Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Scobell Chemical Site, Operable Unit #2
Town of Brighton, Monroe County
Site Number 8-28-076

March 2002

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

DECLARATION STATEMENT - RECORD OF DECISION

Scobell Chemical Operable Unit #2 Inactive Hazardous Waste Site
Town of Brighton, Monroe County, New York
Site No. 8-28-076

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Scobell Chemical Operable Unit #2 class 2 inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law. The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Scobell Chemical Operable Unit #2 inactive hazardous waste site and upon public 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 release 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 the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Scobell Chemical Operable Unit #2 and the criteria identified for evaluation of alternatives, the NYSDEC has selected in-situ thermal treatment for the off-site source area, flushing of contaminants in the shallow bedrock under the railroad tracks, a limited downgradient groundwater extraction and treatment system, and long-term monitoring. The components of the remedy are as follows:

- In-situ thermal treatment to address the concentrated source area located in the bedrock and bedrock groundwater north of on-site operable unit #1 (north of the railroad tracks). The remedy will include injection wells, to introduce a heat source (e.g., steam), as well as groundwater/vapor extraction wells to remove the mobilized contamination from the bedrock.

- To address the contamination under the railroad tracks an in-situ remediation technology (e.g., surfactant flushing or injecting chemical oxidants - to be determined during the design) will be implemented to prevent disruption of rail service.

- At the completion of the in-situ thermal treatment the NYSDEC will also evaluate the need for additional remedial measures and/or property use restrictions to control threats posed by any residual contamination.

- A downgradient groundwater extraction and treatment and/or in-situ treatment system (e.g., enhanced in-situ bioremediation) will be put in place to address the portion of the groundwater plume downgradient of the source area.

- Since the remedy results in residual contamination remaining at the site, a long-term monitoring program will be instituted.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being 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.

3/29/2002
Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

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SCOBELL CHEMICAL - Operable Unit No. 2 (Off-site)

Town of Brighton, Monroe County, New York
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SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health has selected this remedy to address the significant threat to human healt and/or the environment created by the presence of hazardous waste at the Scobell Chemical Site, Operabl Unit #2, a Class 2 inactive hazardous waste disposal site. As more fully described in Sections 3 and 4 of t document, past storage and handling practices at the on-site area have resulted in the disposal of a number hazardous wastes, including toluene, tetrachloroethene, trichloroethene, and their breakdown products, at t site. Due to the significant historical releases at the on-site area, contamination has migrated from the sit surrounding areas (operable unit #2), especially to the bedrock below the open field located north of the s (on Rochester Gas & Electric property adjacent to their substation). These disposal activities have result the following significant threats to the public health and/or the environment:

C a significant threat to human health associated with 1) the potential for exposure to contaminated groundwater if wells were to be installed in the plume, and 2) the potential for contamination to mi below adjacent buildings and generate vapors causing indoor air problems.

C a significant environmental threat associated with the site continuing to act as a source of contamin to the off-site groundwater due to the presence of a highly contaminated source area containing de non-aqueous phase liquid (DNAPL).

In order to eliminate or mitigate the significant threats to the public health and/or the environment that the hazardous wastes present at the Scobell Chemical off-site operable unit have caused, the following remed was selected:

C In-situ thermal treatment to address the concentrated source area located in the bedrock and bedro groundwater north of on-site operable unit #1 (north of the railroad tracks). The remedy will inclu injection wells, to introduce a heat source (e.g., steam), as well as groundwater/vapor extraction we to remove the mobilized contamination from the bedrock.

C To address the contamination under the railroad tracks NYSDEC will use an in-situ remediation technology (e.g., surfactant flushing or injecting chemical oxidants - to be determined during the de to prevent disruption of rail service.

- Due to the difficulty of addressing the entire contaminant source area present in a fractured bedroc system, residuals will likely remain after the completion of the in-situ thermal treatment. At that t NYSDEC will also evaluate the need for additional remedial measures and/or property use restrictio to control threats posed by any residual contamination. If property use restrictions are implemente there will be an annual certification to ensure they are still in place and effective.

- A downgradient groundwater extraction and treatment and/or in-situ treatment system (e.g., enhance in-situ bioremediation) will be put in place after the completion of the in-situ thermal treatment of source area.

- Since the remedy results in residual contamination remaining at the site, a long-term monitoring pr will be instituted. The details of the long-term monitoring program will be coordinated with what w needed for the on-site operable unit. This program will also monitor the effectiveness of the remed program.

The selected remedy, discussed in detail in Section 8 of this document, is intended to attain the remediatio goals selected for this site in Section 6 of this Record of Decision (ROD), in conformity with applicable standards, criteria, and guidance (SCGs).

SECTION 2: SITE LOCATION AND DESCRIPTION

The Scobell Chemical on-site operable unit (OU#1) (Site No. 8-28-076) is located at 1 Rockwood Place i the Town of Brighton; the off-site operable unit (OU#2) is located north of OU#1, north of the railroad tra and just east of the Rochester Gas & Electric substation (see Figure 1). The site is located in a highly urba area in the Town of Brighton, at the eastern boundary of the City of Rochester. Industrial and commercial properties are located directly to the west of the site. A major CSX railroad line separates the on-site ope unit (south side) from the off-site operable unit (north side), and to the east and south is the I-490 and I-59 highway interchange. OU#1 is the location of a former chemical operation that conducted chemical stora warehousing, repackaging and sales of hazardous materials. In 1988, as a part of the New York State Department of Transportation's (NYSDOT) "can-of-worms" highway reconstruction project, an Interim Remedial Measure (IRM) was conducted by NYSDOT which essentially removed soil and bedrock from ha of the property for off-site disposal [Note: NYSDOT completed the IRM in order to finish the highway interchange re-construction project]. The portion of the site that remained (the current footprint of OU#1) placed on NYSDEC's Registry of Inactive Hazardous Waste Disposal Sites.

Operable Unit No. #1 consists of the site property itself ("on-site operable unit"). An Operable Unit repre a portion of the site remedy which for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contaminatio Operable Unit #2, which is the subject of this ROD, consists of the area north of OU#1 where significant contamination has migrated from OU#1, mainly in the shallow bedrock.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The Scobell Chemical Site is the location of a former chemical repackaging company. The site was operat from the 1920s until 1986. This site was owned by Scobell Chemical Company from about 1920 until 19 and then by Raeco Products, Inc. until 1988. Both corporations ran chemical distribution and repackaging operations. Assorted chemicals were purchased by the company in bulk and repackaged into smaller containers for resale. The site had one main building, two smaller structures and four above ground storag tanks. The amount of and type of the materials handled is unclear, but significant subsurface contaminatio been identified at both OU#1 and OU#2. The main source of contamination is most likely the result of sp that occurred on-site over a long period of time.

3.2: Remedial History

In 1998 NYSDEC initiated a Site Investigation (Remedial Investigation) for the Scobell Chemical Site. As result of the data collected during this investigation, it became apparent that a significant amount of contamination had migrated to the north of the site property, mainly in the shallow bedrock. The 1998 Site Investigation generated enough information, for the on-site area itself, to develop and screen remedial alternatives as a part of the Feasibility Study (FS). However, additional information was needed to define t extent of the contamination downgradient (to the north) of the on-site area. As a result, the site was divid into two operable units: the on-site operable unit (OU #1) and the off-site operable unit (OU #2). Enough information was available for the on-site area to evaluate and select a remedy; the remedy selected include overburden groundwater collection and treatment, soil vapor extraction to address the contaminated soils, the installation of DNAPL recovery wells (as documented in the March 1999 Record of Decision for OU#

The off-site investigation was initiated in 2000; the results of that investigation were used to evaluate poten remedial alternatives for the off-site operable unit. This ROD summarizes the information generated, as w the evaluation of potential remedies for the off-site operable unit (OU#2).

SECTION 4: SITE CONTAMINATION

To evaluate the contamination present at the site and to evaluate alternatives to address the significant threa human health and the environment posed by the presence of hazardous waste, the NYSDEC has recently conducted a Remedial Investigation/ Feasibility Study (RI/FS).

4.1: Summary of the Remedial Investigation

The purpose of the RI for OU#2 was to define the nature and extent of any contamination that resulted fro previous activities at the site and has migrated to the area north of the site. A report entitled Remedial Investigation Report, Scobell Chemical Site, dated February 1999 (Operable Unit #1)/Revised January 20 (Operable Unit #2), has been prepared which describes the field activities and findings of the RI in detail.

The RI included the following activities:

- # Geophysical studies, including a shear wave seismic reflection survey and a multi-electrode resistiv survey, to help determine the orientation and depths of bedrock fractures that may contain significa contamination such as DNAPL.

- # Monitoring well installation and development, hydraulic conductivity testing, and groundwater samp to help determine the nature and extent of the contamination, as well as to gather information on the properties of the groundwater system beneath the site.

- # Surface water sampling to determine the degree to which site-related contamination is migrating in media (sediment sampling had been performed during the 1998 Site Investigation).

- # Site survey and mapping to update the information/ base map from the OU#1 RI.

To determine which media (soil, groundwater, etc.) are contaminated at levels of concern, the RI analytica data were compared to environmental standards, criteria, and guidance values (SCGs). Groundwater, drinki water and surface water SCGs identified for the Scobell Chemical off-site operable unit are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of New York State Sanitary Code. Guidance values for evaluating contamination in sediments are provided by the NYSDEC "Technica Guidance for Screening Contaminated Sediments."

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 comp information can be found in the RI Report.

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

4.1.1: <u>Site Geology and Hydrogeology</u>

The site is underlain by approximately 6-12 feet of overburden consisting of silty sand with trace amounts clay. Bedrock was found immediately below the overburden and is classified as a Dolostone with the top feet being "weathered."

Overburden groundwater at the site was encountered near the bedrock overburden interface. A thin zone o groundwater was found in some of the overburden/rock interface wells/piezometers and, at OU#2, flows to north-northeast.

Shallow bedrock groundwater elevations are at, or just below the surface of the bedrock (from approximat 0-4 feet of the bedrock surface) north of the site (MW-4D, MW-5D, MW-6S, MW-7S). Groundwater flo in the bedrock appears to flow to the north-northeast.

Deep bedrock groundwater was encountered just below the surface of the bedrock in MW-6D, but was encountered at elevations approximately 30-60 feet below the bedrock surface in MW-7D, MW-8D, and MW-9D.

Tests performed during the Site Investigations indicate that the groundwater can move relatively easily thı the thin zone of saturated soil (overburden) on top of bedrock (average hydraulic conductivity is 1.8 x 10^{-2} cm/sec). In the shallow bedrock wells located north of the railroad tracks, the ability of the water to flow much lower (the average hydraulic conductivity was approximately 1.0 x 10^{-5} cm/sec for MW-4D and MW 5D; the hydraulic conductivities were too low to be measured in MW-6S and MW-7S [all of which are shallow bedrock wells located north on the on-site area]). Of the four deep bedrock wells, one had a hydra conductivity of 2.86 x 10^{-4} cm/sec (MW-6D) while the other three either did not produce enough water to perform the appropriate conductivity testing, or had a hydraulic conductivity too low to be measured.

4.1.2: <u>Nature of Contamination</u>

As part of the OU #2 field activities, groundwater samples were collected from seven existing wells install part of the OU #1 RI (MW-1D, MW-2D, MW-3D, MW-4D, MW-4S, MW-5D, and MW-5S) and the nine monitoring wells installed as part of the OU #2 RI (MW-6S/6D, MW-7S/7D, MW-8S/8D, MW-9S/9D, an overburden well OB-1).

In addition to the groundwater samples discussed above, surface water samples were collected from the retention pond (located east of OU#2 and just north and west of I490/I-590 interchange) and from the drainage ditch that is the outlet for the retention pond.

As described in the RI report, a number of groundwater and surface water samples were collected at the sit characterize the nature and extent of contamination. The main category of contaminants which exceed thei SCGs are volatile organic compounds (VOCs). The VOCs of concern are benzene, carbon disulfide, 1,1-dichloroethene (DCE), 1,2-dichloroethene, tetrachloroethene (PCE), toluene, trichloroethene (TCE), viny chloride, and xylene.

4.1.3: <u>Extent of Contamination</u>

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

<u>Groundwater</u>

The discussion of the groundwater contamination has been divided into three separate sections: overburden, shallow bedrock, and deep bedrock groundwater.

Four monitoring well couplets (MW-6S/MW-6D through MW-9S/MW-9D) were installed approximately 15 to 25 feet below ground surface (bgs) and approximately 60 to 80 feet bgs into the bedrock aquifer. They were located based on the results of a fracture trace analysis; the intent was to locate the wells along predominant

fractures (as interpreted from the fracture trace analysis) to evaluate the potential for non-aqueous phase liquid (NAPL) contamination to migrate from the site via gravity flow in bedrock fractures.
One overburden well, OB-1, was installed near an apartment complex, located on the south side of Blossom Road, north-northeast of the site. The bedrock wells consist of open hole monitoring wells with sampling intervals of approximately 10 to 15 feet in length. There are six shallow bedrock wells (MW-4D, MW-5D, MW-6S, MW-7S, MW-8S, and MW-9S) with monitored intervals starting as shallow as 4 feet below the bedrock surface and ending as low as 24 feet below the bedrock surface. There are four "deep" bedrock wells (MW-6D, MW-7D, MW-8D, and MW-9D) with monitored intervals starting as shallow as 44 feet below the bedrock surface and ending as deep as 73 feet below the bedrock surface.

All of the groundwater and surface water standards, for the contaminants discussed below, are 5 ppb, with the exception of the groundwater standards for benzene (0.7 ppb), carbon disulfide (50 ppb), and vinyl chloride (2 ppb).

Overburden/Bedrock Interface Groundwater

Monitoring wells installed at the overburden/bedrock interface include MW-4S, MW-5S, and OB-1. Reported concentrations of total VOCs are highest nearest the onsite area and decrease away from the site [Note: OB-1, the overburden well located farthest downgradient, was contaminated with only one VOC (1,2-DCE at 9 ppb)]. The majority of VOCs detected were chlorinated VOCs. As a percentage of the total VOCs, chlorinated VOCs comprise nearly 100%. Only trace quantities of BTEX (benzene, toluene, ethylbenzene, toluene - compounds typically associated with petroleum products) VOCs were detected in MW-4S.

Contaminants detected at elevated concentrations include 1,1-DCE (up to 8 ppb), 1,2-DCE (up to 4,200 ppb), PCE (up to 140 ppb), TCE (up to 3,500 ppb), and vinyl chloride (up to 100 ppb).

Shallow Bedrock Groundwater (off-site)

Monitoring wells in the shallow bedrock zone include MW-4D, MW-5D, MW-6S, MW-7S, MW-8S, and MW-9S. The majority of VOC detections were chlorinated VOCs, particularly TCE and PCE. There also was a BTEX component of VOC detections (see Figure 2 for total VOCs in the shallow bedrock).

Contamination is present at the highest concentrations at, and just north of the on-site area. The concentrations decrease relatively quickly as you move downgradient (north-northeast) with concentrations at MW-7S two orders of magnitude (a factor of 100) less than at MW-4D; MW-7S is approximately 600 feet north-northeast of MW-4D. Contaminant concentrations at MW-6S (approximately 150 feet west, or sidegradient, of the line between the on-site area and MW-4D) are also two orders of magnitude less than what was detected in MW-4D.

Contaminants detected at elevated concentrations include benzene (up to 23 ppb), carbon disulfide (up to 130 ppb), 1,1-DCE (up to 330 ppb), 1,2-DCE (up to 49,000 ppb), PCE (up to 21,000 ppb), toluene (up to 260 ppb), TCE (up to 500,000 ppb), vinyl chloride (up to 750 ppb), and xylene (up to 100 ppb).

TCE was also detected above groundwater standards at MW-9S (140 ppb; this is above standards, but three orders of magnitude (a factor of 1,000) less than what has been detected on-site), located approximately 900 feet south-southeast of the on-site area. It is possible that contamination may have been transported to this area in the past as a small "slug" of product that moved along bedrock fractures. If the on-site area is the source of this contamination the transport mechanism was not the result of migration as a dissolved component of the groundwater, since groundwater flow is to the northeast.

Deep Bedrock Groundwater

Monitoring wells in the deep bedrock groundwater zone include MW-6D, MW-7D, MW-8D, and MW-9D. In monitoring wells MW-6D and MW-7D, the majority of VOCs detected were primarily chlorinated VOCs. In monitoring well MW-8D, the majority of VOCs detected were BTEX compounds. Chlorinated VOCs were not detected in upgradient monitoring well MW-9D. However, low concentrations of BTEX compounds were reported in MW-9D indicating the site may not be the source of the BTEX in the deep bedrock. Levels of BTEX, where detected, were generally quite low and could be due to small localized spilling of fuel.

Site-related chlorinated VOCs (i.e., TCE, DCE) were present in the deep bedrock at elevated concentrations; the concentrations just north of the on-site area were the highest (3,300 ppb of DCE at MW-6D) with the concentrations quickly dropping to the north-northeast (140 ppb DCE/ 220 TCE at MW-7D, located approximately 750 feet northeast of MW-6D).

Contaminants detected at elevated concentrations include benzene (up to 180 ppb), carbon disulfide (up to 190 ppb), 1,2-DCE (up to 3,300 ppb), PCE (up to 28 ppb), toluene (up to 13 ppb), TCE (up to 370 ppb), vinyl chloride (up to 180 ppb), and xylene (up to 57 ppb).

Surface Water

A total of five surface water samples were taken downstream of the site (to the northeast of the on-site area); three of the samples were taken from the retention pond, located west of I-590 and north of the railroad tracks, and two of the samples were taken downstream of the outlet of the detention pond. The sample located farthest downstream (SW-5) was collected just north of Blossom Road between I-590 and the on-ramp from Blossom Road to I-590N. TCE and DCE were the only two contaminants detected in the surface water samples. The results indicated concentrations ranging from 30 ppb (for both TCE & DCE at SW-1, located closest to the site) to non-detect (TCE was not detected at SW-3, located at the midpoint/west side of the pond). TCE and DCE were detected at the downstream sample location (SW-5), but the concentrations detected were below surface water standards for those contaminants.

DNAPL

During the 2000 investigation, DNAPL was encountered in MW-3D (0.02 feet thick) and MW-4D (0.01 feet thick); one DNAPL sample was collected from MW-3D (northwest corner of on-site area). There was insufficient volume to obtain a sample from MW-4D. Analytical results of the DNAPL sample from MW-3D indicated that the highest organic contaminant concentration was for TCE at 780,000 ppb.

During the 1998 investigation a more significant volume of DNAPL was encountered when monitoring wells MW-3D and MW-4D were sampled (three inches of DNAPL in the bailer was noted on the sampling log for MW-3D).

The contamination present in the DNAPL sample taken from MW-4D included TCE (640,000,000 ppb or 64%), PCE (43,000,000 ppb or 4.3%), 1,2-DCE (260,000 ppb), carbon disulfide (490,000 ppb), toluene (540,000 ppb), xylene (460,000 ppb), and chloroform (1,200,000 ppb).

4.2: 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 health risks can be found in Section 6.1 of the RI report.

An exposure pathway is the manner by which an individual may come in contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Pathways which are known to or may exist at the site include:

- Direct contact with groundwater could occur if wells within the contaminant plume are installed/used for irrigation or other non-potable purposes (the area around the site is served by public water).

- There is the potential for contamination to migrate to existing buildings adjacent to the site and generate vapors which could cause indoor air problems.

- Future development on site presents the potential for exposure via the migration of contaminated groundwater and/or vapors into buildings.

4.3: Summary of Environmental Exposure Pathways

This section summarizes if, and what types of environmental exposures and ecological risks may be presented by the site. The Fish and Wildlife Impact Assessment included in the RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources.

There are relatively low levels of site-related contaminants in the surface water adjacent to the site, but these contaminants are not persistent in the environment (e.g., when exposed at the surface they volatilize quickly/they don’t tend to bio-accumulate). After consideration of the above-mentioned potential impacts, relative to the conditions present at the site, it was determined that impacts to wildlife as a result of contamination from the site is not occurring.

SECTION 5: 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 documented Potential Responsible Parties (PRP) for the site include: Raeco Products, Inc. and Mr. John H. Rae (Raeco defendants); Scobell Chemical Company and Mr. James B. Scobell (Scobell defendants). In 1995 settlements were reached with both the Raeco defendants and the Scobell defendants. As a part of the settlement the PRPs made a cash payment to the State in exchange for a release from future environmental liability. As a result, a State funded remedial program is being conducted at this site.

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. The overall remedial goal is to meet all standards, criteria and guidance (SCGs) and be protective of human health and the environment. 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 goals selected for this site are:

- Reduce, control, or eliminate, to the extent practicable, the highly contaminated off-site source area, located in the shallow bedrock north of the railroad tracks.

- Reduce, control, or eliminate, to the extent practicable, the continued migration of contaminated groundwater and dense non-aqueous phase liquid (DNAPL) from the off-site area.

- Reduce, control, or eliminate, to the extent practicable, the continued migration of contaminated groundwater to the surface water drainage system/retention pond, adjacent to the site, at concentrations above surface water standards.

- Eliminate, to the extent practicable, exceedances of groundwater quality standards.

- Eliminate, to the extent practicable, the potential for exposure to contaminated groundwater and/or vapors and/or contaminated surface water.

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 laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Scobell Chemical off-site operable unit were identified, screened and evaluated in the report entitled *Feasibility Study Report, Scobell Chemical Site (Operable Unit #2), dated February 2002.*

The United States Environmental Protection Agency (EPA) has developed policy and procedures for presumptive remedies at sites where commonly encountered characteristics are present. Presumptive remedies are preferred technologies for common categories of sites, based on historical patterns of remedy selection and EPA's scientific and engineering evaluation of performance data on technology implementation. The EPA has: evaluated technologies that have been consistently selected at sites using the remedy selection criteria set out in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP); reviewed currently available performance data on the application of these technologies, and; has determined that a particular set of remedies is presumptively the most appropriate for addressing specific types of sites. The objective of the presumptive remedies initiative is to use past experience to speed up the evaluation and selection of remedial options, to ensure consistency in remedy selection, and to reduce the time and cost required to clean up similar types of sites. The presumptive remedies directive eliminates the need for the initial step of identifying and screening a variety of alternatives during the Feasibility Study. The NCP states that "the lead agency shall include an alternatives screening step, when needed, to select a reasonable number of alternatives for detailed analysis." EPA has analyzed feasibility studies for sites with commonly encountered contamination (i.e., sites with VOC-contaminated soil) and found that certain technologies are routinely screened out based on effectiveness, implementability, or excessive costs, consistent with the procedures set forth in the NCP. Accordingly, EPA has determined that, for sites that meet the requirements of the presumptive remedies directives, site-specific identification and screening of alternatives is not nec

The FS for this site used the following presumptive remedy guidance directives: *Presumptive Remedies: Policies and Procedures*, USEPA Directive 9355.0-47FS, September 1993; and *Presumptive Response Strategy and Ex-situ Treatment Technologies for Contaminated Groundwater at CERCLA Sites*, USEPA Directive 9283.1-12, October 1996.

A summary of the detailed analysis follows. As presented below, the time to implement reflects only the time required to construct the remedy, and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

7.1: Description of Remedial Alternatives

The potential remedies are intended to address the DNAPL and contaminated groundwater present at this operable unit, and by doing so address the continuing source for contaminant migration in surface water and in groundwater further downgradient.

Note that the cost estimates included for all of the alternatives includes a 20% contingency.

Alternative 1: No Action/ Groundwater Monitoring

Present Worth . . . . $ 229,100
Capital Cost . . . . $ 25,200
Annual O&M . . . . $ 32,000 (1st year)
$ 9500 (years 2-30)
Time to Implement . . . . NA

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an un-remediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment. Groundwater monitoring would be conducted. It is assumed that: 1) two additional downgradient bedrock well pairs would be installed; and 2) the four new wells, as well as the thirteen existing off-site wells, would be monitored quarterly for the first year and then annually for up to 30 years.

Alternative 2: Groundwater Extraction and Treatment (via either Air Stripping, Granular Activated Carbon, or UV/Oxidation)

Pump & treat (Air stripping)
Present Worth . . . . $ 2,083,135
Capital Cost . . . . $ 577,860
Annual O&M $81,600
Time to Implement . . . . approximately 3 months
Estimated Time to Completion . . . . 30 years

Pump & Treat (Granular Activated Carbon)
Present Worth . . . . $ 3,420,010
Capital Cost . . . . $ 578,065
Annual O&M $154,060
Time to Implement . . . . approximately 3 months
Estimated Time to Completion . . . . 30 years

Pump & Treat (Ultraviolet Oxidation)
Present Worth $2,028,725
Capital Cost . . . . $ 676,560
Annual O&M $68,300
Time to Implement . . . . approximately 3 months
Estimated Time to Completion . . . . 30 years

This alternative would involve the installation of approximately 8 groundwater pumping wells in the off-site area just north of the railroad tracks. It is assumed that four of the wells would be installed to a depth of approximately 35 feet below ground surface (bgs), approximately 25 to 30 feet into the bedrock; the other four would be installed approximately 70 feet bgs. It is estimated that the system would operate at an average withdrawal rate of approximately 25 - 30 gallons per minute for an estimated period of 30 years. Once removed, the groundwater would be treated on site and discharged to either surface water or the sanitary sewers, as necessary and appropriate.

The shallow bedrock under the railroad tracks is a relatively small area, but most likely contains a significant amount of contamination. In order for the off-site remediation to be more effective, it would be necessary to address the contamination under the tracks. An in-situ remedial technology would be necessary since the area is under an active rail line. Possibilities include, but are not limited to surfactant flushing, enhanced in-situ bioremediation, and in-situ chemical oxidation (ISCO). For the purpose of this ROD, and to develop cost estimates (added to all "active" remedies included in the detailed analysis of alternatives in this ROD), the use of ISCO has been included as the component to address contamination under the tracks (assumed that five wells would be installed along the northern boundary of the on-site area, one to extract groundwater and four to inject the groundwater mixed in a 2% potassium permanganate solution - see Appendix A of the FS for cost estimate/assumptions made). However, the final decision on the method of treatment for this area would be deferred until the Remedial Design.

*[**Note**: This component of the alternative (to address the bedrock under the railroad tracks) has been included in all of the following alternatives, except DNAPL extraction and treatment.]*

This section discusses groundwater extraction and treatment as one alternative. Three different treatment options are potentially applicable for this site including air stripping (volatile organics are partitioned from extracted groundwater by aerating or increasing the surface area of the contaminated water exposed to air; aeration methods include packed towers, diffused aeration, tray aeration, and spray aeration), granular activated carbon (water passes through the carbon system and contaminant molecules are removed from the water by adsorption to the carbon), and ultraviolet oxidation (UV oxidation is a destruction process that oxidizes organic contamination in the water by the addition of strong oxidizers and irradiation with UV light). If groundwater extraction and treatment is selected as the recommended remedial alternative, ***treatment via air stripping would be included so that a cost estimate could be developed***. However, if included as a part of the recommended remedial alternative, the final decision on the method of treatment for the extracted groundwater would be deferred until the remedial design.

Alternative 3: In-Situ Chemical Oxidation (ISCO)

Present Worth	$2,233,780
Capital Cost	$1,959,180
Annual O&M (years 1-10)	$26,700
Annual O&M (years 11-15)	$8,400
Time to Implement	~2 years
Estimated Time to Completion	~15 years

This alternative would involve the installation of a system to inject chemical oxidants into ground water to oxidize contaminants. This is a technology that can be applied at highly contaminated sites or source areas to reduce contaminant concentrations. It is generally not cost effective for plumes with low contaminant concentrations. The common oxidants are hydrogen peroxide-based Fenton's reagent, and potassium permanganate. Fenton's reagent would be produced on-site by adding an iron catalyst to hydrogen peroxide solution. A pH adjustment may be needed, as Fenton's reagent is more effective at acidic pH. For permanganate application, a 1 to 5% solution would be prepared on-site from potassium permanganate crystals that would be delivered in bulk to the site.

For the purposes of this ROD it has been assumed that potassium permanganate would be used as the chemical oxidant. It is assumed that up to 25 additional wells (well locations placed along bedrock fractures based upon results of the geophysical work performed during the OU#2 RI) would be installed to a depth of 35 feet. These wells would be located from just north of the railroad tracks to the area of MW-5S/MW-5D. Approximately five of these wells would be used to extract groundwater, which would be mixed with the potassium permanganate crystals in a 2% solution and then re-introduced to the subsurface through the other 20 newly installed wells. It is assumed that there would be three separate applications; the total time frame for the three applications/performance monitoring would be approximately 2 years.

At the completion of the three applications it is assumed that, although the contaminant concentrations would be significantly reduced, there would be some residual contamination remaining in the groundwater at concentrations above groundwater standards. Therefore, the NYSDEC could also evaluate the need for additional remedial measures and/or property use restrictions to control threats posed by any residual contamination left after the ISCO treatment was completed. For the purposes of this ROD it is assumed that a downgradient groundwater extraction and treatment system (6 wells, 30gpm) would be put in place after the ISCO would have been performed to address the source area. The purpose of this system would be to "contain" the downgradient part of the plume. It is envisioned that the system would be installed downgradient of the treatment area, closer to the northern extent of the RG&E property (towards Blossom Road). Although the groundwater concentrations are much lower in this area they are still present above groundwater standards. Installing a groundwater containment system in this area would minimize the potential for residual contamination to continue to migrate from the site. The cost assumption includes ten years of operation for this system. It is also assumed that the groundwater would be monitored for a period of approximately 15 years (following the completion of the ISCO source area remediation).

This alternative would include a component to address the shallow bedrock under the railroad tracks; a description is included in Alternative 2.

Alternative 4: In-Situ Thermal Treatment

Present Worth	$3,599,255
Capital Cost	$3,460,500
Annual O&M (5 years)	$26,700
O&M Present Cost	$138,755
Time to Implement	~ 6 months
Estimated Time to Completion	~1 ½ - 2 yrs (+ 5 years groundwater extraction & treatment/monitoring)

For discussion purposes, steam has been included, in the text below, as the method for introducing heat into the subsurface. If this alternative is selected as the preferred alternative, the details of the thermal system would be developed during the remedial design and may not necessarily include steam. Other in-situ thermal treatment technologies include radio frequency heating (uses electromagnetic energy to heat contaminated media) and electrical resistance heating (uses an electrical current to heat contaminated subsurface).

This alternative would include the installation of approximately 80-100 steam injection and groundwater/vapor extraction wells across the site. The details of the layout/configuration of the wells would be developed later in the process. Often the configuration of a such a system would involve dividing the area into individual grid areas with steam injection points at the perimeter of the grid and the extraction well in the center of the grid. With this type of system there would be more injection wells; for the purposes of this ROD assume 64-80 steam injection wells and 16-20 groundwater/vapor extraction wells. In addition, it is assumed that 20-30 boreholes would be installed in order to monitor subsurface conditions. The wells would be installed approximately 30-40 feet apart along the bedrock fractures (well locations placed along bedrock fractures based upon results of the geophysical work performed during the OU#2 RI); most of the wells would be installed to a depth of approximately 35 feet; some may be installed deeper so that steam could be introduced below the area where the contaminant concentrations are the highest.

Steam would be injected at the periphery of, and below, the concentrated source area to heat the subsurface. The IST would heat the subsurface to volatilize the contaminants in the bedrock, after which they would be collected by the groundwater/vapor extraction wells. The steam injection would remove contaminants from the groundwater as well as the bedrock matrix, and thus would more fully address the volume of contaminated media in the source area. Contamination would be extracted and collected on-site for off-site disposal.

The thermal system would operate for approximately 12-18 months, after which a long-term groundwater monitoring program would be initiated; it is assumed monitoring would be conducted for approximately five years. Due to the difficulty of addressing the entire contaminant source area present in a fractured bedrock system, IST may not completely remediate the system so that groundwater standards are achieved. Therefore, the NYSDEC could also evaluate the need for additional remedial measures and/or property use restrictions to control threats posed by any residual contamination left after the in-situ thermal treatment was completed. For the purposes of this ROD it is assumed that a downgradient groundwater extraction and treatment system (6 wells, 30 gpm) would be put in place after the in-situ thermal treatment remedy would have been performed to address the source area. The cost assumption assumes five years of operation (estimate for O&M duration is shorter than other alternatives because it is felt there would be less residual mass) for this system. The purpose of this system would be to "contain" the downgradient part of the plume. It is envisioned that the system would be installed downgradient of the treatment area, closer to the northern extent of the RG&E property (towards Blossom Road). Although the groundwater concentrations are much lower in this area they are still present above groundwater standards. Installing a groundwater containment system in this area would minimize the potential for residual contamination to continue to migrate from the site.

This alternative would include a component to address the shallow bedrock under the railroad tracks; a description is included in Alternative 2.

Alternative 5: Enhanced In-situ Bioremediation

Present Worth $2,497,320
Capital Cost $2,349,120
Annual O&M $11,900
Time to Implement . . . . ~ 2 years
Estimated Time to Completion . . . . ~15 years

This alternative would involve the installation of a system to introduce material that would enhance naturally occurring biodegradation processes. Bioremediation is a process that attempts to accelerate the natural biodegradation process by providing such things as nutrients, electron acceptors, competent degrading microorganisms, etc. that may otherwise be limiting the rapid conversion of contamination organics to innocuous end products.

For the purposes of this ROD it has been assumed that up to 250 injection wells (approximately 160 well locations in the area immediately north of the railroad tracks, spaced 10 feet apart, placed along bedrock fractures based upon results of the geophysical work performed during the OU#2 RI; approximately 90 well locations placed downgradient of the first area to address breakdown products) would be installed to a depth of 35 feet. It is assumed that two applications (injection events) would be performed. The total time frame for the two applications/performance monitoring would be approximately 2 years. At the completion of the two applications it is assumed there would be residual contamination remaining in the groundwater. Therefore, it is assumed that the groundwater would be monitored for up to 15 years.

This alternative would include a component to address the shallow bedrock under the railroad tracks; a description is included in Alternative 2.

DNAPL Extraction and Off-site Treatment

Present Worth	$150,600
Capital Cost	$84,600
Annual O&M	$66,000
Time to Implement	~2 months
Estimated Time to Completion	5 years

Since DNAPL is present in the shallow bedrock, physical removal of DNAPL that may be collected in small "pools" could be implemented to address this continuing source of contamination to groundwater. At this site one possible way to address the goal to control migration of DNAPL, possibly in conjunction with some other active remediation, would be to install DNAPL recovery wells in the bedrock. This alternative would include the installation of approximately five DNAPL recovery wells, located along the bedrock fractures north of the railroad tracks. The DNAPL extraction wells would be four inch wells installed approximately 30 feet into bedrock (40 feet below ground surface (bgs)). The wells would be cased/grouted into the top of the competent bedrock with open hole construction in the competent rock. A rough estimate of 1000 gallons of recovered DNAPL, over 5 years, has been included. The recovered DNAPL would be temporarily stored on-site until enough accumulates to be sent off-site for incineration. At the end of the estimated five year period, the system would be evaluated and a determination made on whether to continue/make adjustments to enhance the recovery system, as appropriate.

Since the groundwater extraction and treatment (Alternative 2) and the DNAPL recovery alternatives would be best suited working together, future discussion will combine these two alternatives as Alternative 2.

7.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each of the criteria, a brief description is provided, followed by an evaluation of the alternatives against that criterion. 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. **Compliance with New York State Standards, Criteria, and Guidance (SCGs):** Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance. The most significant SCGs for this site include:

- 6 NYCRR Part 375, Inactive Hazardous Waste Disposal Site Remedial Program
- 6NYCRR Part 700-705, Water Quality Regulations for Surface Water and Groundwater
- NYSDEC Division of Water TOGS 1.1.1
- NYSDOH Sanitary Code Part 5.1 (drinking water standards)
- Air Guide 1 - Guidelines for the Control of Toxic Ambient Air Contaminants

Alternative 1 would not achieve groundwater standards. Alternative 2 would contain the migration of contaminated groundwater and, by doing so, would slowly reduce contaminant concentrations in the groundwater. The length of time for Alternative 2 to achieve SCGs would depend, in part, on the success of the DNAPL recovery system. Due to the difficulty in remediating DNAPL, residuals could remain behind for quite some time. As a result, although groundwater concentrations would be reduced, it may be impossible to achieve groundwater standards.

Both Alternative 3 and Alternative 5 would actively treat the contaminated groundwater. However, the effectiveness of both alternatives depends on the ability for the injected material to come in direct contact with the contaminated groundwater, something that would be difficult in a fractured bedrock aquifer. As a result, it would be difficult/may not be possible to achieve groundwater SCGs for the entire area of the groundwater plume to be treated.

Alternative 4 would heat the subsurface, including the bedrock mass in the treatment area, driving off the VOC contamination for collection; contaminant concentrations in the groundwater would be greatly reduced, with the possibility that groundwater SCGs could be achieved in the treatment area using this alternative.

2. **<u>Protection of Human Health and the Environment</u>**: This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

Alternative 1 would not be protective of human health or the environment. Alternative 2, Alternative 3, Alternative 4, and Alternative 5 would all actively address the on-site groundwater contamination and would offer varying degrees of protection to human health and the environment by reducing the volume and the mobility of the contamination. Alternative 2 would offer some protection by controlling the migration of the contamination, but would not be as effective as some of the other alternatives at addressing/removing the concentrated source area from the environment. Alternative 4 would offer a great deal of protection by addressing the entire volume of contaminated bedrock in the treatment area; Alternative 3 would be effective in addressing the contamination it came in contact with, but delivery of this technology to the entire contaminant volume would be difficult/not possible due to the nature of the fractured bedrock system; Alternative 5 would not be as effective on the concentrated source area (DNAPL) and has the delivery problem mentioned for Alternative 3.

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.

Alternative 1 would result in the fewest short-term impacts, as the only action taken would be groundwater monitoring. Alternative 2 could incorporate an air emission source and a water discharge, however air emissions and the water discharge would be treated to prevent worker and resident exposure to contaminants; there would be some short-term impacts related to handling of the extracted DNAPL, however, proper execution of health and safety procedures would address these potential impacts.

Relative to Alternatives 3 and 5, there would be a potential for worker exposure during installation of the injection wells and the handling of the material to be injected (more so for Alternative 3 for); this exposure potential could be significantly reduced through the use of personal protection equipment. Alternative 4 would pose a small risk to nearby residents that the system would remove VOCs too quickly from the site, overwhelming the treatment system. This risk can be easily controlled through proper design and operation of the technology. For steam stripping, the bulk of the contaminant mass could be removed in a relatively short period of time (estimated at approximately 12-18 months).

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 controls intended to limit the risk, and 3) the reliability of these controls.

Alternative 1 would not provide long-term effectiveness. Alternative 2 would remove contaminants with the contaminants captured by the treatment component of these alternatives. The contaminant concentrations associated with this alternative would be expected to decrease over time, but achieving groundwater standards would not be anticipated for a significant length of time, if at all. It is anticipated that Alternative 3 would be effective in addressing source areas/areas of high contaminant concentrations (not cost-effective to address large areas with relatively low contaminant levels). One of the main limiting factors with this type of technology is the ability for the injected chemical (in this case $KMNO_4$ solution) to come in contact with the contaminated groundwater in order to be effective. In a fractured bedrock aquifer it can be difficult to insure good mixing so that all/most of the contaminated groundwater is addressed.

For Alternative 5, the ability for the injected material to come in contact with the contaminated groundwater would be the major factor limiting the alternative’s effectiveness. Once again, in a fractured bedrock aquifer it can be difficult to insure good mixing so that all/most of the contaminated groundwater is addressed.

Alternative 4 would heat the subsurface to volatilize the contaminants in the bedrock, after which they would be collected by the groundwater/vapor extraction wells. The steam injection would remove contaminants from the groundwater as well as the bedrock matrix, and thus would more fully address the volume of contaminated media in the source area.

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.

Alternative 1 would not actively reduce the volume of contaminants already in the groundwater. Alternative 2 would remove contaminants from the subsurface and treat them, thereby reducing the mobility and volume of contaminants in the groundwater. As discussed above, due to the difficulty in remediating DNAPL, residuals could remain behind for quite some time.

Relative to Alternatives 3 and 5, by treating the groundwater the toxicity of the contaminants in the groundwater in this location would be reduced; by addressing the highly contaminated source area the contaminant mobility would be significantly reduced, and an increase in the volume of contaminated groundwater would be avoid

With Alternative 4, because a significant amount of the contaminant source would be removed under this alternative, there would be a substantial reduction in the volume, toxicity, and mobility of the contamination.

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

Alternative 1 would be the easiest to implement. Alternative 2 would be straightforward to implement, as the systems are commercially available from several vendors. There would be no anticipated administrative or legal barriers to the implementation of Alternatives 3, 4, or 5.

7. **Cost**: Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final dec

A summary of the cost estimates is 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 Proposed Remedial Action Plan have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and the Department’s response to the concerns raised.

There were many questions about the extent of the contamination for the different media. In general the public comments received were supportive of the selected remedy.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is selecting Alternative 4 as the remedy for this site.

This selection is based on the evaluation of the five alternatives developed for this site. Alternative 1 was rejected because it would leave in place high levels of groundwater contamination/DNAPL that would act as a continuing source of contamination for the groundwater. Alternative 2 would be effective at containing this area of contaminated groundwater, but it would take a long period of time to significantly reduce the contaminant concentrations in the groundwater.

Both Alternative 3 and Alternative 5 are promising technologies to address the type of contamination present. However, Alternative 5 is not as effective for the high contaminant levels/DNAPL that is present at the site. Also, for both Alternative 3 and Alternative 5 the conditions present at this site make delivery (to the entire volume to be addressed in the treatment area) of the active remedial components for these alternatives very difficult.

Although the cost estimate is higher than those for the other alternatives, and there will be challenges associated with designing Alternative 4 for this site, this alternative will be more comprehensive in addressing the volume of contamination present in the bedrock, both in the groundwater and the DNAPL present in the bedrock. Specifically, Alternative 4 will be more effective in the long-term, will have the best chance of achieving the remedial objectives in a reasonable time frame, and will provide better overall protection.

The estimated present worth cost to implement the remedy is $3,599,255. The cost to construct the remedy is estimated to be $3,460,500 and the estimated average annual operation and maintenance cost of $26,700 for 5 years corresponding to an O&M present worth cost of $138,755.

The elements of the selected remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS will be resolved.

2. In-situ thermal treatment to address the concentrated source area located in the bedrock/groundwater north of the on-site operable unit (north of the railroad tracks). The remedy will include injection wells, to introduce the heat source, as well as groundwater/vapor extraction wells to remove the mobilized contamination from the bedrock (see Figure 3 for the Conceptual Plan).

3. To address the contamination under the tracks some type of in-situ remedial technology will be necessary since the area is under an active rail line. Possibilities will include, but are not limited to surfactant flushing or in-situ chemical oxidation (ISCO).

4. Due to the difficulty of addressing the entire contaminant source area present in a fractured bedrock system, residuals will remain after the completion of the in-situ thermal treatment. At that time the NYSDEC will evaluate the need for additional remedial measures and/or property use restrictions to control threats posed

by any residual contamination. If property use restrictions are implemented, there will be an annual certification to ensure they are still in place and effective.

5. A downgradient groundwater extraction and treatment and/or in-situ treatment system (e.g., enhanced in-situ bioremediation) will be put in place after the completion of the in-situ thermal treatment of the source area.

6. Since the remedy results in residual contamination remaining at the site, a long-term groundwater monitoring program will be instituted. The details of this program will be coordinated with what will be needed for the on-site operable unit. This program will also monitor the effectiveness of the remedial program.

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

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation (CP) activities were undertaken in an effort 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:

Two document repositories, for documents pertaining to the site, were established.

A site mailing list was established which included nearby property owners, local political officials local media and other interested parties.

In June 2000 a Fact Sheet was prepared, and sent to those people on the site mailing list, to announce the initiation of the Remedial Investigation/ Feasibility Study (RI/FS) at this site.

In February 2002 a Meeting Announcement was prepared, and sent to those people on the site mailing list, to summarize the Proposed Remedial Action Plan (PRAP) for Operable Unit #2 and to announce: 1) the public meeting scheduled to present the PRAP to the public, and 2) the public comment period (February 22 - March 25, 2002) during which people could provide their comments on the PRAP.

In March 2002 a Responsiveness Summary was prepared and made available to the public, to address the comments received during the public comment period for the PRAP.

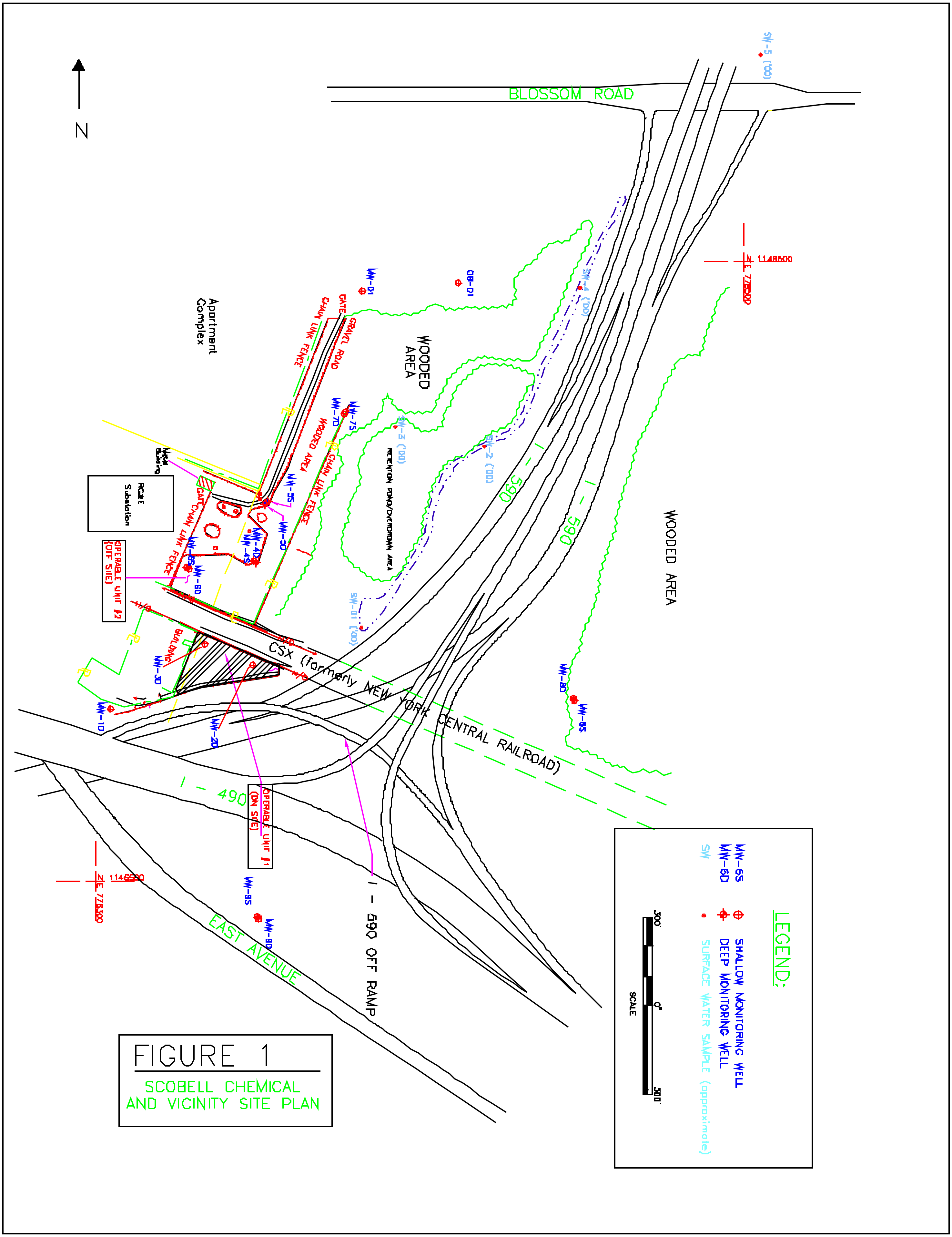
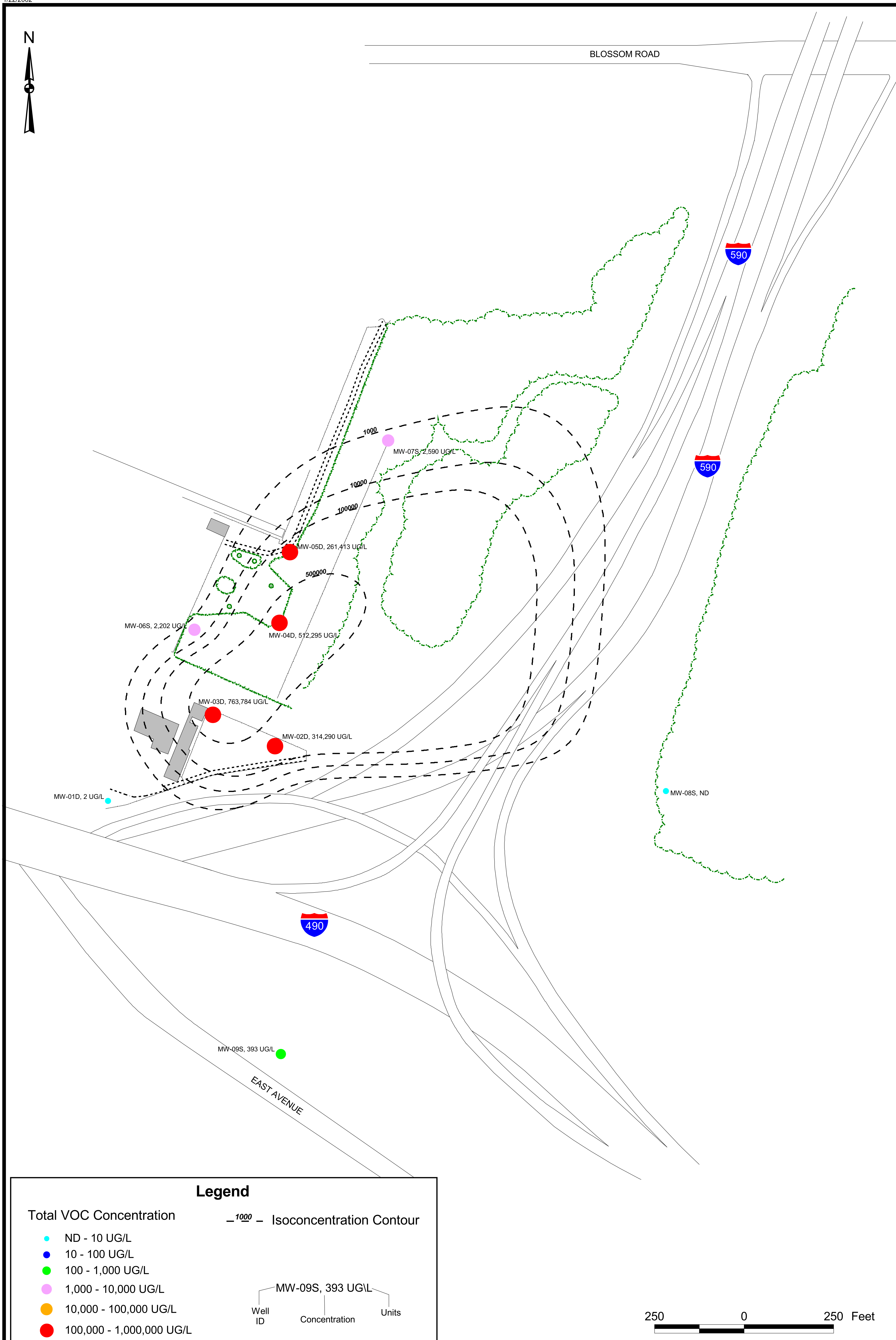


FIGURE 1

SCOBELL CHEMICAL AND VICINITY SITE PLAN

L:\35688.00\db\gis\chemical.apr TOTAL VOCs (INTERMEDIATE)
1/22/2002



URS

TOTAL VOC CONCENTRATIONS - SHALLOW BEDROCK AQUIFER
(NOVEMBER 2000)

FIGURE 2

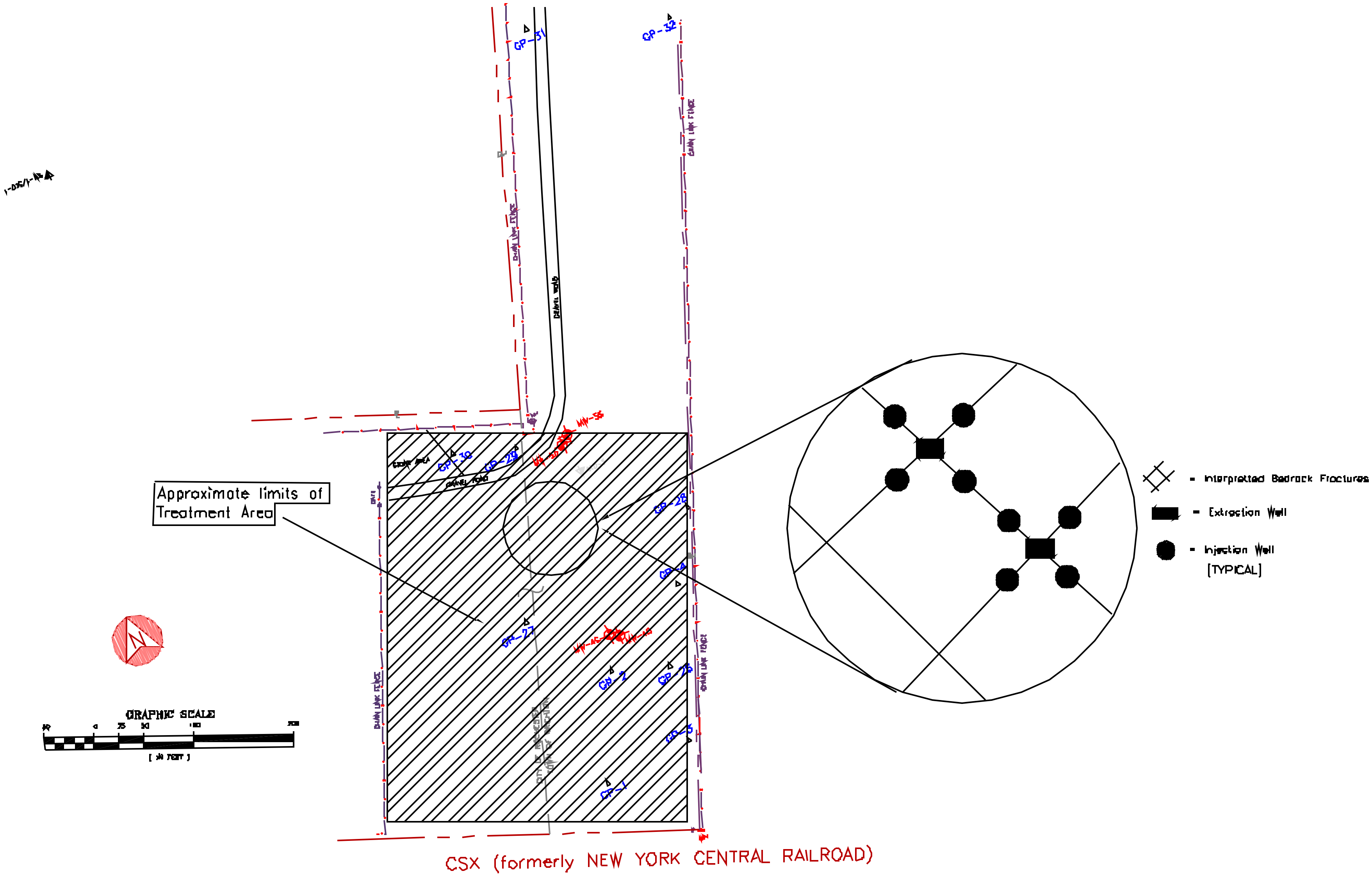


Figure 3 – Conceptual Plan

Table 1
Nature and Extent of Contamination (Off-site - *Based upon OU#2 RI Analytical Data*)

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEDING SCGs	SCG (ppb)
Groundwater from Overburden/ Bedrock Interface	Volatile Organic Compounds (VOCs)	1,1-Dichloroethene	ND - 8	1/3	5
		1,2-Dichloroethene	9 - 4200	3/3	5
		Tetrachloroethene	ND - 140	1/3	5
		Trichloroethene	ND - 3500	2/3	5
		Vinyl Chloride	ND - 100	1/3	2
Shallow Bedrock Groundwater	Volatile Organic Compounds (VOCs)	Benzene	ND - 23	2/6	0.7
		Carbon Disulfide	ND - 130	1/6	50
		1,1-Dichloroethene	ND - 330	2/6	5
		1,2-Dichloroethene	ND - 49,000	4/6	5
		Tetrachloroethene	ND - 21,000	3/6	5
		Toluene	ND - 260	2/6	5
		Trichloroethene	ND - 500,000	5/6	5
		Vinyl Chloride	ND - 750	3/6	2
		Xylene (total)	ND - 100	2/4	5
Deep Bedrock Groundwater	Volatile Organic Compounds (VOCs)	Benzene	ND - 180	3/4	0.7
		Carbon Disulfide	ND - 190	2/4	50
		1,2-Dichloroethene	ND - 3300	2/4	5
		Tetrachloroethene	ND - 28	2/4	5
		Toluene	ND - 13	3/4	5
		Trichloroethene	ND - 370	2/4	5
		Vinyl Chloride	ND - 180	1/4	2
		Xylene (total)	ND - 57	3/4	5
Surface Water	Volatile Organic Compounds (VOCs)	1,2-Dichloroethene	4 - 30	4/5	5
		Trichloroethene	ND - 30	3/5	5
DNAPL [MW-3D]	VOCs	Trichloroethene	780,000	1/1	—

ND=Not detected

Table 2
Remedial Alternative Costs

ALTERNATIVE	CAPITAL COST	PRESENT WORTH of O&M	TOTAL PRESENT WORTH
Groundwater			
1. No Action/ Groundwater Monitoring	$25,200	$203,900	$229,100
2. Pump & Treat (*Air Stripping*)	$577,860	$1,505,275	$2,083,135
Pump & Treat (*GAC*)	$578,065	$2,841,945	$3,420,010
Pump & Treat (*UV/OX*)	$676,560	$1,352,165	$2,028,725
3. In-situ Chemical Oxidation	$1,959,180	$274,600	$2,233,780
4. In-situ Thermal Treatment	$3,460,500	$138,755	$3,599,255
5. Enhanced In-Situ Bioremediation	$2,349,120	$148,200	$2,497,320
DNAPL Recovery (bedrock)			
Extraction and Off-site Incineration	$84,600	$66,000	$150,600

APPENDIX A

Responsiveness Summary

APPENDIX A
RESPONSIVENESS SUMMARY

Scobell Chemical Site, Operable Unit #2
Proposed Remedial Action Plan
Town of Brighton, Monroe County
Site No. 8-28-076

The Proposed Remedial Action Plan (PRAP) for the Scobell Chemical Site, Operable Unit #2, was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on February 18, 2002. This Plan outlined the preferred remedial measu proposed for the remediation of the Scobell Chemical Site, Operable Unit #2. The preferred remedy includes in-situ thermal treatment for the off-site source area, flushing of contaminants in the shallow bedrock from under the railroad tracks, a limited downgradient groundwater treatment system, and long term monitoring.

The release of the PRAP was announced via a notice to the mailing list, informing the public of the PR availability.

A public meeting was held on March 13, 2002 which included a presentation of the Remedial Investiga (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provid an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed reme These comments have become part of the Administrative Record for this site. The public comment pe for the PRAP started February 22, 2002 and ended on March 25, 2002.

This Responsiveness Summary responds to all questions and comments raised at the March 13, 2002 public meeting, as well as to a comment letter received.

Section I: Comments Received at Public Meeting

The following comments were received at the public meeting:

COMMENT 1: The DEC has been diligent in responding to the Town and in expanding the scope of the investigation off-site. The DEC has done a good job. Could you put in perspective for the folks here, w these levels of contaminants are and what these concentrations mean? Also what are the goals and objectives to lower the concentrations? What standards will be used and reached? Finally, how will you keep everyone here in the loop on the subsequent clean up? How will you communicate to everyone h the clean up is going? (From Tim Keef, Brighton Town Engineer)

RESPONSE 1: Looking at Table 1 from the PRAP it is clear that the concentrations found in the bedro are very high. On Table 1 the far right column lists the groundwater standards for the individual contaminants listed; most of them are 5 ppb. Looking at the contaminant concentrations found, the sha bedrock has the highest levels with concentrations of individual contaminants as high as 500,000 ppb (trichloroethene in MW-4D, a shallow bedrock well). There are elevated concentrations in the overburden/bedrock interface and the deep bedrock just north of the tracks, as well as in samples taken little further north-northeast (direction of groundwater flow). However, the highest concentrations are found in groundwater in the shallow bedrock (about 30 feet below the ground) just north of the railroad tracks. Some contamination was seen in surface water in the highway retention pond northeast of the s The highest surface water concentration was found closest to the site (trichloroethene and dichloroeth both at 30 ppb compared to a surface water standard of 5 ppb). A sample taken downstream of the pond adjacent to Blossom Road at the northbound on-ramp to I-590, indicated concentrations below standard

The goal of the remedy is to achieve groundwater standards, but realistically that probably won't happen considering the fact that we have significant contamination/DNAPL in the fractured bedrock. We belie that the remedy selected will be the most effective at addressing the entire volume of contamination pr Although it is not likely that groundwater standards will be achieved, it is believed that the volume of contamination in the environment will be significantly reduced. This will result in a significant reducti contaminant concentrations in the groundwater north of the site as well as removing a large volume of contamination that no longer will act as a source for the off-site migration of contaminants.

As far as future communication with the public, at important stages in the process fact sheets (like the sent to announce this public meeting) will be sent to everyone on the site's mailing list. Fact sheets wi sent at least at the following milestones: once the Record of Decision (ROD) is in place and once the remedial design is nearing completion/before construction of the remedy starts. Additional fact sheets be sent as necessary.

<u>COMMENT 2</u>: When you do the in-situ thermal treatment, how will you filter the contaminants? Will they go in a tank? How will the contaminants be extracted from the ground? How does this work mechanically?

<u>RESPONSE 2</u>: The extraction wells will remove both vapor and water from the bedrock after the steam injected. Once brought to the surface, the contaminated vapors and water will be treated before the cleaned air and water is allowed to be released back to the environment. The concentrated contaminati generated as a result of this treatment will then be disposed of off-site. All of the specifics and the det the remedy will be developed during the remedial design.

<u>COMMENT 3</u>: How many gallons of water will be generated during the in-situ treatment? How many gallons of steam? Will there be lots of steam generated, comparable to a steam plant?

<u>RESPONSE 3</u>: Again, the details of the system will be developed during the design. The bedrock may b de-watered prior to initiating the injection of heat. The Feasibility Study assumed steam would be used the heat source, however other options are available. If steam is used, the Feasibility Study includes a conceptual plan that would use a 12,000 pound/hour steam boiler with an assumed water extraction rate 30 gallons/minute.

<u>COMMENT 4</u>: How long will the treatment take, time wise?

<u>RESPONSE 4</u>: It is assumed that the in-situ thermal treatment system will operate for 12-18 months.

<u>COMMENT 5</u>: Will you use the wells you already drilled to monitor the in-situ treatment?

<u>RESPONSE 5</u>: The wells that are already there would be used as a part of the long-term monitoring program. In addition, more wells are planned downgradient of the current well system (closer to Bloss Road). Also, wells would be installed inside the treatment area to monitor the subsurface conditions (l temperature) during the operation of the treatment system.

<u>COMMENT 6</u>: I live on Yarmouth Road. Our property backs right up to the RG&E substation. How did you decide where to place the monitoring wells? My home is located outside of the circles on you map. I'm concerned about my property and there are no monitoring wells by my property. We also checked the maps at the document repository at the library and there are no wells in our area. Is our property located down hill from the contaminants?

<u>RESPONSE 6</u>: The placement of the off-site bedrock well pairs was determined based on both the groundwater flow direction and on what is called a fracture trace analysis. A fracture trace analysis is performed by examining historical aerial photographs of the area. Subsurface conditions, like bedrock fracture systems, show themselves at the surface and can be seen upon an evaluation of aerial photogra by someone with the appropriate training, expertise, and experience. The groundwater flow direction is the north-northeast; Yarmouth road is located to the west-northwest, so no, your home is not downgrad of the source area. Also, it is important to realize that the off-site contamination is all well below the s with the majority of it present in the shallow bedrock approximately 30 feet down.

<u>COMMENT 7</u>: Why are there no wells by the apartment complex? Were any groundwater studies don nearby the apartments?

<u>RESPONSE 7</u>: During the two phases of the investigation, a number of shallow groundwater samples were collected from the overburden/bedrock interface - the first groundwater encountered below the ground in the area of the site. Some of the samples were collected from geoprobe points installed duri the first part of the investigation back in 1998. Samples were collected to the north of the site in the a between the site and the apartment complex, along the gravel access road for the substation, and approximately 1300 feet to the northeast of the railroad tracks, in the direction of groundwater flow downgradient of the site. All of the overburden/bedrock interface groundwater samples collected betw the site and the apartment complex were below groundwater standards. The sample collected 1300 fee to the northeast of the railroad tracks indicated a concentration of one site related contaminant (dichloroethene) at a concentration of 9 ppb, only slightly above the standard of 5 ppb. Since the area i served by municipal water, the potential exposure pathway in the area of the apartments would be contaminated groundwater getting into basements/sumps and causing elevated indoor air concentration Since the shallow groundwater between the site and the apartments is not contaminated, it was determi that this potential exposure pathway did not exist.

<u>COMMENT 8</u>: Were the sampling points temporary or permanent geoprobe points?

<u>RESPONSE 8</u>: During the Remedial Investigation for operable unit #1, 11 temporary geoprobe points were installed down to bedrock in the area north of the railroad tracks. As a part of both investigations operable units #1 & #2) a total of 9 monitoring wells were installed to the north-northeast of the railro tracks - 3 overburden/bedrock interface wells, 4 shallow bedrock wells, and 2 deep bedrock wells.

<u>COMMENT 9</u>: How deep are the monitoring wells?

<u>RESPONSE 9</u>: The overburden/bedrock interface wells were installed across the surface of the bedrocl which is approximately 8-10 feet below the ground surface. The shallow bedrock wells are approximat 20 feet into the bedrock, approximately 30 feet below the ground surface. The deep bedrock wells are approximately 60 feet into the bedrock, approximately 70 feet below the ground surface.

<u>COMMENT 10</u>: Does the in-situ steam treatment go down deeper than the wells?

<u>RESPONSE 10</u>: Most of the injection/extraction wells will be installed in the shallow bedrock, some w be placed deeper.

<u>COMMENT 11</u>: I also live on Yarmouth Road. I have dampness in my basement. Should I worry about any vapors coming into my basement? Is the water in my basement contaminated?

<u>RESPONSE 11</u>: As discussed relative to the question from the person living in the apartment complex, only way for contamination to get to your basement would be in the shallowest groundwater present at overburden/bedrock interface. The groundwater samples collected from the overburden/bedrock interf between the site and the apartment complex/Yarmouth Road area were all below standards.

<u>COMMENT 12</u>: If I tried to sell my house, do I have to disclose information about Scobell and the contamination?

<u>RESPONSE 12</u>: You should confirm local real estate transaction requirements with your attorney and r estate agent if you decide to sell your house.

[The person expressed this concern because he/she received the fact sheet and wanted to know why the received the fact sheet.] The reason you received the fact sheet about this site is because you are on th mailing list. Receiving the fact sheet does not imply that there are impacts to your property from this

<u>COMMENT 13</u>: What factors are used to determine and prepare your mailing lists?

<u>RESPONSE 13</u>: The mailing list for this site was developed by placing everyone within approximately mile of the site on the list. There are approximately 650 addresses on the mailing list.

<u>COMMENT 14</u>: If the State knew about this contamination since 1988 and reached a settlement with th responsible party in 1995, why did it take so long to notify people that there's a chemical waste site? I wife knew this, she would not have purchased her home nearby. Is there a reason why it took 13 years t get information out about this site?

RESPONSE 14: Once we initiated the Remedial Investigation, a mailing list was developed and periodi fact sheets have been sent out. When the site was initially listed, a notice was sent to the County Clerk Office.

COMMENT 15: I was trying to research the Scobell site on the internet. I saw there are ratings from 1 and this site is listed as a 2. Why isn't there anything recent on the internet? When we went to the Wir Road Library to research the repository, the librarian did not know there was a repository set up there.

RESPONSE 15: The Department's classification system is a characterization of the site. Classificatio categories range from Class 1 to Class 5. A Class 2 site, like this one, is defined as a site that poses a significant threat to human health and/or the environment. The site classification is discussed in Sectio the Record of Decision.

The most comprehensive sources of information for this site are at the two local document repositorie (Winton branch of the Rochester Library and the Brighton Town Library). In February the reference librarians at both libraries were contacted by DEC staff; they are familiar with and are actively maintain the document repositories for this site. Information available over the internet has been steadily expan and Department staff are always available to provide information to concerned or interested citizens.

COMMENT 16: My biggest complaint is that residents need to actively look for information–there's n other way to get it and its not all that forthcoming.

RESPONSE 16: We have sent out fact sheets on this site on a regular basis (the one announcing this public meeting was the fifth since 1998). Included in each fact sheet are the project manager's name a phone number as well as the location of both document repositories. You can always contact the proje manager, Mr. James Moras, at 518-402-9671 with questions.

COMMENT 17: If you can't clean up the site, will there be some sort of buy-back program? Would th State purchase properties impacted by the contamination?

RESPONSE 17: New York does not have a "buy-back" program. Recovering damages caused by contamination from a site is something that would have to be pursued through legal actions against a responsible party for any site. The NYSDEC's/NYSDOH's responsibility is the protection of human he and the environment. If relocation of residents were required for the protection of human health, it wo be done. However, that would be an extreme case that rarely is necessary at a site.

COMMENT 18: Is the Scobell Company bankrupt or dissolved?

RESPONSE 18: Based on the 1995 settlement with the responsible parties for this site, they were not financially viable to do the work that was needed at this site. Effectively, they are bankrupt.

COMMENT 19: Will RG&E be unable to use their property because of the contamination?

RESPONSE 19: RG&E has been, and will continue to use their property. The property use restrictions mentioned in the formal presentation would involve restrictions like preventing someone from installir well in the area where the groundwater is contaminated and/or making sure proper precautions are taker someone does subsurface work into an area where contamination is present.

COMMENT 20: We were planning on using the corner lot (pointed to map) and making a community garden. Is it safe to grow food there? There are lots of Russian immigrants who live in the apartments (Ellison Park Apartments on Bobrich Drive) and are growing vegetables along the fence. Is it safe to do that?

RESPONSE 20: The contamination that has migrated north of the railroad tracks is all well below the ground and would not prevent persons from putting in a vegetable garden near the apartment complex.

COMMENT 21: How often do you sample the wells?

RESPONSE 21: The groundwater has been sampled twice so far, once as a part of the 1998 investigatic and once as a part of the 2000 investigation. During and after the implementation of the remedy more frequent sampling would occur, at least every year with more frequent sampling (probably 4 times a yea occurring during and just after the implementation.

COMMENT 22: I see children playing and people walking their dogs back by the site all the time. Is th a public access area or should it be fenced off? There is a gate there and its always open. If someone h contact with anything back there, is that dangerous? Is it dangerous to be back there?

RESPONSE 22: There is a fence all the way around RG&E's property with a locked gate at the gravel access road that goes out to Blossom Road. The DEC project manager has found the gate locked on the occasions he has been to the site. Regardless, as mentioned earlier, all of the contamination present no of the railroad tracks is below the ground surface and people walking through the area would not be exposed to contaminants. Even at the on-site area south of the railroad tracks the site is fenced and the 6-12 inches of clean soil at the surface.

COMMENT 23: Did I understand this correctly–is the contamination sinking lower because the groundwater is contaminated?

RESPONSE 23: The contamination is sinking lower (the dense non-aqueous phase liquid or DNAPL) because it is present in an amount greater than what could dissolve in the groundwater and the contamin are more dense than water so they sink rather than float on the groundwater.

COMMENT 24: What were the test results from the well that is the farthest from the highway?

RESPONSE 24: The well location referred to is MW-8, located just east of I-590, just north of the interchange with I-490. The groundwater samples collected from this location did not indicate elevate site-related contamination. The other well cluster installed away from the site area during the 2000 investigation was location No. 9 (MW-9S and MW-9D), located approximately 900 feet south-southea of the on-site area. TCE was detected above groundwater standards at MW-9S (140 ppb; this is above standards, by three orders of magnitude (a factor of 1,000) less than what has been detected on-site. It possible that contamination may have been transported to this area in the past as a small “slug” of produ that moved to the south-southeast along bedrock fractures by gravity rather than with groundwater whic flowing to the northeast.

Slightly elevated concentrations of some BTEX compounds (benzene, toluene, ethylbenzene, xylene) v detected in the sample collected from MW-8D, located hydraulically side-gradient from the site area. levels of BTEX compounds were also detected at wells MW-9S/MW-9D, located southeast and hydraulically upgradient of the site. This indicates the site is not the source of this BTEX contaminatic BTEX contamination could be due to small localized spilling of fuel.

COMMENT 25: I have a question regarding Grass Creek and the retention pond and weir beside the highway. Does any contaminated surface water get in these bodies of water? What were the test results the monitoring well by these waterways? What contaminants were found in this well?

RESPONSE 25: Surface water samples were collected from the inlet of the retention pond (south end) two from the midpoint of the pond - one from the west side and one from the east side of the pond, one from the outlet near the weir, and one from just north of Blossom Road next to the north bound on-ram for I-590. The sample at the pond inlet (closest to the site) had the highest concentrations (30 ppb of b trichloroethene and dichloroethene, compared to a standard of 5 ppb); the concentrations decreased downstream with the sample taken next to Blossom Road containing concentrations below surface wat standards.

COMMENT 26: Do you expect the weir and retention pond can be used someday as flood control for the neighborhood? What capacity of water can they hold?

RESPONSE 26: Tim Keef, Brighton Town Engineer answered this question:
The DOT has determined that increasing the capacity of water held in the retention pond would increase water level to a point that would flood portions of the highway just upstream of the pond. The determination made by DOT about the use of the retention pond had nothing to do with the Scobell site

COMMENT 27: Will you treat on or off-site the contaminated water and steam you will be recovering from the ground? Will the treated water be filtered on-site and put back into the ground?

RESPONSE 27: Due to the cost savings associated with on-site treatment, it is anticipated that the extracted vapor and water will be treated on-site with the treated air and water discharged at the site.

COMMENT 28: Was there any evidence of a quarry on-site?

RESPONSE 28: A gentleman in the audience answered this by describing how the canal was built nearb and the stone from this area was used. This stone was used in the canal locks. After the public meeting indicated that rock had been quarried in the past in the area from the retention pond to behind the Sister of Mercy High School (located on the east side of I-590).

<u>COMMENT 29</u>: Would you explain the State Superfund and how the monies are allocated for this project. Would lack of funding effect this clean up?

<u>RESPONSE 29</u>: Up until recently State Superfund projects have been funded by funds from the 1986 Environmental Quality Bond Act (EQBA). The money from this bond act has recently become fully allocated to projects. Legislation to provide new funding for the State Superfund has been proposed fo the last two years. Governor Pataki has again proposed Superfund Reform and Refinancing. Hopefully proposed legislation will be passed some time in the next few months. Until that happens, new funding not be available for State funded projects. This may result in a delay in the schedule for the design and implementation of this project.

<u>COMMENT 30</u>: What are the costs to operate the wells? What is the cost of the remedy, particularly treating the steam?

<u>RESPONSE 30</u>: The cost estimate for the design and implementation of this project is $3.6 million.

<u>COMMENT 31</u>: Is the recommended remedy more expensive than the alternatives?

<u>RESPONSE 31</u>: Yes, the remedy is more expensive than the other remedies evaluated. However, due t the nature of the contamination (high concentrations/DNAPL present in fractured bedrock) a more aggressive approach was considered necessary. The in-situ thermal technology will be the most effecti dealing with the source area north of the railroad tracks.

<u>COMMENT 32</u>: Have you worked out your differences with the DOT and issues of payment on this project?

<u>RESPONSE 32</u>: There is currently a Memorandum of Understanding (MOU) in place between DEC anc DOT to fund the OU1 Remedial Design (RD) and the OU2 RI. As we move to the OU2 RD and the implementation of the remedies for OU1 & OU2, new MOU's will be needed.

<u>COMMENT 33</u>: Will the DNAPL keep settling lower and deeper into the ground and bedrock? Has it sunk deeper since you've been sampling?

<u>RESPONSE 33</u>: DNAPL will continue moving, by gravity, to the lowest point it can move until somethi stops it from moving further. From the sampling data we have collected since 1998, the DNAPL does appear to have moved significantly.

<u>COMMENT 34</u>: How many deep bedrock wells do you have installed? How did you determine where they should be placed?

<u>RESPONSE 34</u>: A total of 4 deep bedrock monitoring wells were installed. The locations of these well were determined based upon the fracture trace analysis discussed above in response #6.

<u>COMMENT 35</u>: Are the wells 60 feet from the surface? Regarding the placement of the wells on the e and south–did you subtract for the surface of the bedrock and bedding planes?

<u>RESPONSE 35</u>: The deep bedrock wells are approximately 60 feet below the surface of the bedrock, approximately 70 feet below the ground surface. The deep bedrock wells were placed to monitor the bedding plane between the Penfield member and the Decew member of the Lockport dolomite. Rock cores, removed as the well was being advanced, were monitored until the depth of this bedding plane ha been achieved. At that point the well was completed.

<u>COMMENT 36</u>: Regarding the DNAPL that's flowing towards the northeast well, was that well sample one or two times?

<u>RESPONSE 36</u>: DNAPL was actually encountered in on-site well MW-3D and MW-4D, located north of the railroad tracks. Both wells were sampled twice, but a DNAPL sample was collected from MW-4 only once.

<u>COMMENT 37</u>: What is the heavy solvent you're trying to locate for clean up? (The DNAPL or TCE? Probably the TCE?) Does it evaporate when exposed to air? Can you evaporate this solvent underground, 30-40 feet below the surface?

<u>RESPONSE 37</u>: The predominant contaminants at the site are tetrachloroethene, trichloroethene, and dichloroethene, with trichloroethene being found in the highest concentrations. All of these contamina heavier than water; trichloroethene was found to be the main contaminant found in the DNAPL as well. of these contaminants are considered volatile organic compounds, or VOCs. When exposed to air they tend to evaporate (volatilize) rather quickly. Thirty feet below the ground, under normal conditions, th contaminants are not exposed to air, so they tend to remain as DNAPL or dissolve in the groundwater. When heat is added, VOCs can volatilize in the bedrock fractures and can be collected by groundwater/vapor extraction wells.

<u>COMMENT 38</u>: Does TCE get mobilized and travel along fractures or will it be captured in the wells?

<u>RESPONSE 38</u>: When heat is added to the subsurface, as a part of in-situ thermal treatment, the contaminants are mobilized, moving from "dead-end" fractures and very small fractures into the larger (relatively speaking) bedrock fractures. Once in the larger bedrock fractures it is easier to remove the contamination through the extraction wells.

<u>COMMENT 39</u>: Is the in-situ thermal treatment used successfully in other locations? Was it used in th falls (assumed to be referring to Niagara Falls)?

<u>RESPONSE 39</u>: The application of this technology to hazardous waste sites is still relatively new. The U.S. Department of Defense is using it at some of their sites; a site in the Rochester area will be implementing in-situ thermal treatment in the same bedrock formation in the near future. The oil indus used this type of technology to remove oil from the subsurface for quite some time with a great deal o success.

COMMENT 40: What is the steam like? Is it superheated or low pressure? Is it just like steam used in train?

RESPONSE 40: The steam used will be low pressure steam at a temperature of approximately 212 degrees F.

COMMENT 41: Will evaporating the chemicals be noticeable in the air? Will we smell things during t clean up? When the contaminants are being treated at the surface, should we all be indoors or will it be to be outside? I hope it won't smell outdoors like the plant used to in the 1960-70's!

RESPONSE 41: No, the removal of the contaminants will be done in a closed vessel system and the air/vapors will be treated before being discharged to the atmosphere, so there should be no smell.

COMMENT 42: Do you have a list of the chemicals that Scobell handled and processed? Did Scobell handle or process mercury or other metals?

RESPONSE 42: We do not have a comprehensive list of all of the material handled by Scobell Chemica However, samples from the site have been analyzed for an extensive list of chemicals. Based on the re of these analysis a list of contaminants of concern was developed as a part of the Remedial Investigatio This list is made up of VOCs, with the predominant contaminants discussed in response #38, above.

COMMENT 43: I work with a City firefighter responsible for the site area. It used to be terrible there. The company used to just dump chemicals out the back door. They also used to burn chemicals at nigh

RESPONSE 43: This comment is acknowledged. The NYSDEC cannot confirm this information. It is included to document what was offered by a member of the public in attendance at the public meeting.

Section II: Written Comments Received

A letter dated January 23, 2002 was received from Mr. Mauricio Roma, NYSDOT which included the following comments on the PRAP (page and section of the PRAP specifically referenced at the beginn each comment):

COMMENT 44: *Page 1, Section 1, Paragraph 2 (a significant...).* This paragraph indicates that the Scobell site is a significant threat to human health associated with the installation of (water supply) wells. To our knowledge, we are not aware of any groundwater wells used for drinking, or other domestic use, that could result in significant human exposure to the contaminants of concern. If such wells exist, please let us know. The presence of potential contaminant receptors is very important for choosing and designing a remedial action plan.

RESPONSE 44: The statement made in the PRAP (relative to significant threats posed by the Scobell Chemical site) was "a significant threat to human health associated with 1) the potential for exposure to contaminated groundwater if wells were to be installed in the plume...". The area is served by public water and there are no wells currently used in the area. However, if someone were to install a well or well point in the plume in the future, there would be an exposure issue. The statement uses the words "threat" (rather than actual exposure) and "potential" and, as stated, it is accurate.

COMMENT 45: *Page 5, Section 4.1.1, Paragraph 3 (Overburden groundwater...).* This paragraph discusses hydraulic conductivities in the overburden and the bedrock. The value of the hydraulic conductivity (K) is important in selecting a remedial action. We believe that the bedrock K values shown in the PRAP may be inaccurate because, according to NYSDEC, 2001, they were obtained by the slug test method which ***assumes*** that the aquifer is a porous media. The aquifer at Scobell is fractured carbonate rock (Lockport Formation). The K values shown in the PRAP are useful to determine relative order of magnitude estimates (NYSDEC, 2001. Page 3-7). The true hydraulic conductivity of the site bedrock is possibly higher for the following reasons:

The average yield of 56 wells tapping the upper and middle parts of the Lockport Formation is 31 gallons per minute (gpm). Wells at Medina (about half way between Niagara Falls and Rochester) may yield over 100 gpm. (USGS, 1964). The transmissivity (T) value of 2,300 gpd/ft., derived from an analysis of data from the Niagara Falls conduit excavation, is probably the most representative value for the Lockport as a whole (USGS, 1964).

This US Geological Survey report shows that the T at a well where the total thickness of Lockport is 38 feet, the T is 1000 gpd/ft. Therefore, the hydraulic conductivity (K) is about 1.2 x 10(-3) cm/s. Note that the T of the upper part of the formation is higher in the upper Lockport than the middle or lower Lockport (USGS, 1964). Considering that the most contaminated portion of bedrock at the site is the upper Lockport (DEC, 2001) it is possible that the true overall K is closer to 10(-3) cm/sec.

RESPONSE 45: Flow in fractured media is typically described by the Cubic Law, which relates the flow rate to the number of joints and their aperture. In practice, both of those parameters are unknown because of the difficulty of measurement. Fortunately, the form of the Cubic Law is identical to that of the Darcy's Law (that is, flow is expressed as a product of a constant, a hydraulic gradient and a cross sectional flow area). Therefore, for practical purposes, flow in a fractured medium can be represented by the flow in an "equivalent" porous medium. The notion of "equivalence" refers to the porous medium capable of conducting the same flow as the fracture medium in question, under the same hydraulic gradient through the same cross sectional area. In other words, the constant of the Cubic Law is expressed as hydraulic conductivity (or transmissivity), which is also a constant. For a good discussion of this issue, see for example *Physical and Chemical Hydrogeology* (Domenico and Schwartz, 1990, John Wiley and Sons). Figure 3.18 contains a conversion from a fracture medium, based on the number of joints per unit formation thickness and the joint aperture, to the hydraulic conductivity of an equivalent porous medium. Both would transmit the same amount of water under the same gradient.

Treating a fracture medium as an equivalent porous medium is a legitimate method when it comes to calculating ground water flow rates.

At the Scobell site, the only available data are from slug tests, which measure small-scale values of transmissivity. It is well established that regional values of transmissivity may be different from local, small-scale values, especially in a fractured aquifer. This will be taken into account in the process of designing the remedy.

It is also possible that small-scale values at the site, as measured by means of slug testing, are representative of site-wide transmissivity. Note that several of the wells installed during the investigation produced water at very low rates and recovered very slowly (MW-7D), and in some cases more than 24 hours (MW-9D). This suggests that the transmissivity in some portions of the site is low.

COMMENT 46: *Section 4.2, Page 8.* We are not aware of known Human Exposure Pathways. If any are known, this should be stated. Otherwise the description of pathways should indicate that these are potential and not known pathways. This section, as written, could cause unnecessary alarm to the public. To better determine exposure pathways it may be a good idea to perform a soil gas survey and measure VOC concentrations at a few points near inhabited buildings. A PID could be cost effective since it can detect a wide range of VOCs, including TCE.

If there are known human exposure pathways, please let us know so we can provide suggestions on the type of remedial action needed at this site, including design concepts.

RESPONSE 46: There are no exposure pathways which are currently completed pathways. The text of the PRAP neither states that there are, nor does it imply that there are completed pathways. The summary of the human exposure pathway analysis begins with the following statement: "Pathways which are known to or may exist at the site include"; in the three bullets that follow this statement the following phrases are used: first bullet - "...could occur if..."; second bullet - "..there is the potential..."; third bullet - "...site presents the potential...".

Relative to the need for a soil gas survey, it was determined not to be needed at this time based, in summary, on information included in the response to comment #7 from the 3/13/02 public meeting (presented above). The backup information which supports response #7 is included in the RI Report.

COMMENT 47: *Section 6, Page 8.* The overall goal (to meet Standards and Guidance Values) is often difficult or, sometimes, impossible to achieve (especially for highly contaminated sites). The PRAP should mention this. At other sites, some with very sensitive human and environmental receptors, we work with NYSDEC and NYSDOH to select cleanup objectives. Our intent is to try to exceed the objectives, but sometimes it is not possible. We noted that the last paragraphs of this section (in bullets) imply that the overall goal may not be achieved.

RESPONSE 47: At any site the ultimate goal is to return the site to pre-release conditions. The PRAP does mention that it will be difficult, if not impossible to achieve groundwater standards. In Section 1 a statement is made that residuals will remain after the in-situ thermal treatment; Section 7.2 presents the evaluation of the alternatives and indicates, several times, that groundwater standards will be difficult, if not impossible to achieve; Section 8, in the presentation of the proposed remedy, paragraph 4 states that "Due to the difficulty of addressing the entire contaminant source area present in a fractured bedrock system, residuals would remain after the completion of the in-situ thermal treatment. At that time the NYSDEC would evaluate the need for additional remedial measures and/or property use restrictions to control threats posed by any residual contamination."

Section 6 of the PRAP presents the site specific remediation goals for the Scobell Chemical site.

COMMENT 48: *Section 7.1, Pages 10 thru 14.* Air Sparging as an enhancement for Soil Vapor Extraction should be evaluated in the PRAP as a remedial alternative. The EPA (1997) has cited this remedial action as an effective technology for the remediation of halogenated hydrocarbons in fractured limestone.

RESPONSE 48: The Feasibility Study (FS) could not evaluate every available remedial technology, but it did evaluate an appropriate and wide range of alternatives. The presence of a highly concentrated source area, with DNAPL in the fractured bedrock, presents a very difficult situation to remediate. Air sparging would have the same difficulty with effectiveness as an alternative like in-situ chemical oxidation (an alternative evaluated in the FS) would; that is, in order to be successful direct contact with the entire contaminant mass is needed. In the fractured bedrock system present below this site this would not be possible.

In addition, in-situ thermal treatment is effectively "hot" air sparging which includes vapor and water extraction from the subsurface. The heat mobilizes the contaminants from the dead-end fractures and the relatively small fractures so the extraction system will be much more successful in collecting the contaminants.

COMMENT 49: *Section 7.1, Page 10 (Groundwater Extraction and Treatment; P&T).* We believe that this technology is feasible in areas where contaminant concentrations in groundwater are very high or where free product is present in the saturated zone. This technology is widely used to remove free product and highly contaminated groundwater (e.g., areas where concentrations are over 100,000 ug/l). As concentrations decrease, the use of surfactants can enhance the recovery of contaminants. As concentrations continue to decrease, other remedial actions may be needed to achieve cleanup objectives at the source, or near source, areas. We understand that the State has not yet found a funding source to implement a remedial action. We suggest that if limited funding is identified, priority should be given to the removal of DNAPL and highly contaminated groundwater using P&T, a proven technology for this purpose.

RESPONSE 49: The use of groundwater pump and treat to address highly concentrated source areas with DNAPL would take a very long time to be successful, if success would be possible at all. The following quotes are examples to document the current technical approach being taken to be more aggressive in addressing DNAPL contamination: (1) "The Federal Remediation Technologies Roundtable has developed a national action plan for accelerating the development and implementation of innovative technologies for remediating Dense Non-Aqueous Phase Liquids (DNAPLs) in ground water… The focus of the new initiative is on sites contaminated with free DNAPL product at which current technologies (particularly pump and treat systems) take too long to meet national needs."[taken from the following article: "Federal Roundtable Proposes National Action Plan for DNAPL Source Reduction", by Jim Cummings, U.S. EPA Technology Innovation Office; as included in Ground Water Currents, March 2000, Issue No. 35]. (2) "The ability to identify the location of and remediate DNAPLs is the subject of much debate. It was previously thought that the pump and treat technology could be used for DNAPL remediation. It is now widely accepted that pump and treat is not an effective remediation technology for DNAPL, but can provide contaminant plume control." [taken from the following article: "DNAPLs present a remediation puzzle", By David Fleming, printed in The Seattle Daily Journal of Commerce - Environmental Outlook section, dated August 20, 1998].

In general, surfactant flushing is a promising technology to address DNAPL contamination. However, as discussed above, and as discussed in the FS, in order for a technology like surfactant flushing to be successful it would need to come in direct contact with the contamination. In the fractured bedrock below the Scobell Chemical site this would not be possible for much of the contamination present in the smaller fractures and in "dead-end" fractures. In-situ thermal treatment has the advantage of heat distributing itself directly through the fracture system, as well as through the bedrock itself via conduction, addressing much more of the volume of bedrock affected by the contamination.

Relative to the funding portion of the comment, there is currently no funding available for the next phases of this project, whether it would be for an interim remedial measure (IRM) or for the full scale remedy. When that situation changes the program can move forward. As far as the remedy selected, technical decisions are made based on what is needed to remediate the site and provide protection of human health and the environment, regardless of the funding source(s) or lead responsibilities for the site.

COMMENT 50: *Section 7.1, Page 12 (In-Situ Thermal).* Based on the references that we have, it appears that this technology may not be an efficient remedial action for removing contaminants at this site. It is also possible that this technology could contribute to additional negative environmental impact at the site by forcing TCE and other contaminants into previously unaffected, or little affected, rock strata. The EPA (1997) has indicated that this technology is **limited** for soils with moderate to high permeability. At this site, contaminated groundwater is, for the most part, in fractured limestone/dolostone. In addition, the EPA (1997) has indicated that a confining layer is especially important for applications when steam stripping is used to remove DNAPL (dense non-aqueous phase liquid) to prevent contamination from migrating vertically downwards. We are not aware of any confining layers within the Lockport Formation to prevent DNAPL migration into deeper areas of this rock formation.

To heat rock and groundwater would likely require large amounts of energy which, in addition to the very high cost, may have an adverse impact to our global environment unless the energy comes from renewable sources. The EPA (1997) has also indicated that high soil temperatures can delay use of the site or inhibit natural biodegradation of the residual contamination.

The Federal Remediation Technologies Roundtable (chaired by the EPA; www.frtr.gov) has determined that steam flushing/stripping is a pilot-scale technology primarily used for the removal of semivolatile organic compounds (SVOCs) and fuels. There are more cost-effective processes for sites contaminated with VOCs (such as those present at the Scobell site).

RESPONSE 50: The extraction well network will provide "confinement" and prevent contamination from migrating away from the treatment area. The point of this technology is to mobilize the contamination; once mobilized this contamination will be driven towards, and removed through, the extraction well network. The remedial design will evaluate subsurface conditions and design an extraction well network that will provide the needed hydraulic and vapor containment and collection system.

It is understood that a great deal of energy will be needed as a part of the in-situ thermal treatment system at this site. Due to the significant amount of uncontrolled contamination present in the subsurface at this site, it was determined that an aggressive source area remedy was needed to provide protection to human health and the environment in the long-term. The treatment area property is currently an open field owned by Rochester Gas & Electric (RG&E) adjacent to one of their electrical substations. We have been in close contact with RG&E through this process, and will continue to be as the project progresses. The property will continue to be "used" in the future. If follow-up treatment of residual contamination via biodegradation is needed, enhanced in-situ bioremediation would allow for the creation of conditions to allow for biodegradation of residuals at a much faster rate than natural biodegradation.

For aqueous phase VOC contamination there are more cost effective treatment technologies. However, for DNAPL present in a fractured bedrock system, those technologies would not be very effective due to the difficulties in removing the contamination (e.g., for groundwater pump and treat) or delivering the system to the entire contaminant mass (e.g., in-situ chemical oxidation).

As discussed/quoted in Response #6, above, "The Federal Remediation Technologies Roundtable has developed a national action plan for accelerating the development and implementation of innovative technologies for remediating Dense Non-Aqueous Phase Liquids (DNAPLs) in ground water." "The Roundtable is an interagency group that undertakes cooperative efforts to promote greater application of innovative technologies for site cleanup. Its members include the U.S. EPA, the U.S. Departments of Defense (DoD), Energy (DOE) and Interior (DOI), the U.S. Geological Survey (USGS) and the National Aeronautics and Space Administration (NASA)." "The focus of the new initiative is on sites contaminated with free DNAPL product at which current technologies (particularly pump and treat systems) take too long to meet national needs... The Roundtable has identified three technology classes as having potential to greatly augment, if not replace, pump and treat systems, the most common DNAPL remediation methods. These are in situ thermal, surfactant flushing, and chemical oxidation."[taken from the following article: "Federal Roundtable Proposes National Action Plan for DNAPL Source Reduction," by Jim Cummings, U.S. EPA Technology Innovation Office; as included in Ground Water Currents, March 2000, Issue No. 35]. Although surfactant flushing and in-situ chemical oxidation are promising technologies, due to the nature of the fractured bedrock below this site it was determined that in-situ thermal treatment would be more effective in treating a much greater volume of the source area.

COMMENT 51: We understand that the NYSDEC is planning to implement in-situ thermal groundwater remediation at the Chemical Sales Corp. site (NYSDEC ID # 828086) which has significant similarities to the Scobell site. If this action is implemented we would like to evaluate its performance and consider it as a potential remedial action for the Scobell site.

RESPONSE 51: The information gathered as a part of the Chemical Sales design will be used during the design of the remedy for Scobell Chemical OU2. This information will be available for your review, once available.

APPENDIX B

Administrative Record

Administrative Record
Scobell Chemical Site, Operable Unit #1
Monroe County
Site No. 8-28-076

1. File Index.

2. Record of Decision - OU1, prepared by NYSDEC, dated March 31, 1999.

3. Proposed Remedial Action Plan - OU1, prepared by NYSDEC, dated February 1999.

4. RI/FS Work Assignment; letter dated February 10, 1998 from R. Lupe (NYSDEC) to P. Petrone (Parsons Engineering Science).

5. Oversized figures summarizing sample locations/results from 1988 NYSDOT subsurface soil sampling.

6. Environmental Report, prepared by Erdman Anthony, Associates, dated October 1988.

7. Results from May 5, 1992 surface water/sediment samples, dated May 13, 1992.

8. Letter report, from Seeler Associates to NYSDEC, presenting results from samples taken at Blossom Village Apartments construction site, dated May 18, 1995.

9. Site Investigation Work Plan, prepared by Parsons Engineering Science, dated May 1998.

10. Remedial Investigation Report, prepared by NYSDEC, dated February 1999.

11. Feasibility Study Report, prepared by NYSDEC, dated February 1999.

12. Citizen Participation Plan, prepared by NYSDEC, dated February 1998.

13. Fact Sheet, issued by NYSDEC, dated February 1998.

14. Public Meeting Announcement, prepared by NYSDEC, dated February 1999.

15. (confidential file) NYSDEC Site Referral Memorandum dated February 6, 1997 from C. Sulliva to M. O'Toole.

Administrative Record
Scobell Chemical Site, Operable Unit #2
Monroe County
Site No. 8-28-076

16. File Index - OU2.

17. Record of Decision - OU2, prepared by NYSDEC, dated March 2002.

18. Proposed Remedial Action Plan - OU2, prepared by NYSDEC, dated February 2002.

19. RI/FS Work Assignment; letter dated July 21, 1999 from R. Lupe (NYSDEC) to J. Gorton (URS Consultants).

20. Site Investigation Work Plan, prepared by URS Consultants, dated October 1999.

21. Memorandum of Understanding between the New York State Department of Transportation and the New York State Department of Environmental Conservation for Investigation (OU2) and Design (OU1) Services for the Scobell Chemical Site, dated May 30, 2000 (date of execution b DOT).

22. RI/FS Work Assignment Notice to Proceed; letter dated July 3, 2000 from M. O'Toole (NYSDEC) to J. Gorton (URS Consultants).

23. Remedial Investigation Report for OU1 and OU2, prepared by NYSDEC, dated February 2002.

24. Feasibility Study Report for OU2, prepared by NYSDEC, dated February 2002.

25. Fact Sheet, issued by NYSDEC, dated June 2000.

26. Public Meeting Announcement, prepared by NYSDEC, dated February 2002.