,200	$1,621,000
Alternative #5: In-situ Electrical Resistance Heating and Monitored Natural Attenuation	$990,000	$22,900	$1,139,000
Alternative #6: Surface Cover and Soil/Groundwater Containment	$201,000	$13,500	$483,000