EPA/ROD/R02-__/___
2008

EPA Superfund
Record of Decision Amendment:

MOHONK ROAD INDUSTRIAL PLANT
EPA ID: NYD986950012
OU 01
HIGH FALLS, NY
09/29/2008

RECORD OF DECISION AMENDMENT

Mohonk Road Industrial Plant Superfund Site

Hamlet of High Falls,
Towns of Marbletown and Rosendale
Ulster County, New York

United States Environmental Protection Agency
Region 2
New York, New York
September 2008

DECLARATION FOR THE RECORD OF DECISION AMENDMENT

SITE NAME AND LOCATION

Mohonk Road Industrial Plant Site
Superfund Identification Number: NYD986950012
Hamlet of High Falls, Towns of Marbletown and Rosendale,
Ulster County, New York

STATEMENT OF BASIS AND PURPOSE

This decision document presents the amended remedy for the Mohonk Road Industrial Plant (MRIP) Superfund Site, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended,42 U.S.C. §§ 9601-9675 and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for amending the remedy for the Site. The information supporting this remedial action decision is contained in the Administrative Record. The index for the Administrative Record is attached to this document (APPENDIX III).

The New York State Department of Environmental Conservation (NYSDEC) concurs with the amended remedy. A letter of concurrence from NYSDEC is attached to this document (APPENDIX IV).

ASSESSMENT OF THE SITE

The response action selected in this Record of Decision Amendment (ROD Amendment) is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment at or from the Site.

DESCRIPTION OF THE SELECTED REMEDY

The amended remedial action described in this document addresses contaminated groundwater at the Mohonk Road Industrial Plant Site. The Site includes the Mohonk Road Industrial Plant property (MRIP Property) as well as those areas impacted by the groundwater plume emanating from the property. This remedial action amends the selected remedy presented in the March 31, 2000 Record of Decision (ROD) and undertaken by EPA to address Site groundwater. The primary change in the groundwater remedy is associated with replacing the active extraction and treatment of groundwater from within the far field plume with monitored natural attenuation.

Amended Groundwater Remedy

The amended groundwater remedy includes:

- o Monitored natural attenuation within the far field plume to restore the aquifer to its most beneficial use (as a potable water supply), and continued extraction of contaminated groundwater in the near field plume on the MRIP Property, subsequent treatment with an air stripper and activated carbon adsorption, and discharge of the treated water to Coxing Kill Creek. The near field plume refers to that portion of the groundwater plume with total volatile organic compound (VOC) concentrations greater than 1,000 parts per billion (ppb), while the far field plume has been updated to refer to the portion of the groundwater plume with total VOC concentrations from 5 ppb to 1,000 ppb.

- Implementation of a groundwater monitoring program to evaluate groundwater conditions and the effectiveness of the components of the remedy.
- Institutional controls in the form of existing governmental controls to prevent future use of the aquifer as a drinking water source in the impacted or threatened area. These institutional controls would no longer be necessary following the restoration of the groundwater to beneficial use.
- Continued operation of the Site soil vapor extraction system and vapor mitigation system.

The ROD included an alternate water supply as part of the groundwater remedy, and also specified a source control action. Since the issuance of the ROD, the source control and alternate water supply actions have been implemented. This ROD Amendment focuses only on that portion of the selected remedy (dealing with groundwater) to which a fundamental change is warranted, and the rationale for such change.

DECLARATION OF STATUTORY DETERMINATIONS

The modified remedy meets the requirements for remedial actions set forth in CERCLA §121. It is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable, and the groundwater remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., it reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment). Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, but will take more than five years to attain remedial action objectives and cleanup levels in the groundwater, a policy review will be conducted no less often than once every five years after completion of the construction of the remedial action components for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

DATA CERTIFICATION CHECKLIST

The Decision Summary for this ROD Amendment contains the remedy selection information noted below. More details may be found in the Administrative Record file established for the MRIP Site.

- o Chemicals of concern (COCs) and their respective concentrations (see Appendix II);
- o Baseline risk represented by the COCs (see page 11 herein; also see pages 18 through 24, and Tables 8 through 13 on pages 11-44 through 11-64 of the ROD);
- o Cleanup levels established for chemicals of concern and the basis for these levels (see Appendix II; also see pages 15, 23, 25 and 26 herein, and Table 14 on page 11-65 of the ROD);
- o How source materials constituting principal threats are addressed (see page 48 of the ROD);
- o Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (see page 10 herein; also see pages 17 and 18 of the ROD);
- o Potential land and groundwater use that will be available at the Site as a result of the selected remedy (see page 23 herein; also see pages 54 and 55 of the ROD);
- o Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (see Appendix II herein); and,
- o Key factor(s) that led to selecting the remedy (i.e., how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision)(see pages 20-23 herein).

AUTHORIZING SIGNATURE

______________________________ ____________

George Pavlou, Acting Director   Date
Emergency & Remedial Response Division

DECISION SUMMARY

Mohonk Road Industrial Plant Superfund Site

Hamlet of High Falls,
Towns of Marbletown and Rosendale
Ulster County, New York

United States Environmental Protection Agency
Region 2
New York, New York
September 2008

TABLE OF CONTENTS

SITE NAME, LOCATION AND DESCRIPTION

The Mohonk Road Industrial Plant (MRIP) Superfund Site (the Site) is located in the Hamlet of High Falls, Ulster County, New York, approximately seven miles north-northwest of the Village of New Paltz and ten miles south- southwest of the City of Kingston. The Hamlet of High Falls is situated within two townships; the Towns of Marbletown and Rosendale (see Figure 1). The Site was added to the National Priorities List (NPL) on January 19, 1999; the Superfund identification number for the Site is NYD986950012. The New York State Department of Environmental Conservation (NYSDEC) served as the lead agency for the Remedial Investigation and Feasibility Study (RI/FS) which was initiated prior to the Site being placed on the NPL. The United States Environmental Protection Agency (EPA) assumed the role as lead agency with issuance of the Record of Decision (ROD) on March 31, 2000.

The Site includes a facility located at 186 Mohonk Road (the MRIP Property), and all surrounding properties that have been impacted by the contaminated groundwater plume. The MRIP Property originally consisted of approximately 14.5 acres of mostly undeveloped land with a 43,000 square foot building in its southern corner. As part of the water supply remedy, and consistent with the ROD, 6.9 acres of the northern property were conveyed by the Kithkin Corporation on August 19, 2005 to the High Falls Water District. This northern portion of the property is now the location of the High Falls Water District's drinking water treatment plant.

The Site-related groundwater plume extends approximately 4,000 feet downgradient from the MRIP Property, and had adversely impacted at least 75 residential and commercial water supply wells. Residents and businesses within the area are now obtaining their potable water from the High Falls Water District, a publicly-operated water supply system. The "near field plume" as historically defined in the ROD refers to that portion of the groundwater plume with total volatile organic compound (VOC) concentrations greater than 1,000 parts per billion (ppb), while the "far field plume" refers to the component of the groundwater plume between 10 ppb and 1,000 ppb total VOCs. Figure 4 depicts the current extent of the plume boundary to the 5 ppb total VOC concentration. The entire near field plume is currently within the estimated capture zone of the existing groundwater extraction and treatment system.

The Site is located in an area of primarily residential development. Industrial activities took place on the MRIP Property from the early 1960's until approximately 1992. The MRIP Property is currently zoned for light industrial use, is currently used for non-industrial commercial purposes, and the most reasonably anticipated future use for the MRIP Property is commercial and light industrial use.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

History

From the early 1960's to 1972, Varifab, Inc., a metal finisher, owned and occupied the Site and reportedly used solvents in the finishing and assembly of metal parts for card punch machines and computer frames. From 1972 to 1975, a wet spray painting company, R.C. Ballard Corp., operated at the Site. This type of painting operation would require large quantities of solvents in order to clean surfaces prior to painting. The Site was purchased in 1976 by Daniel Gelles; Daniel E. Gelles Associates, Inc. manufactured store display fixtures which may have involved the use of solvents. Wastes from these operations were typically discharged into a septic tank on the MRIP Property. Banco Popular de Puerto Rico foreclosed on the MRIP Property in 1992. A portion of the Site is currently owned by Kithkin Corp., which purchased the property at auction in 1993 and currently leases portions of the building to various commercial tenants.

The Site first came to the attention of state and local authorities in April 1994, when a resident near the MRIP Property contacted the Ulster County Health Department (UCHD) regarding the quality of her drinking water. The resident's well was sampled in April 1994 by UCHD, and the sample was found to contain levels of VOCs above federal and/or New York State (NYS) Maximum Contaminant Levels (MCLs) for drinking water. Subsequent sampling performed by UCHD identified 70 other homes or businesses downgradient of the Site with VOCs above the aforementioned standards for drinking water. NYSDEC began investigating the Site in 1994. As an interim action to address immediate health threats, NYSDEC installed point-of-entry treatment (POET) systems at homes or businesses whose potable water supply exceeded the NYS MCLs (5 ppb) for the individual VOCs. These systems included particulate filters, granular activated carbon (GAC) for VOC removal, and ultraviolet (UV) oxidation for disinfection. Monitoring of private wells on the perimeter of the plume was instituted to ensure that impacts to previously unaffected private wells downgradient of the Site would be addressed. As a result of the ongoing monitoring program, five additional homes and businesses were ultimately supplied with POET systems. In 1994, NYSDEC designated the Site as Class 2 on the NYS Registry of Inactive Hazardous Waste Sites, indicating that the Site posed a significant threat to public health and the environment.

In the fall of 1996, NYSDEC assessed subsurface conditions within five suspected disposal areas. Investigations included geophysical surveys, soil gas screening, soil borings, and monitoring well installation. Samples of surface soils, subsurface soils, groundwater, and soil vapor, and water and sludge samples from within an abandoned 1,000-gallon septic tank (referred to within the ROD as the "disposal tank") located north of the MRIP building, were collected. Two sources of VOC contamination were identified on the MRIP Property, including (1) subsurface soil beneath the gravel driveway at the western end of the MRIP building, and (2) the abandoned septic tank (see Figure 2). Additionally, VOC concentrations above MCLs were detected in groundwater.

In the fall of 1996, NYSDEC contracted Lawler, Matusky & Skelly Engineers LLP (LMS) to conduct an Immediate Investigation Work Assignment (IIWA). An additional IIWA was tasked to LMS by NYSDEC in the spring of 1997. Based on the results of the IIWA investigations, NYSDEC initiated an RI in 1997 to characterize the nature and extent of groundwater contamination. In 1997, after repeated, unsuccessful attempts to have a responsible party fund the Site investigation and cleanup, NYSDEC contracted LMS to conduct a RI/FS. As an interim action during the RI, the abandoned septic tank, its contents, and 25 tons of surrounding contaminated soil were excavated and removed from the Site.

The RI and FS Reports were issued by NYSDEC in September 1998 and March 1999, respectively. The RI results indicated that VOC contamination, including tetrachloroethylene (PCE), trichloroethene (TCE), 1,1,1-trichloroethane (TCA), 1,1-dichloroethene (DCE), 1,1-dichloroethane (DCA), ethylbenzene, and xylenes, existed in soils at the MRIP Property; the dissolved-phase groundwater VOC plume was found to extend approximately 4,000 feet north-northeast from the MRIP Property; and downgradient private water supplies, as well as groundwater in the aquifer beneath the MRIP Property, exhibited VOC concentrations above EPA Removal Action Levels, federal and NYS MCLs, and NYSDEC Class GA Drinking Water Standards.

Additionally, 1,4-dioxane, a stabilizer associated with TCA, was detected at the MRIP Property at concentrations above the 10 NYCRR Part 5 standard of 50 ppb for "unspecified organic contaminants" (which includes 1,4-dioxane). Sampling of private wells indicated that 1,4-dioxane was present at concentrations ranging from 2 to 96 ppb. NYSDEC provided bottled water for two residences that exceeded the 50 ppb standard until the 1,4-dioxane concentrations fell below the 50 ppb standard.

On March 11, 1998, the EPA received a request from the NYSDEC to evaluate the Site for a removal action under CERCLA. EPA determined that a sufficient planning period existed before Site activities for the removal action had to be initiated, and accordingly, this response was conducted as a non-time critical removal action (NTCRA). The NTCRA involved construction of a groundwater extraction and treatment system (the near field system), which was designed to minimize the further migration of the most highly contaminated portion of the groundwater plume in the aquifer. EPA issued a Proposed Response Action document for this interim groundwater action on February 26, 1999. EPA authorized the system's construction with the finalization of the Action Memorandum for the NTCRA on June 4, 1999. As part of the NTCRA, throughout 1999, EPA conducted additional field work to characterize the Site. Additionally, while constructing a wastewater settling lagoon in December 1999 to support the groundwater treatment system, 532 tons of contaminated soil, paint waste and debris from an area identified as a Paint Waste Pit #1 (see Figure 2) were excavated and disposed of off-Site. Post-excavation samples met the soil cleanup levels for the Site established in the ROD. The groundwater extraction and treatment plant began operating 24 hours a day, seven days a week in May 2000. As of May 2008, over 52 million gallons of contaminated groundwater have been extracted and treated via this system.

NYSDEC released a feasibility study (FS) which evaluated cleanup alternatives for the entire Site in March 1999 and a proposed plan in November 1999. Public comments were accepted from November 15, 1999 through March 15, 2000. EPA assumed the role as lead agency with the issuance of the ROD in March 2000.

The major components of the selected remedy documented in the ROD are:
- construction of a new public water treatment plant and distribution system to serve the impacted area in High Falls;
- extraction of groundwater on and off the MRIP Property, with treatment via air stripping and GAC; and
- excavation of approximately 500 cubic yards (CY) of contaminated soils on the MRIP Property and disposal off-Site.

Additional removal and disposal of contaminated soils was performed based on data collected by NYSDEC during the RI and by EPA during the NTCRA, and as prescribed by the ROD. The four areas identified (see Figure 2) as areas potentially requiring remedial action were:
- Area of Concern (AOC) A, including Areas 1A, 1B and D2 as defined in the 2000 ROD: subsurface soils contaminated with PCE and benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds beneath the gravel parking area west of the commercial building and south of the near field groundwater treatment building.
- AOC B: a one- to two-foot-thick paint waste and debris layer buried two to three feet below ground surface (bgs), south of Paint Waste Pit #1 and north of the commercial building.
- AOC C: Paint Waste and Debris Pit #2 located immediately east of Paint Waste Pit #1. AOC C includes the soil stockpiled in this area during the December 1999 NTCRA excavation of Paint Waste Pit #1.
- AOC D, including Area 2B as defined in the 2000 ROD: remaining overburden soils contaminated with TCA in the vicinity of the former septic tank.

EPA excavated contaminated soil from AOC A and contaminated soil, paint waste and debris from AOCs B and C totaling 2,036 tons and disposed of the material off-Site. Prior to backfilling with clean fill, analytical results for post-excavation soil samples indicated that no cleanup levels were exceeded in soils remaining within the excavations.

Results indicated that soils within AOC D and within two subareas in AOC A (Areas 1B and D2) did not require remediation since contaminants were not present above cleanup levels. EPA further determined it would address levels of contaminants above the standards identified in the 2000 ROD in the shallow perched groundwater within AOC D as part of the groundwater remedy for the Site. Shallow groundwater contaminant concentrations within AOC D have been decreasing since the startup of the groundwater extraction and treatment system.

In February 2005, EPA initiated an investigation to determine if subsurface contamination originating from the MRIP Property may put nearby residents at risk due to vapor intrusion of VOCs into homes. Permanent sub-slab soil gas sampling ports were installed in 34 residential and 9 non-residential locations, with soil gas samples collected and analyzed for VOCs. The sampling determined that the concentrations of VOCs at all residential locations were below health-based screening levels. Therefore, no further evaluation and/or action was deemed necessary. However, samples obtained in the commercial building on the MRIP Property indicated the need to install a vapor mitigation system.

In November, 2005 a Remedial System Evaluation (RSE) was completed. Among its accepted recommendations for gaining Site closeout that were deemed critical to achievement of ROD goals in a reasonable timeframe, as well as for optimizing the near field groundwater extraction and treatment system was that additional characterization be performed and treatment or removal of residual source contaminants in the vadose zone soils be conducted. In a September, 2006 Action Memorandum, installation of a soil vapor extraction system and a mitigation system for the commercial building was authorized.

In early 2007, six new sub-slab ventilation systems were installed with extraction points in the subsurface layer underneath the building’s concrete floor. These mitigation systems are currently operating as designed. EPA documentation pertaining to these installations is listed within the Administrative Record (Appendix III).

In addition, in May 2006, contaminants of concern (COCs) were found in soil gas immediately north of the commercial building on the MRIP Property. An 18-well soil vapor extraction (SVE) system was installed in 2007. The SVE system has been fully operational since February 2008.

The construction of the water treatment plant and water distribution system called for in the ROD began in the fall of 2005 and was completed in the fall of 2007. The water treatment plant and accompanying water tower occupy approximately seven acres of land in the northern section of the MRIP Property (see Figure 2). The system is connected to the pressurized Catskill Aqueduct, which is part of the New York City reservoir system. Stringent sampling and monitoring is conducted to verify that the treated water meets all federal and NYS drinking water standards. The New York State Department of Health (NYSDOH) certified the newly constructed High Falls Water Treatment Plant as operational on September 24, 2007. Connection of homes and businesses within the water district to the public water supply was completed in November 2007. The MRIP building was also connected to the public water supply. Concurrently, POET systems were removed, associated well lines were capped, and well pumps’ piping and power were disconnected. An ordinance within the High Falls Water District prohibits residents from establishing or maintaining a source of drinking and domestic water separate from the public water supply, yet allows existing separate water sources to be used for purposes other than drinking and domestic use.

In 2006, an evaluation of the potential for use of monitored natural attenuation (MNA) for the far field plume, based on groundwater monitoring data collected on a semi-annual basis from 1999 through April 2006 was performed. In 2008, EPA conducted another MNA evaluation titled 2008 Final MNA Assessment. The reports containing these evaluations conclude that MNA is a viable remedy for the far field plume. Monitoring data indicate groundwater contaminant concentration trends are either decreasing or stable (see Figures 3 and 4), and exhibit the presence of the full range of TCA breakdown products within the far field plume and/or wells bounding the far field plume.

Since approximately January 2008, groundwater extraction and treatment rates of the near field treatment system have been increased to rates that could not be consistently maintained prior to the installation of the alternate water supply; previously, higher pumping rates caused negative impacts to private residential wells in the vicinity of the extraction wells. At that point in time, all impacted residents had been connected to the alternate water supply of the HFWD. This action has accelerated contaminant removal in the near field plume and also has enlarged the capture zone of the near field groundwater treatment system.

Enforcement Activity

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 following PRPs have been identified with regard to the MRIP Site: Varifab, Inc., R. C. Ballard Corporation, Daniel E. Gelles Associates, Inc., Mr. Daniel E. Gelles, and Kithkin Corp. With the exception of Kithkin Corp., which is a current owner, all of the identified PRPs are former owners and/or operators of 186 Mohonk Rd., the source of the release of hazardous substances from the Site.

Certain of the PRPs declined the opportunity to perform the RI/FS at the Site when requested by NYSDEC. EPA issued Notice of Liability letters to Kithkin Corporation, Mr. Daniel E. Gelles and Daniel E. Gelles Associates, Inc. Each of the three PRPs was offered the opportunity to perform a NTCRA at the Site. As reported in the ROD, the PRPs declined to undertake the removal action.

Since the ROD was issued, EPA has determined that the Kithkin Corp. is not a PRP with respect to disposal which occurred prior to Kitkin Corp.'s acquisition of the MRIP Property. EPA has also determined that there are no viable PRPs with respect to the Site.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

NYSDEC prepared a Citizen Participation Plan for the Site, dated June 1997. The Citizen Participation Plan included a community profile and contact list, and has also been used by EPA for its community outreach efforts at the Site. Site reports have been made available for public review at information repositories at the EPA Docket Room in Region 2, New York, the Stone Ridge Library, Stone Ridge, New York, and the Rosendale Public Library, Rosendale, New York. Additional highlights regarding historic public involvement activities related to the Site are provided in the ROD.

A Post-Decision Proposed Plan was prepared by EPA and finalized on July 2, 2008. A notice of the Post-Decision Proposed Plan and public comment period was placed in the Blue Stone Press on July 4, 2008 consistent with the requirements of NCP §300.430(f)(3)(1)(A), and a fact sheet summarizing the Post-Decision Proposed Plan was mailed to all persons on the Site mailing list.

The Post-Decision Proposed Plan was made available for review at the aforementioned information repositories for the Site and within EPA's Region 2 Superfund website. The public comment period extended from July 7, 2008 to August 6, 2008. EPA hosted a public meeting on July 17, 2008 to discuss the Post-Decision Proposed Plan. At this meeting, representatives from EPA and NYSDEC answered questions about conditions at the Site and the remedial alternatives. EPA's responses to comments received during the public meeting, along with responses to other written comments received during the public comment period, are included in the Responsiveness Summary (APPENDIX V).

SCOPE AND ROLE OF RESPONSE ACTION

Cleanup at the Site is currently being addressed as one operable unit (OU). This Record of Decision Amendment (ROD Amendment) describes the amended long-term remediation plan for Site groundwater (the groundwater response remedy), superseding the groundwater response remedy described within the ROD. The groundwater response remedy will address the near field and far field components of the VOC contaminant plume.

The remediation goal of the ROD is to eliminate human exposure to groundwater contaminated by the Site that does not meet state or federal drinking water standards, restore the groundwater contaminated at the Site to drinking water standards, prevent the contaminated groundwater from spreading and further impacting the aquifer, and eliminate the potential for human exposure to any contaminants in subsurface soils on the MRIP Property or the release of those contaminants into the groundwater.

Prior to the issuance of the ROD, several interim actions had occurred at the Site, including the installation of a groundwater extraction and treatment system to minimize the further migration in the bedrock aquifer of the most highly contaminated portion of the groundwater plume (conducted as a non-time critical removal action [NTCRA]). The groundwater response remedy described within the ROD also included a separate extraction and treatment system to address the portion of the plume which is downgradient from the source (the far field plume).

EPA has implemented the following elements of the ROD since its issuance:

- construction and operation of a new public water supply system, providing an alternate water supply to those with impacted or threatened private supply wells, and controlling risks to human health;
- removal and disposal of contaminated soils which are a source for groundwater contamination;
- active remediation of contaminated groundwater by the continued operation of the groundwater extraction and treatment system to address the near field plume at the source;
- long-term groundwater monitoring; and
- institutional controls preventing future use of the aquifer within the High Falls Water District (HFWD) via Ordinances of the Towns of Marbletown and Rosendale prohibiting establishment or maintenance of a source of drinking or domestic water separate from the public water supply of the HFWD

EPA has also performed extensive monitoring of the far field plume and conducted an investigation to evaluate potential vapor intrusion. The removal of potential sources, the continued operation and maintenance (O&M) of the existing groundwater extraction and treatment system, and the reduction of contamination within the near field plume have significantly reduced the migration of contaminants from the Site. As presented in the Post-Decision Proposed Plan (included as an attachment to the Responsiveness Summary in Appendix V), EPA’s evaluation of monitored natural attenuation (MNA) as a remedy for the far field plume as opposed to groundwater extraction and treatment (the remedy selected in the ROD for the far field plume) has resulted in the selection of MNA as a preferred alternative to groundwater extraction and treatment within the far field plume.

SUMMARY OF SITE CHARACTERISTICS

Since the issuance of the ROD, sampling performed to support characterization, remediation, and monitoring activities and subsequent hydrogeologic evaluations have provided data regarding contaminant distribution and subsurface conditions. Based upon the data collected to date, it is clear that groundwater at the Site continues to require remediation. The following sections summarize current Site conditions. For more detailed information regarding activities performed subsequent to the ROD and more complete examinations of analytical results, consult the documents listed within the Administrative Record in Appendix III.

Site characterization activities performed prior to the ROD are summarized in the Site History included herein. For detailed information regarding those activities and historic Site conditions, consult the ROD and the Administrative Record indexed therein. Documents listed in the Administrative Records are also available at the Site information repositories.

Physical Site Conditions

The MRIP Property consists of approximately 7.6 acres of land and a 43,000 square foot building in the southern corner of the property (Figure 2). Two former production wells located within the building have been disconnected. The area south of the building consists of a large lawn and a gravel driveway. The gravel drive wraps around the sides of the building, providing access to loading docks along the western end of the building. The lawn and driveway slope gently down to a culvert that passes beneath Mohonk Road allowing surface runoff to drain from the property. The near field groundwater treatment system currently exists in a small area immediately west of the MRIP Property commercial building.

The Site is located in an area of chiefly residential development. The MRIP Property is bounded on the southeast by Mohonk Road and to the northeast, northwest, and southwest by residential properties on large wooded lots. The property to the south is currently used to store machinery and trucks utilized for paving operations.

Groundwater is no longer the primary source of drinking water within the area, since the establishment of the High Falls Water District (HFWD) and the construction of the associated public water supply system. The nearest residential drinking water wells are located outside of the HFWD.

The nearest permanent watercourses to the Site are the Rondout Creek (Class B waters; Waters Index #139-14, Part 855.4) and Coxing Kill creek (Class C[T] waters, Waters Index #139-14-9, Part 855.4). Rondout Creek is not stocked with trout near the Site by either NYSDEC or the Ulster County Federation of Sportsmen. Rondout Creek is popular with recreational anglers, who fish for warmwater species such as smallmouth bass.

The HFWD drinking water treatment plant currently occupies 6.9 acres of the northern portion of the property acquired from the Kithkin Corp. The system is connected to the pressurized Catskill Aqueduct, which passes approximately 700 feet to the south of the MRIP Property, is owned by the City of New York, and maintained by the New York City Department of Environmental Protection (NYCDEP). This aqueduct supplies water to the New York City Reservoir System from the Ashokan Reservoir via an underground tunnel. The tunnel, as it passes through the Rondout Valley area in High Falls, is 14.5 feet in diameter, is about 500 feet below grade and is lined with concrete. A siphon house for the aqueduct (the Rondout Dewatering Chamber) is located approximately 1,200 feet west of the MRIP Property.

Geology and Hydrogeology

Three distinct water bearing zones have been identified at the Site, including an overburden (till) flow zone, a bedrock interface flow zone (at the shallow soil/bedrock interface), and a bedrock flow zone (the bedrock aquifer). The till, which dominates in the vicinity of the Site, is a highly compacted silt and fine-grained sand matrix and does not transmit water readily.

Regional groundwater flow is controlled by the structural geology of the area and is dominated by the orientation of the fractures within the bedrock aquifer. Groundwater flow is primarily to the north-northeast with localized variations to the west and east towards Rondout Creek and Coxing Kill Creek. Downhole geophysical investigations identified water-producing fractures with thin beds of finer-grained material throughout the vertical extent of the bedrock aquifer at depths ranging from approximately 20 to 194 feet bgs.

Vertical flow gradients on the MRIP Property are clearly downward. However, artesian or upward groundwater flow has been reported in several residential wells and monitoring wells outside of the MRIP Property.

The MRIP Property is situated near a topographical high that serves as a recharge area for the bedrock aquifer. The RI concluded that contamination entered the bedrock groundwater near the former septic tank and spread northward from the MRIP Property in the bedrock aquifer. In the vicinity of the near field groundwater extraction and treatment system, active pumping of groundwater from the bedrock is resulting in the capture of a significant portion of the groundwater contaminated with VOCs.

Summary of Groundwater Conditions

Site investigations have indicated that groundwater in the bedrock aquifer is contaminated with various VOCs, including TCA, TCE, DCE, and DCA, above Federal and NYS MCLs. A plume with a total VOC concentration of at least 5 ppb extends a distance of approximately 4000 feet from the MRIP Property and covers an area of roughly 170 acres. Since the discovery of the Site in 1994, residential wells beyond the perimeter of the plume have been monitored to verify that the water in these wells was suitable for domestic use.

From 1996 to 1998, NYSDEC installed 22 monitoring wells - including two in the overburden (MW-9 and -11), five in shallow soil/bedrock (MW-1 through -5), and thirteen in bedrock (MW-1B, -5B through -15B, and -11C), installed two bedrock extraction wells (MW-5R and -7R), and performed six rounds of groundwater sampling. The RI concluded that contamination entered the bedrock groundwater near the former septic tank and spread northward from the MRIP Property in the bedrock aquifer. The most concentrated portion of the VOC plume was detected in wells near the former septic tank. In November 1996, a groundwater sample from shallow soil/bedrock well MW-4 was found to contain 87,000 ppb of TCA, 10,000 ppb of DCE, 6,700 ppb DCA, and 3,300 ppb of TCE. Subsequent rounds of sampling confirmed levels of these VOCs above MCLs, and although levels decreased significantly after NYSDEC removed the tank in August 1997, the levels of VOCs remained elevated well above MCLs at the time of the ROD. Samples from the nearest downgradient bedrock monitoring well, MW-5B, also contained levels of TCA, DCA, DCE and TCE above MCLs, with the total VOC levels consistently greater than 1,000 ppb during the RI. At the time of the ROD, contaminant levels in MW-5B had not appreciably decreased.

As part of the NTCRA, EPA installed four additional bedrock wells on the MRIP Property (ERT-1 through ERT-4). Sampling results from these wells confirmed VOC concentrations were above MCLs on the MRIP Property, and ERT-4, the well closest to the location of the former septic tank, had the highest VOC total (an estimated total of 7,510 ppb TCA, DCA, DCE and TCE in October 1999).

Monitoring well data indicated that upon release into the overburden, contaminants migrated downward into the bedrock aquifer without significant lateral movement.

Monitoring wells located upgradient of the MRIP Property have not been found to contain TCA or other VOCs at concentrations above MCLs.

From 2004 through 2007, 1,4-dioxane was detected in well ERT-3 on the MRIP Property at concentrations ranging from 30 to 83 ppb. The highest concentration of 1,4-dioxane detected in the far field monitoring wells has been 18 ppb at MW-17-1, with non-detect or near non-detect (2 ppb) concentrations in the far down-gradient wells. With the present far field concentrations below the 10 NYCRR Part 5 Unspecified Organic Compound standard of 50 ppb (the NYSDEC cleanup level) and the relatively low near field concentrations, it is likely that natural attenuation physical processes which were identified in the 2008 Final MNA evaluation will continue to reduce 1,4-dioxane concentrations in the far field to below the NYS cleanup level.

Prior to the completion of the public water system, groundwater level measurements had typically been recorded from 15 residential and Site-related monitoring wells every two weeks in order to evaluate regional drawdown due to the groundwater extraction system and to ensure continued water supply to nearby residential wells, avoiding drawing water levels below the intake of the well pumps. Historically, the hydraulic gradient has been impacted by the operation of the groundwater extraction and treatment system and slow groundwater recharge in the area. The completed public water system has resulted in the termination of use of private wells in the area of groundwater contamination as potable supplies. Monitoring of water levels continued after the residential wells were disconnected in November 2007; an updated groundwater contour map is provided as Figure 4. A new monitoring well fitted with multiple ports to enable groundwater sample collection from different bedrock zones has been recently installed approximately 2,000 feet east-northeast of the MRIP Property to assist in evaluating conditions along the eastern edge of the plume.

Historically, the 25 monitoring wells associated with the Site have been sampled every six months in order to track the migration of the contaminant plume. Quarterly O&M reports for the near field system have included the results of all monitoring well and residential well sampling. Since the disconnection of the residential wells in November 2007, sampling and analyses were performed in December 2007 and April 2008; Table 1 provides the April 2008 analytical sample results. The extent and concentration levels of the bedrock groundwater contamination are depicted in Figure 4; Figure 5 presents total VOC concentration trends in several source (near field), mid-plume, and downgradient wells. The April 2008 VOC data indicate the limits of the plume are generally defined in all directions (Figure 4). Downgradient monitoring wells provide no suggestion of increasing trends in any of the contaminants. All wells in the far field plume with statistically significant trends show decreasing contaminant concentrations. The increased extraction rates of the near field treatment system and the additional source removal anticipated with the SVE system operation increase the likelihood that the plume margins will shrink in the future.

Groundwater quality monitoring of the Site has been an ongoing biannual effort at most of the 25 monitoring wells in the network since 1999. Sampling and analysis for MNA parameters began at most of the monitoring wells in April 2006 and has continued biannually. In order to obtain sufficient data to complete a full MNA evaluation of the current plume, the monitoring wells have been sampled on a quarterly basis since December 2007 for VOCs and 1,4-dioxane, along with standard field-monitored parameters. The most recent monitoring well sampling event was performed in April 2008; results are available in Table 1.

The 2008 Final MNA Assessment verified that the Site chemical and geochemical data show definitive evidence for biological activity supporting reductive dechlorination of TCA and TCE, including:

- o Decreasing contaminant concentrations in the near field plume;
- o Stable and low or non-detectible contaminant concentrations in the far field plume;
- o The full range of TCA breakdown products have been detected in the far field plume and/or the wells bounding it;
- o Presence of reducing conditions bounding the plume in the far field plume; and
- o Presence of reducing conditions in localized areas in both the near- and far field plumes.

Sampling for VOCs and 1,4-dioxane along with standard field-monitored parameters is continuing quarterly. Water level data continues to be collected and carefully monitored to ensure that analytical samples and natural attenuation data are sufficient to confirm that the near field plume is under hydraulic control.

Ecology and Cultural Resources
Four freshwater wetlands regulated by NYSDEC (under Article 24 of the NYS Environmental Conservation Law) are present within a 2-mile radius of the MRIP Property; however, none of the four are within 0.5 miles of the Site or are hydraulically connected to the Site. A Federally-regulated wetland is present along Mohonk Road, approximately 50 feet southwest of the MRIP Property. This wetland is designated as palustrine, scrub-shrub, broad-leafed deciduous, seasonally flooded/saturated on the U. S. Department of Interior Fish and Wildlife Service National Wetlands Inventory Map (Mohonk Lake quadrangle, draft). Other wetlands present in the area, associated with the flood plain of the Coxing Kill, are not associated with the proposed project area. Potential impacts and mitigation measures related to the construction of the near field system pipeline in this area were considered in the report entitled Ecological Evaluation of the Proposed Effluent Discharge Pipeline Routing from the Mohonk Road Industrial Plant Site, Interim Report 1, which is part of the Administrative Record.

A Step 1 Analysis of the Site conducted to identify wildlife resources concluded that no further study of fish and wildlife resources was necessary at that time. A description of the Step 1 Analysis is available in the RI (Chapter 8).

A Phase 1A Literature Review and Archeological Sensitivity Assessment conducted in March 1999 concluded that although numerous historic and prehistoric resources existed near the Site, it is likely that an archeological survey would not be necessary in the event that water lines are installed within three feet of existing pavement or in other areas previously disturbed.

A Phase IB Archeological Survey of the Water Treatment Plant location in November 2004 did not identify any archeological sites within the area of the proposed water treatment plant and associated assess road.

In September 2005, an archeological survey for service connections was conducted by EPA at 12 properties within the proposed Public Water Supply District. The survey concluded that due to the narrow width of the proposed trenches, it was likely that excavations would result in disturbance to relatively limited portions of the overall extent of sheet midden deposits that may be present, and that the installations of service connections in the front yards of residential and commercial properties are unlikely to adversely affect significant archeological deposits.

CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USERS

The MRIP Property is currently zoned for light industrial use. The Town of Marbletown maintains it has no intent of modifying the zoning for the MRIP Property. The MRIP Property is currently used for non-industrial, commercial purposes. The most reasonably anticipated future use for the MRIP Property remains commercial and light industrial.

The Site is located in an area of chiefly residential development. The bedrock aquifer has been designated as Class GA groundwater by NYSDEC, which is defined as follows:

> "The best use of Class GA waters is as a source of potable water supply. Class GA waters are fresh groundwaters found in the saturated zone of unconsolidated deposits and consolidated rock or bedrock."

Since the creation of the HFWD and the construction of the High Falls water treatment plant and distribution system, groundwater is no longer a source of potable water. Groundwater near the Site has been assumed to be used as a supply of potable water under future use scenarios developed for evaluation of potential risks.

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a Site in the absence of any actions or controls to mitigate such releases, under current and future land uses. The baseline risk assessment includes a human health risk assessment and an ecological risk assessment. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. A risk evaluation was performed in 2008 to evaluate future health risks associated with exposure to contamination at the Site based on current (2007) data that reflect changes in the Site condition based on components of the 2000 ROD that had been implemented. This section of the ROD summarizes the results of the risk evaluation for the Site.

Human Health Risk Assessment

A four-step process is utilized for assessing Site-related human health risks for a reasonable maximum exposure scenario: Hazard Identification – uses the analytical data collected to identify the contaminants of potential concern at the Site for each medium, with consideration of a number of factors explained below; Exposure Assessment - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed; Toxicity Assessment - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and Risk Characterization - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of Site-related risks The risk characterization also identifies contamination with concentrations which exceed acceptable levels, defined by the National Contingency Plan (NCP) as an excess lifetime cancer risk greater than 1 x 10-6 – 1 x 10-4 or a Hazard Index greater than 1.0; contaminants at these concentrations are considered chemicals of concern (COCs) and are typically those that will require remediation at the Site. Also included in this section is a discussion of the uncertainties associated with these risks.

Hazard Identification

In this step, the chemicals of potential concern (COPCs) in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence, and bioaccumulation. Analytical information that was collected to determine the nature and extent of contamination revealed the presence of VOCs, including DCE, DCA, TCA, and TCE in the groundwater at concentrations of potential concern. Based on this information, the risk evaluation focused on groundwater contaminants which may pose significant risk to human health.

As stated above, an updated risk evaluation was performed for this ROD Amendment. The updated risk evaluation was documented in a memorandum dated May 13, 2008 and can be found in the Administrative Record file. Table 3 lists the contaminants of concern that were evaluated in the updated risk evaluation.

Exposure Assessment

Consistent with Superfund policy and guidance, the updated risk evaluation assumed no remediation or institutional controls to mitigate or remove hazardous substance releases. Cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions at the Site. The RME is defined as the highest exposure that is reasonably expected to occur at a Site.

Groundwater at the Site is designated by the State as a potable water supply. Exposure pathways assessed in the updated risk evaluation for the groundwater included ingestion of tap water by adult and child residents. A summary of the exposure pathways that were associated with groundwater exposure can be found in Table 4. Typically, exposures are evaluated using a statistical estimate of the exposure point concentration, which is usually an upper-bound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. For the risk evaluation, only the well data from the 6 monitoring wells (MW-12B, MW-15B, MW-16, MW-17-1, MW-17-2, MW-17-3) located beyond the capture zone were used. Of the chemicals detected in these wells, DCE, DCA, TCA, and TCE were included in the risk evaluation; TCE was evaluated quantitatively, while the other three were assessed qualitatively. A summary of the exposure point concentration for TCE can be found in Table 3, while a comprehensive list of the concentrations for all COPCs can be found in the updated risk evaluation memorandum.

Toxicity Assessment

Under current EPA guidelines, the likelihood of carcinogenic risks and noncancer hazards due to exposure to Site chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of the Site-related chemicals would be additive. Thus, cancer and noncancer risks associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the human health risk assessment were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or another source that is identified as an appropriate reference for toxicity values consistent with EPA’s directive on toxicity values. This information is presented in Table 5 (cancer toxicity data summary). As no noncarcinogenic toxicity values are currently available from EPA recommended sources, the systemic health effects were not quantitatively assessed in the risk evaluation.

Risk Characterization

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

Risk = LADD x SF

Where: Risk = a unitless probability (1 x 10-6) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as [1/(mg/kg-day)]

These risks are probabilities that are usually expressed in scientific notation (such as 1 x 10-4). An excess lifetime cancer risk of 1 x 10-4 indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. Again, as stated in the National Contingency Plan, the acceptable risk range for Site-related exposure is 10-6 to 10-4, with the goal of protection (point of departure) being 1 x 10-6.

Results of the updated risk evaluation are presented in Table 6. The results indicate that residential exposure to the concentrations of TCE in the groundwater beyond the capture zone would be associated with an excess lifetime cancer risk of 3 x 10-5, which exceeds the point of departure of 1 x 10-6.

A qualitative review of the concentrations of DCE, DCA, TCA, and TCE was also performed. Of the 24 results collected from the 6 monitoring wells from the December 2007 sampling event, 88% (21 of 24) were in excess of their respective state MCLs for drinking water.

In summary, DCE, DCA, TCA, and TCE in groundwater contribute to unacceptable risks to receptor populations that may use the contaminated groundwater and are present at concentrations that exceed the state MCL.

The response action selected in this ROD Amendment is necessary to protect the public health or welfare of the environment from actual or threatened releases of contaminants into the environment.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals established to protect human health and the environment. RAOs are based on available information and regulatory standards, such as applicable or relevant and appropriate requirements (ARARs), NYSDEC's soil cleanup objectives, Site-specific risk-based levels, and the reasonably anticipated future land use for the MRIP Property, i.e., commercial development.

The prior RAOs developed in the 2000 ROD and during the FS for soil and groundwater were designed, in part, to mitigate the health threats posed by ingestion and inhalation (through showering) of groundwater and contact with soils. The following RAOs were established in the 2000 ROD:

- Eliminate inhalation and ingestion of, and dermal contact with, contaminated groundwater associated with the Site that does not meet State or Federal drinking water standards.
- Restore the aquifer to its most beneficial use (i.e., as a source of potable water), and restore it as a natural resource.
- Prevent or minimize cross-media impacts from COCs in contaminated soil to the underlying groundwater, which will also eliminate potential future exposure to this soil. Site soil cleanup objectives for COCs would be based on NYSDEC's TAGM 4046 for groundwater protection.
- Eliminate further off-MRIP Property contaminated groundwater migration.

Current Site conditions are reflective of the effectiveness of the removal and remedial actions taken to date. Based on these current site conditions, RAOs have been updated:

- Restore the aquifer to its most beneficial use (i.e., as a source of potable water), and restore it as a natural resource.
- Eliminate further off-MRIP Property contaminated groundwater migration.
- Eliminate inhalation and ingestion of, and dermal contact with, contaminated groundwater associated with the Site that does not meet State or Federal drinking water standards.

Groundwater standards identified for the Site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of NYS Sanitary Code, as well as the Federal Safe Drinking Water Act, 40 CFR Part 141-149, MCLs for drinking water. The contaminant-specific cleanup levels are presented in Table 1. The cleanup level for each of the Site’s COCs is 5 ppb.

DESCRIPTION OF GROUNDWATER RESPONSE ALTERNATIVES

The 1999 Proposed Plan and FS evaluated, in detail, the original remedial alternatives considered for the remedy selected in the 2000 ROD. The Post-Decision Proposed Plan highlighted the proposed changes to groundwater remedy, and summarizes the comparative evaluation of the original and proposed remedies. These alternatives are presented in detail below. The implementation time for each alternative reflects only the time required to construct or implement the remedy and not the time required to design the remedy, negotiate its performance by parties responsible for the contamination, if any, or procure contracts for design and construction.

CERCLA requires that each selected Site remedy be protective of human health and the environment, be cost effective, comply with applicable or relevant and appropriate requirements (ARARs), and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The alternatives for addressing groundwater contamination are provided below and are identified as GW-1, GW-2, and GW-3. Consistent with EPA guidance documents concerning ROD Amendments, the components of the original remedy proposed for amendment have been updated for cost and are compared to a new preferred alternative which was developed based upon existing Site circumstances. As noted above, EPA is currently operating a groundwater extraction and treatment system to control and reduce contamination within the near field plume. For all alternatives, the near field extraction and treatment system will continue to operate. Additionally, each alternative assumes that compliance with local regulations requiring property owners within the High Falls Water District to receive their domestic water supply from the High Falls Water Supply System will continue to be employed, preventing future use of the aquifer in the impacted or threatened area. The groundwater remedial alternatives are:

Alternative GW-1 No Further Action

Present Worth:	$ 4.7 million
Capital Cost:	$ 0
Annual O&M (30 year O&M period):	$ 375,360 near field system O&M
Time to Implement:	Not Applicable

EPA guidance addressing ROD amendments only requires that the original Selected Remedy (GW-2 below) and Proposed Remedy (GW-3 below) be described and compared in the ROD Amendment. This Alternative (GW-1) was included in the Proposed Plan, to provide the public with an understanding of the additional costs associated with the continued operation of the near-field plume treatment system; EPA wanted it to be clear that the continuation of this component of the remedy was not going to be subject to modification. It should be noted that if the continued operation of the near-field component of the Selected Remedy had been eliminated there would not be any future costs associated with remediating the groundwater and most importantly, the groundwater remedial action objectives would not be met

The Superfund program requires that the "No Further Action" alternative (GW-1) be considered as a baseline for comparison with the other alternatives. Under this alternative, EPA would take no further action within the far field plume to prevent migration of or exposure to groundwater contamination.

Alternative GW-1 includes active treatment of the near field plume, specifically, continued operation of the existing near field extraction and treatment system as a remedial action. The near field system includes extraction of contaminated groundwater from three recovery wells on the MRIP Property, treatment with an air stripper, carbon polishing, vapor phase carbon treatment of air releases, and discharge of the treated effluent to the Coxing Kill. Effluent criteria for discharge to the Coxing Kill, based on State regulatory standards under the State Pollutant Discharge Elimination System (SPDES) program, were provided by NYSDEC and documented in EPA’s June 4, 1999 Action Memorandum for the NTCRA (Appendix E of the ROD). Target cleanup levels in the near field plume would be based on Federal and NYS MCLs.

The current groundwater monitoring program would be discontinued under this alternative. As a result, EPA would be unable to determine if contaminants were migrating within groundwater or from groundwater to surface water or the extent to which natural attenuation was occurring. EPA would also be unable to assess source contaminant elimination beyond the evaluation of information inherent in operating the existing system.

The O&M cost for this alternative includes the continued O&M of the near field extraction and treatment system, including extraction of contaminated groundwater from recovery wells, treatment with an air stripper, carbon polishing of the effluent, vapor phase carbon treatment of air releases, and discharge of the treated effluent.

There are no capital costs for this alternative.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years.

GW-2 Groundwater Extraction and Treatment / Long-term Monitoring (LTM)

Present Worth:	$ 18.4 million
Capital Cost:	$ 5.44 million
Annual O&M (30 year O&M period):	$ 375,360 near field system O&M
	$ 375,360 far field system O&M
	$ 241,088/yr LTM years 1-5
	$ 222,240/yr LTM years 6-10
	$ 164,096/yr LTM years 11-30
	$ 400,000 SVE system years 1-3
Time to Implement:	12 months

Under Alternative GW-2, the far field component of the groundwater remedy established in the ROD would be implemented. Alternative GW-2 includes active remediation of contaminated groundwater by extraction and treatment Site-wide, i.e., continued operation of the existing near field system described under Alternative GW-1 and the installation and operation of a separate extraction and treatment system off the MRIP Property (the far field system), in addition to long-term monitoring of groundwater, as a remedial action. Under this alternative, the operation of the existing and new groundwater extraction and treatment systems would control groundwater at the MRIP Property and remediate groundwater in the vicinity of the MRIP Property and within the far field plume. A long-term groundwater monitoring and data evaluation program would be conducted to monitor the groundwater contaminant concentrations and reduction of VOC concentrations over time, to evaluate the effectiveness of the groundwater extraction and treatment systems, and to confirm that the remedy remains protective. Target cleanup levels in the near- and far field plumes would be based on Federal and NYS MCLs.

The far field system's design would be similar to the near field (existing) extraction and treatment system, including extraction of contaminated groundwater from recovery wells, treatment with an air stripper, carbon polishing of the effluent, vapor phase carbon treatment of air releases, and discharge of the treated effluent. The extraction wells would be designed to collect contaminated groundwater, intercept the contaminant plume, and prevent any potential migration downgradient. The potential for depression of groundwater elevation in the aquifer and effects on existing private wells noted in the ROD would not be as great a concern because the alternative water supply remedy (public water supply via the Catskill Aqueduct) has been implemented. For the purposes of conceptually identifying the number of wells, extraction rates, and well locations, the same assumptions made in the ROD (based on groundwater modeling performed during the FS) are assumed, specifically three wells pumping at a rate of 40 gallons per minute (gpm) each. Optimal design parameters and a more refined estimate of the time required to remediate the aquifer would be developed during the remedial design phase.

For cost estimating purposes, it was assumed that treated groundwater for the new groundwater treatment plant would be discharged to the Rondout Creek via a gravity discharge line. Effluent criteria would be based on New York State Surface Water Standards. The treatment process may produce precipitate in the air stripper, which would be thickened and disposed of periodically following pre-disposal characterization.

Long-term monitoring (LTM) would include periodic recording of groundwater elevations, recording of water quality parameters, and collection and analysis of groundwater samples to provide an indication of the movement of the contaminants and daughter products or of the progress of remedial activities. Quarterly monitoring would include wells representative of background conditions, horizontal and vertical plume boundaries, and the center of the plume, and include sentinel wells along the established perimeter. The annual monitoring event would include additional wells in the monitoring well network to refine contaminant distribution within the plume and to confirm conditions beyond the plume boundary. Table 1 presents the monitoring wells expected to be initially included in the LTM well network. Target cleanup levels in the near- and far field plumes would be based on Federal and NYS MCLs.

During the implementation of the remedy, the appropriateness of the monitoring well network with respect to the plume would be evaluated as the plume is further refined. If monitoring data indicate increases ongoing in levels of parent contaminants indicative of other sources or the contaminant plume increases significantly in areal or vertical extent and/or volume from that predicted by modeling estimates, modifications could be made to the well network. Potential modifications to the network would include the abandonment and/or installation of monitoring wells as necessary to support the selected remedy. Under this alternative, additional monitoring wells would be installed as necessary to allow for comprehensive monitoring of the contamination.

Operation and maintenance (O&M) of the Site’s soil vapor extraction system (SVE) would be continued as required. Monitoring of the SVE system would be performed to evaluate the effectiveness of the system. O&M of the system will continue until influent levels have become asymptotic over a 12-month period or; no measurable concentrations of Site contaminants are recoverable or; appropriate cleanup levels have been achieved. This evaluation would be conducted during the annual groundwater monitoring event, at a minimum. It is currently anticipated that the SVE system will be shutdown within the next 3 years. The sub-slab vapor mitigation system should remain in place and operational until it is no longer needed to address current or potential exposures related to soil vapor intrusion. This determination should be based on, but not limited to, whether the subsurface vapors are affecting indoor air quality at levels of concern when the active mitigation systems are turned off. This determination will be made upon an evaluation of appropriate monitoring results.

The O&M cost for this alternative includes the LTM program and operation of the two groundwater extraction and treatment systems as well as the O&M cost for the soil vapor extraction system (SVE) and the sub-slab vapor mitigation system. The treatment processes may produce precipitate, which would be thickened and disposed of off-Site periodically following pre-disposal characterization. For cost estimating purposes, it was assumed that the precipitate would be disposed of as non-hazardous waste at a local landfill.

Calculating the expected durations of the groundwater alternatives has proven to be difficult at this Site due to the fractured bedrock hydrogeology. The groundwater modeling conducted in the 1999 NYSDEC Feasibility Study (FS) was performed to estimate cleanup timeframes for the groundwater treatment remedy for the entire Site-wide groundwater plume (with both the near field and the far field treatment systems operating simultaneously). The modeling effort resulted in an estimated cleanup timeframe of 27 to 87 years for the source area (near field) groundwater as well as for the lower concentration far field groundwater. The concentrations in the far field have decreased since the time of the modeling performed in 1999 due to: 1) effective source area groundwater remediation and containment with the current near field treatment system and 2) natural attenuation of contaminants in the far field groundwater. Thus, the cleanup timeframe estimates for a groundwater pump and treat system for the far field plume would be even less than the estimates in the FS since the concentrations are now lower and contaminated groundwater in the near field is no longer *a* source for the far field. For cost estimating and alternative comparison purposes, a 30-year operation duration was utilized.

This remedy would result in achievement of an unlimited use and unrestricted exposure scenario. Achievement of this result would require longer than five years. In accordance with CERCLA, a remedy review would be conducted at least once every five years until such time that the Site allows for unlimited use and unrestricted exposure.

Alternative GW-3 MNA/Long-Term Monitoring

Present Worth	$ 8.28 million
Capital Cost	$ 12,720
Annual O&M (30-year O&M period)	$ 375,360 near field system
	$ 241,088 LTM years 1-5
	$ 222,240 LTM years 6-10
	$ 164,096 LTM years 11-30
	$ 400,000 SVE system years 1-3
Time to Implement:	0 months

Alternative GW-3 includes MNA and long-term monitoring of groundwater, in conjunction with the continued active treatment of the near field plume as described under GW-2, as a remedial action. Under this alternative, VOCs within the far field plume would be attenuated via naturally occurring processes within and along the perimeter of the far field plume. The continued operation of the existing groundwater extraction and treatment system would control and remediate groundwater in the vicinity of the MRIP Property. A long-term groundwater monitoring and data evaluation program would be implemented to monitor the groundwater contaminant concentrations and reduction of VOC concentrations over time and to confirm that the remedy remains protective. Target cleanup levels in the near and far field plumes would be based on Federal and NYS MCLs.

The 2008 Final MNA Assessment estimated that Site groundwater would achieve TCA remediation goals within the far field plume in approximately 44 years for Alternative GW-3. However, it should be noted that these projected time estimates should be considered rough estimates only. Monitoring data was evaluated in the 2008 Final MNA Assessment to produce an estimated aquifer restoration goal for each COC in the groundwater in the vicinity of each monitoring well (see Table 9). The restoration timeframes indicated that the cleanup levels for all of the COCs could be achieved at each of the monitoring wells in as few as 8 years or up to 56 years. In fact, some of these cleanup levels have already been achieved in several locations. The rate constants and the projected times derived from these values possess uncertainties. As noted above, there are also significant uncertainties in the modeling performed in the 1999 Feasibility Study that predicted it would take 27 to 87 years to achieve cleanup levels in the plume. As a result, the timeframes for achieving the cleanup levels throughout the plume under either the MNA approach of alternative GW-3 or the active groundwater extraction and treatment approach of alternative GW-2 cannot be distinguished. Overall, EPA believes that alternative GW-3 will provide similar levels of long term effectiveness as alternative GW-2.

The viability of MNA as a remedy is supported by the following observations:

- implementation of the alternate water supply remedy has eliminated inhalation, ingestion and dermal contact with contaminated groundwater associated with the Site that does not meet the State or Federal drinking water standards;
- decreasing contaminant concentrations in the near field plume, with achievement of clean-up goals within a reasonable timeframe;
- stable and low or non-detectible contaminant concentrations in the far field plume;
- presence of the full range of TCA daughter products in the far field plume and/or the wells bounding the far field plume;
- presence of reducing conditions bounding the far field plume;
- migration of contamination beyond the HFWD to private wells to the northeast that are not connected to the public water supply is unlikely given the reducing conditions bounding the plume and the non-detect concentrations in wells closer to the plume edges; and
- significant enhancement of the present MNA processes is expected by the additional source area removal presently being implemented via the SVE system and the increase in extraction rates at the near field groundwater treatment system.

Long-term monitoring (LTM) would include periodic recording of groundwater elevations, recording of water quality parameters, and collection and analysis of groundwater samples to provide an indication of the movement of the contaminants and daughter products or of the progress of remedial activities. Quarterly monitoring would include wells representative of background conditions, horizontal and vertical plume boundaries, and the center of the plume, and include sentinel wells along the established perimeter. The annual monitoring event would include additional wells in the monitoring well network to refine contaminant distribution within the plume and to confirm conditions beyond the plume boundary. Table 1 presents the monitoring wells expected to be initially included in the LTM well network.

During the implementation of the remedy, the appropriateness of the monitoring well network with respect to the plume will continually be evaluated as the plume is further refined. If monitoring indicates increases in levels of COCs within the contaminant plume or significant increases in areal or vertical extent and/or volume from that predicted by modeling estimates, modifications could be made to the well network. Potential modifications to the network would include the abandonment and/or installation of monitoring wells as necessary to support the selected remedy. Under this alternative, additional monitoring wells would be installed as necessary to allow for comprehensive monitoring of the contamination.

Operation and maintenance (O&M) of the Site’s soil vapor extraction system (SVE) would be continued as required. Monitoring of the SVE system would be performed to evaluate the effectiveness of the system. O&M of the system will continue until influent levels have become asymptotic over a 12-month period or; no measurable concentrations of Site contaminants are recoverable or; appropriate cleanup levels have been achieved. This evaluation would be conducted during the annual groundwater monitoring event, at a minimum. It is currently anticipated that the SVE system will be shutdown within the next 3 years. The sub-slab vapor mitigation system should remain in place and operational until it is no longer needed to address current or potential exposures related to soil vapor intrusion. This determination should be based on, but not limited to, whether the subsurface vapors are affecting indoor air quality at levels of concern when the active mitigation systems are turned off. This determination will be made upon an evaluation of appropriate monitoring results.

The O&M cost for this alternative includes the LTM program and operation of the near field groundwater extraction and treatment system as well as the O&M cost for the soil vapor extraction system (SVE) and the sub-slab vapor mitigation system. The treatment processes may produce waste sludge, which would be thickened and disposed of periodically following analyses to determine the appropriate disposal option; for cost estimating purposes, it was assumed that the sludge would be disposed of off-Site as non-hazardous waste at a local landfill.

This remedy would result in achievement of an unlimited use and unrestricted exposure scenario. Achievement of this result would require longer than five years. In accordance with CERCLA, a remedy review would be conducted at least every five years until such time that the Site allows for unlimited use and unrestricted exposure.

EVALUATION OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria. These nine criteria are as follows: overall protection of human health and the environment; compliance with applicable or relevant and appropriate requirements; long-term effectiveness and permanence; reduction of toxicity, mobility, and volume through treatment; short-term effectiveness; implementability; cost; and State and community acceptance. The evaluation criteria are described below.

- <u>Overall protection of human health and the environment</u> addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
- <u>Compliance with applicable or relevant and appropriate requirements (ARARs</u>) addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes and requirements, or provide grounds for invoking a waiver.
- <u>Long-term effectiveness and permanence</u> refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. This criteria also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/ or untreated wastes.
- <u>Reduction of toxicity, mobility, or volume through treatment</u> is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.
- <u>Short-term effectiveness</u> addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.
- <u>Implementability</u> is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- <u>Cost</u> includes estimated capital and operation and maintenance (O&M) costs, and net present worth costs.
- <u>State acceptance</u> indicates whether the State concurs with, opposes, or has no comment on the preferred remedy.
- <u>Community acceptance</u> will be assessed in the ROD Amendment and refers to the public's general response to the alternatives described in the Post-Decision Proposed Plan.

Comparative Analysis of Groundwater Response Alternatives
In this ROD Amendment, the analysis includes only groundwater response alternatives because the permanent remedies for the alternate water supply and Site soils have already been implemented.

Overall Protection of Human Health and the Environment
GW-1 would not be protective because the present and future use scenarios which assume that the Site groundwater could be utilized as a potable water supply present unacceptable carcinogenic risks. The Site groundwater is not currently being used as a source of drinking water within the Water District, but is used currently and will be in the future beyond the Water District boundary. Alternatives GW-2 and GW-3 would be protective of human health and the environment, as contaminant migration beyond the boundaries of the Water District would be restricted by natural attenuation or active treatment. GW-1 would not be protective of human health and the environment and/or achieve ARARs, since in the absence of the long-term groundwater monitoring program it would be unknown if Site contaminants would naturally attenuate or impact downgradient areas. Alternative GW-1 will therefore be eliminated from further discussion within the Comparative Analysis of Alternatives.

Compliance with ARARs
For groundwater COCs TCE, TCA, DCE, and DCA the NYS Class GA groundwater (groundwater whose best usage is a source of potable water) and NYS drinking water standard is 5 ppb; for 1,4-dioxane, the 10 NYCRR Part 5 standard for “unspecified organic contaminants” (which 1,4-dioxane is) is 50 ppb.

For GW-2 and GW-3, the ARARs set forth in the ROD would be achieved over time. Compliance with ARARs would be demonstrated through the long-term monitoring program.

Residual VOC concentrations in the treated discharge from the active groundwater response Alternatives GW-2 and GW-3 would be at or below Federal and State standards (Clean Water Act, 33 U.S.C. §§ 1251-1387, and NYS Surface Water Standards, 6 NYCRR Parts 700-705). The alternatives would also comply with the Resource Conservation and Recovery Act (RCRA) 42 U.S.C. §§ 6901–6992.

Air emissions for the treatment system identified in Alternatives GW-2 and GW-3 would comply with the Clean Air Act (CAA, 42 U.S.C. §§ 7401 et. seq.), 6 NYCRR Part 2129 (air emissions) and NYS Air Guide 1. The alternatives would also comply with the National Historic Preservation Act (NHPA), Executive Order 11988 - Flood Plain Management, Executive Order 11990 - Protection of Wetlands and 40 CFR 6 Appendix A (Policy on Implementing Executive Order 11990), EPA's 1985 Statement of Policy on Floodplains/Wetlands Assessments for CERCLA Actions, and New York State wetlands protection under 6 NYCRR Part 662.

Long-Term Effectiveness and Permanence
The groundwater alternative GW-2, which includes the continued operation of the near field groundwater system and construction and operation of a new far field groundwater system would likely clean up the groundwater plume somewhat faster than the GW-3 alternative which includes MNA with continued operation of only the near field groundwater system. However, Alternative GW-3 is expected to provide the same level of long-term effectiveness and permanence as Alternative GW-2 because there is no anticipated need for the contaminated ground water within the remedial timeframe and there is no distinguishable difference in the restoration timeframes. The effectiveness of Alternatives GW-2 and GW-3 would be assessed through routine groundwater monitoring and five-year reviews. O&M of the near field extraction and treatment system under Alternative GW-2 would provide an additional means to monitor removal of contaminants.

Reduction of Toxicity, Mobility, or Volume through Treatment
Alternative GW-3 includes active treatment in the near field plume only. As a result, GW-2 reduces the toxicity, mobility, and volume of contaminated groundwater through active treatment to a greater extent than GW-3. However, toxicity and volume are reduced in the far field plume under GW-3 by natural mechanisms.

Short-Term Effectiveness
Alternative GW-3 presents virtually no short-term impacts to human health and the environment since no construction is involved. The construction activities required to implement Alternative GW-2 would potentially result in greater short-term exposure to contaminants by workers who would come into contact with the treatment system; however, proper health and safety precautions would minimize this occurrence. Additional adverse impacts to the community would include disruption of traffic and excavation activities on public and private land. Potential impacts due to the construction activities include noise and fugitive dust emissions, however, these impacts would be minimized by employing appropriate construction techniques and practices. The technologies included under Alternative GW-2 and under Alternative GW-3 are proven and reliable.

Implementability
Groundwater response Alternatives GW-2 and GW-3 are available and can be implemented. The NTCRA component of both alternatives would already be in place on the MRIP Property, and would continue operating with a part-time operator. Alternative GW-3 does not involve any significant construction and, consequently, is much easier to implement. In addition to the continued O&M of the operational system, Alternative GW-3 only requires a monitoring program utilizing monitoring wells. Alternative GW-2 would be much more complex since it would also involve construction and piping installation in the short-term. For Alternative GW-2, the technologies for the installation of the extraction wells and treatment facility off the MRIP Property are readily available, although they would take approximately twelve months to construct. Access to property for construction of the additional treatment plant, and installation of piping and wells would need to be obtained. Acquisition of easements for private and/or public property would be required. Public concerns regarding the placement of the facilities would also need to be addressed.

Cost
The capital costs, O&M costs, and present worth costs associated with each of the groundwater response alternatives are presented below. Present worth costs were calculated over a 30-year period using 7 percent as the discount rate.

Cost Comparison Table

	GW-2	GW-3
Capital Cost	$ 5,441,000	$ 12,720
Annual Costs		
Systems O&M		
near field system	$ 375,360	$ 375,360
far field system	$ 375,360	$ 0
SVE system years 1-3	$ 400,000	$ 400,000
Long-term Monitoring		
years 0-5	$ 241,088	$ 241,088
years 6-10	$ 222,240	$ 222,240
years 11-30	$ 164,096	$ 164,096
Present Worth Cost	$ 18.4 million	$ 8.28 million

As indicated above, Alternative GW-2 is the most costly alternative. As presented above, the capital and present worth costs for Alternative GW-3 are much lower than

Alternative GW-2. The O&M of Alternative GW-2 is higher than Alternative GWS-3 due to the operation of the additional groundwater treatment system.

State Acceptance
NYSDEC concurs with the selected remedy. A letter of concurrence is attached (APPENDIX IV).

Community Acceptance
Community acceptance of the amended remedy for groundwater was assessed during the public comment period. While several residents expressed a preference for Alternative GW-2, EPA believes that the community generally supports the proposed remedy. Specific responses to public comments on the Post-Decision Proposed Plan are addressed in the Responsiveness Summary (APPENDIX V).

PRINCIPAL THREAT WASTES
Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. Contaminated groundwater generally is not considered to be source material; accordingly, there are no source materials defined as principal threat wastes at the Site.

SELECTED REMEDY
Based upon an evaluation of the various alternatives and consideration of community acceptance, EPA and NYSDEC have selected groundwater Alternative GW-3: MNA/Long-term Monitoring as the selected groundwater remedy for the MRIP Superfund Site.

Summary of the Rationale for the Selected Remedy
EPA believes that the preferred alternative will be protective of human health and the environment, will comply with ARARs, and will be cost-effective. Alternative GW-3 provides the best balance of trade-offs among alternatives with respect to the evaluating criteria.

The ultimate objective for the groundwater portion of this remedial action is to restore contaminated groundwater within the underlying aquifers to its beneficial uses. This aquifer could be used as a future source of drinking water, but is not being used currently for this purpose within the HFWD. Based on information obtained during the RI and subsequent remedial and investigative activities and a careful analysis of all remedial alternatives, EPA and NYSDEC believe that the Selected Remedy will achieve this objective in a reasonable time frame.
Since several lines of evidence (described under Alternative GW-3 herein and in detail within the 2008 Final MNA Assessment) indicate that monitored natural attenuation would be successful in attaining remediation objectives for Site groundwater, EPA and the State have determined that contingency measures are not needed as part of the remedy selected in this ROD.

Description of Selected Remedy
The elements of the amended groundwater response Alternative GW-3: MNA/Long-term Monitoring, include continued operation of the near field groundwater extraction wells and treatment system on the MRIP Property (installed under EPA’s NTCRA to address the most contaminated portion of the groundwater plume), monitored natural attenuation within the far field plume, long-term monitoring of groundwater, and institutional controls. Figure 2 shows the location of the existing near field treatment system, and Figure 4 shows the locations of the wells currently estimated to be included in the monitoring well network. Cleanup levels for each groundwater chemical of concern (COC) are specified in Table 1. The cleanup level for each of the Site COCs is 5 ppb.

The near field system includes extraction of contaminated groundwater from three recovery wells on the MRIP Property, treatment with an air stripper, and carbon polishing of the effluent, vapor phase carbon treatment of air releases, and discharge of the treated effluent to the Coxing Kill.

A long-term groundwater monitoring program will be implemented that will assess the effectiveness of groundwater extraction and treatment on the contaminant levels in the aquifer over time.

- Actual performance of the natural attenuation remedy within the far field plume will be carefully monitored in accordance with the LTM plan to be developed. If monitoring data indicate that contaminant levels do not continue to decline as estimated in the modeling predictions, EPA and NYSDEC will reevaluate the groundwater remedy decision.

Institutional controls are being relied upon to prevent the future use of the aquifer within the HFWD until the cleanup levels specified in Table 1 have been attained. These institutional controls consist of existing Ordinances of the Towns of Marbletown and Rosendale prohibiting establishment or maintenance of a source of drinking or domestic water separate from the public water supply of the HFWD. These institutional controls would no longer be necessary following the restoration of groundwater to beneficial use.

Operation and maintenance (O&M) of the Site’s soil vapor extraction system (SVE) would be continued as required. Monitoring of the SVE system would be performed to evaluate the effectiveness of the system. O&M of the system will continue until influent levels have become asymptotic over a 12-month period or; no measurable concentrations of Site contaminants are recoverable or; appropriate cleanup levels have been achieved. This evaluation would be conducted during the annual groundwater monitoring event, at a minimum. It is currently anticipated that the SVE system will be shutdown within the next 3 years. The sub-slab vapor mitigation system should remain in place and operational until it is no longer needed to address current or potential exposures related to soil vapor intrusion. This determination should be based on, but not limited to, whether the subsurface vapors are affecting indoor air quality at levels of concern when the active mitigation systems are turned off. This determination will be made upon an evaluation of appropriate monitoring results.

Summary of Estimated Remedy Costs

The estimated present worth cost to implement the groundwater remedy (GW-3) is $8.28 million (Table 7). The cost to implement the remedy, considered to include only the development of approved sampling and health and safety plans, is estimated to be $12,720. The estimated average annual cost for the MNA portion of this groundwater remedy (including near field system O&M at $375,600/year and long-term-monitoring averaging $186,644/year) for 30 years is $562,004. The estimated annual cost for the continued operation of the SVE system is $400,000.

The information in this cost estimate summary is based on the best available information regarding the anticipated scope of the selected remedy. These are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost of the project. Changes in the cost elements may occur as a result of new information and data. Major changes may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Difference (ESD), or a further ROD amendment.

Expected Outcomes of Selected Remedy
Based on historic groundwater data, the modeling performed by NYSDEC in the FS, and subsequent evaluations including the 2008 Final MNA Assessment, it is estimated that implementation of groundwater response Alternative GW-3 will achieve Site cleanup objectives for groundwater in several decades through operation of a groundwater extraction and treatment system for the near field portion of the plume and implementation of MNA program for the far field portion of the plume. By achieving cleanup levels, the groundwater will be available for its best use (as a source of potable water supply).

The cleanup levels for Site COCs, summarized in Table 1 herein (also shown in TABLE 14 of the 2000 ROD), are based on ARARs (i.e., EPA and NYS groundwater and drinking water standards). The cleanup level for each of 1,1-DCE, 1,1-DCA, 1,1,1-TCA, and TCE is 5 ppb, while the cleanup level for 1,4-dioxane is 50 ppb. The near field system component is already operational; the amended remedy requires only limited project plans to be considered operational.

STATUTORY DETERMINATIONS
Under its legal authorities, EPA's primary responsibility at Superfund Sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when complete the selected remedial action for this Site must comply with applicable, or relevant and appropriate environmental standards established under Federal and State environmental laws unless a waiver from such standards is justified. The selected remedy also must be cost-effective and utilize permanent solutions and alternative treatment technologies or resource-recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous substances, as available. The following sections discuss how the selected remedy meets these statutory requirements. EPA and NYSDEC believe that the selected remedy will be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions to the maximum extent practicable, as discussed below.

Protection of Human Health and the Environment
The selected remedy is protective of human health and the environment. Alternative GW-3 will minimize the migration of the groundwater plume and achieve cleanup levels for the best available use of the aquifer as a potable water supply. The long-term monitoring of the groundwater will provide a means by which the attenuation of contamination within the far field plume can be confirmed. Implementation of the selected remedy will not pose unacceptable short-term risks, and no adverse cross-media impacts are expected.

Compliance with ARARs
The NCP (§ 300.430(f)(5)(ii)(B) and (C)) requires that the selected remedy attain Federal and State ARARs. The remedy will comply with the following action-, chemical-and location-specific ARARs identified for the Site which will be demonstrated through monitoring, as appropriate.

Action-Specific ARARs:
- 40 CFR Part 61 - National Emissions Standards for Hazardous Air Pollutants
- 42 U.S.C. §§ 7401-7601, Clean Air Act
- 42 U.S.C. Section 6901-6992, 40 CFR Parts 260-268 - RCRA Standards for Handling, Transportation and Disposal of Hazardous Waste, including Land Disposal Restrictions
- CERCLA off-Site policy (NCP §300.440)
- 6 NYCRR Part 200.6 - Ambient Air Quality Standards

- o 6 NYCRR Parts 370-376 - New York State Standards for Handling, Transportation and Disposal of Hazardous Waste

DOT transportation regulations

- o Small System Compliance Technology List for the Surface Water Treatment Rule (EPA 815-R-97-002)
- o Small System Compliance Technology List for the Surface Water Treatment Rule and Total Coliform Rule (EPA 815-R-98-001)
- o Small System Compliance Technology List for the Non-Microbial Contaminants Regulated Before 1996 (EPA 815-R-98-0021, and Variance Technology Findings for Contaminants Regulated Before 1996 (EPA 815-R-98-003)

Chemical-Specific ARARs:

- o 40 CFR Part l41 - Federal Safe Drinking Water Act Maximum Contaminant Levels (MCLs)
- o 42 U.S.C. §§ 300f-300j-26, Safe Drinking Water Act
- o 6 NYCRR Parts 700-705, NYS Surface Water Standards
- o 6 NYCRR Part 703, Groundwater Standards for Class GA groundwater
- o 33 U.S.C. §§ 1251-1387, Clean Water Act
- o 10 NYCRR Part 5 - New York State Sanitary Code for Drinking Water

Location-Specific ARARs:

- o 40 CFR 6 Appendix A (Policy on Implementing Executive Order 11990)
- o 6 NYCRR Part 662, New York State wetland protection provisions

To-Be-Considered

- o Executive Order 11990 - Protection of Wetlands
- o EPA 1985 Statement of Policy on Floodplains/ Wetlands Assessments for CERCLA Actions
- o National Historic Preservation Act (NHPA), 16 U.S.C. 470-1 – 470a-2
- o Executive Order 11988 - Flood Plain Management
- o Air Guide I – NYSDEC Control of Toxic Ambient Air Contaminants
- o *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites* (EPA 540-F-99-009, April 1999)

Cost-Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (NCP §§ 300.430(f)(1)(i)(B)). Overall effectiveness is based on the evaluations of: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Based on the comparison of overall effectiveness to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost-effective (NCP §§ 300.430(f)(1)(ii)(D)). Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital costs and O&M costs have been estimated and used to develop present-worth costs. In the present-worth cost analysis, annual costs were calculated for 30 years (estimated life of an alternative) using a seven percent discount rate (consistent with the Proposed Plan). For a detailed breakdown of costs associated with the selected remedy, please see Table 8.

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

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized. The selected remedy utilizes permanent solutions to address the groundwater contamination problem at the Site. The selected remedy represents the most appropriate solution at the Site because it provides the best balance of trade-offs among the alternatives with respect to the evaluation criteria.

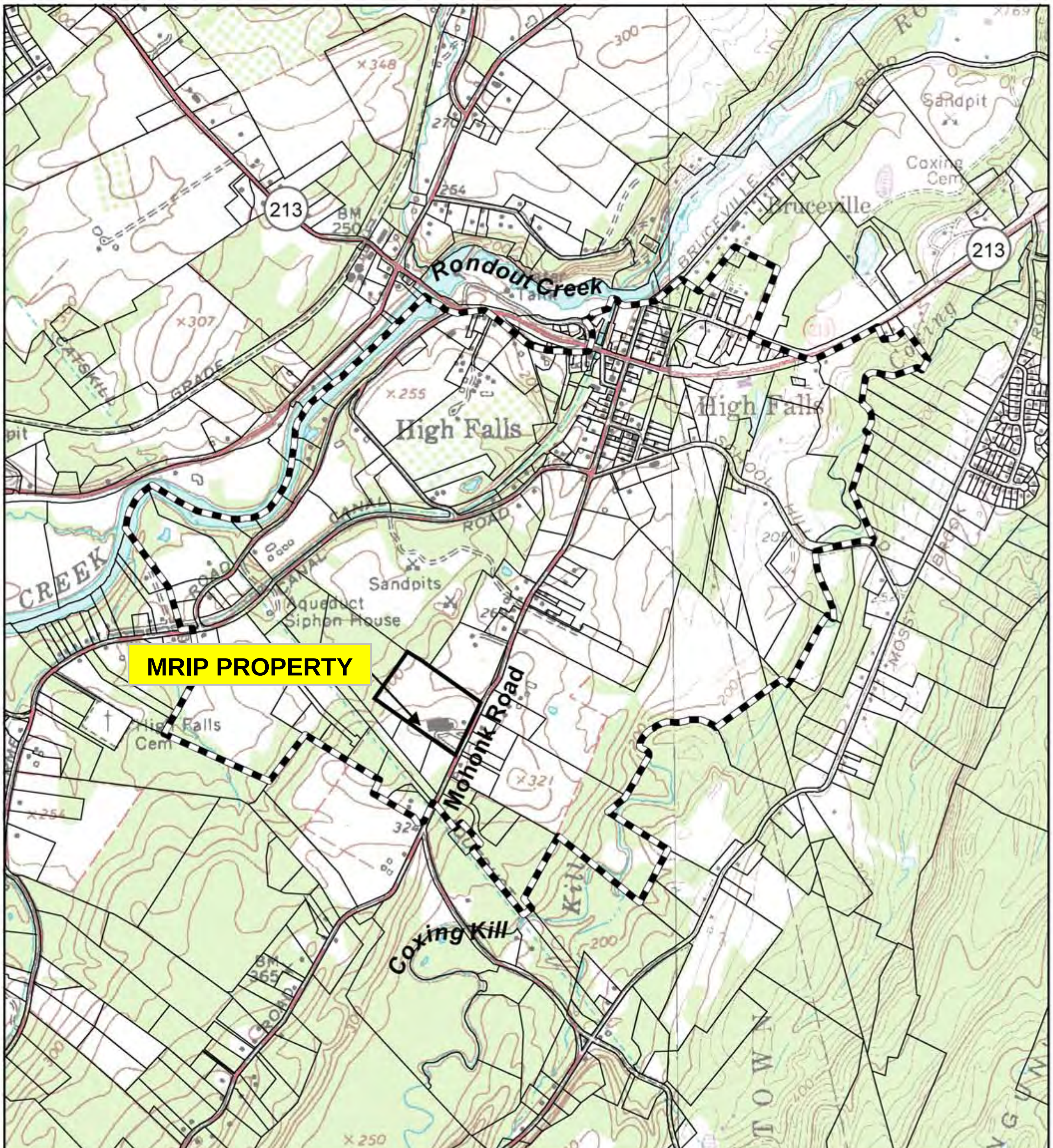
Preference for Treatment as a Principal Element
The statutory preference for remedies that employ treatment as a principal element is satisfied through the use of treatment measures to reduce the volume and mobility of contaminated groundwater in the aquifer.

Five-Year Review Requirements
Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, but will take more than five years to attain remedial action objectives and cleanup levels in the groundwater, a policy review may be conducted no less often than each five years after completion of the construction of the remedial action components for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES
There were no significant changes from the preferred remedy presented in the Post-Decision Proposed Plan.

APPENDIX I.

FIGURES



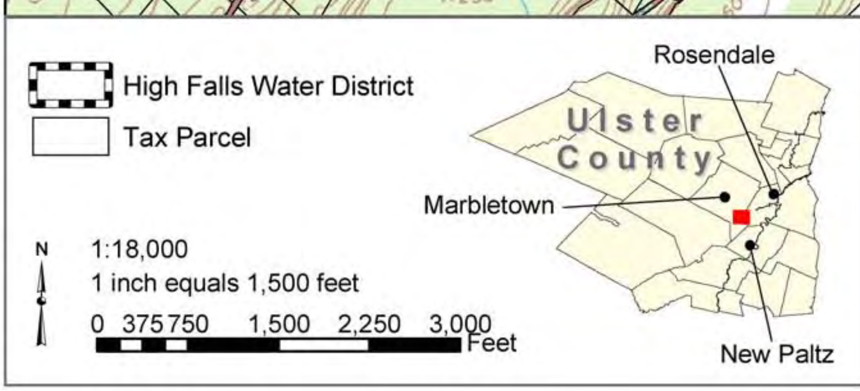


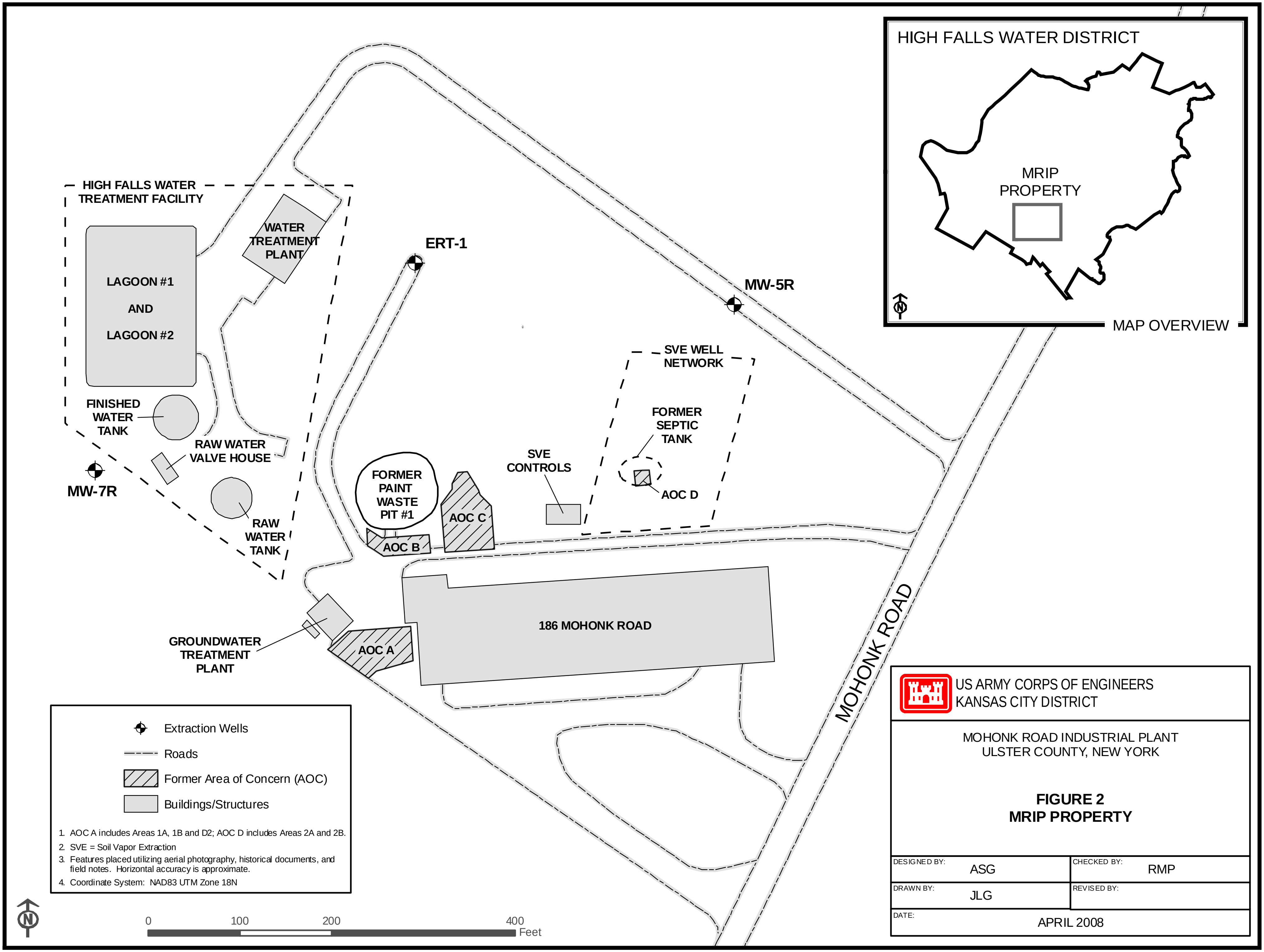
Figure 1

Site Location Map

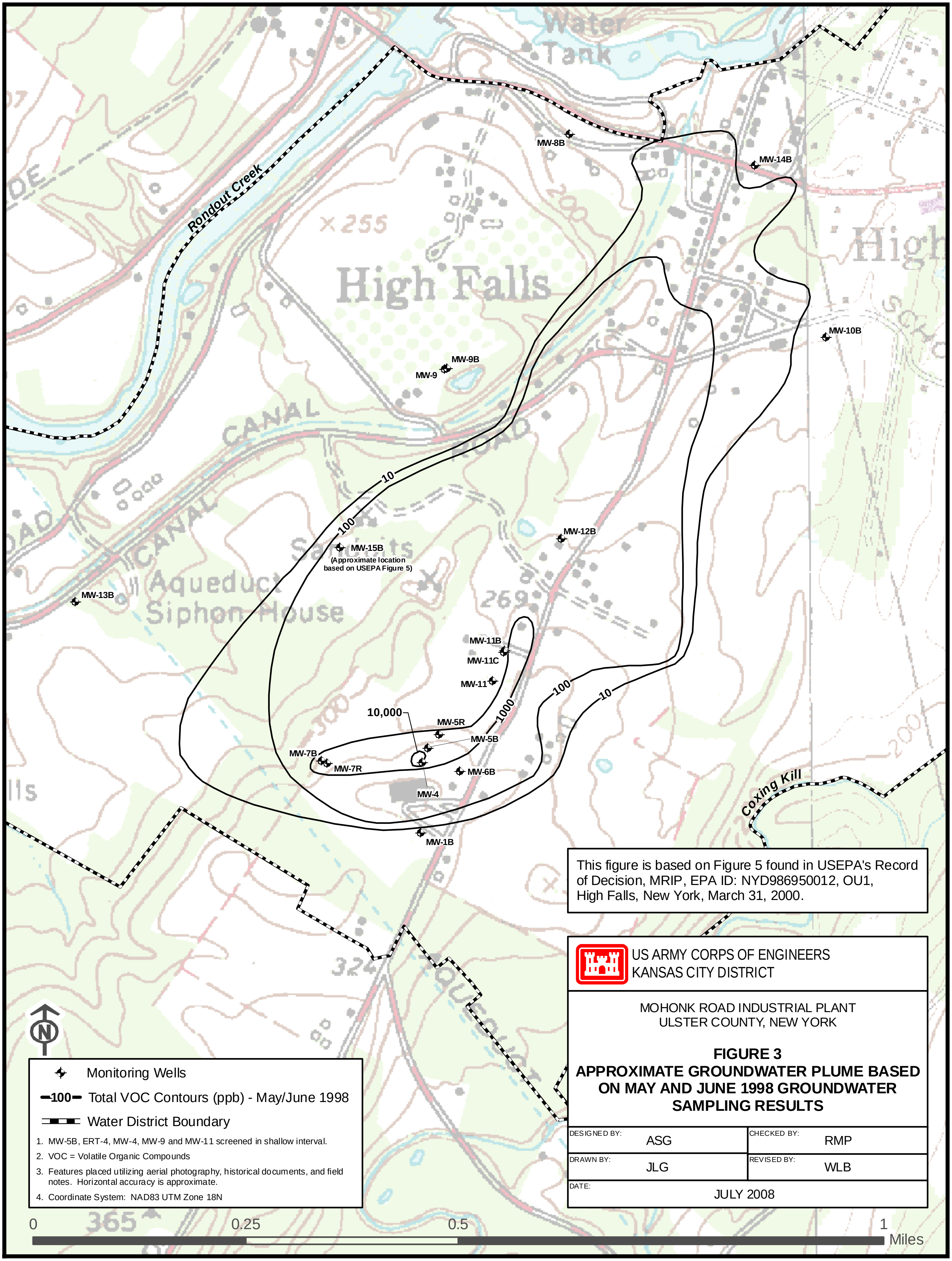
Mohonk Road Industrial Plant

(MRIP)

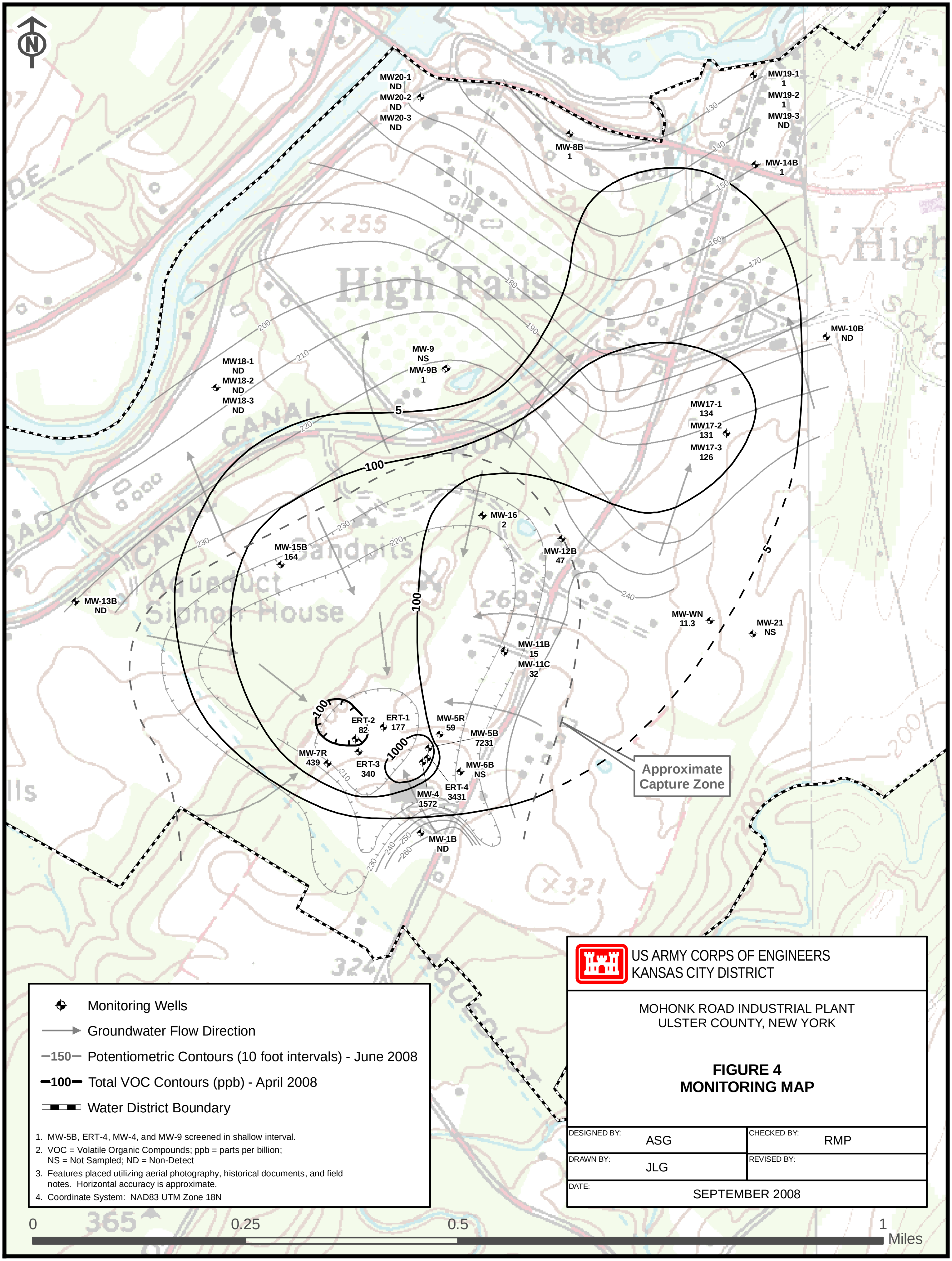
High Falls, New York



K:\MissionProjects\htw\mrip\GIS\arcgismaps\ProposedPlan_2008\FIG2_Treatment8x11BW_28APR08.mxd

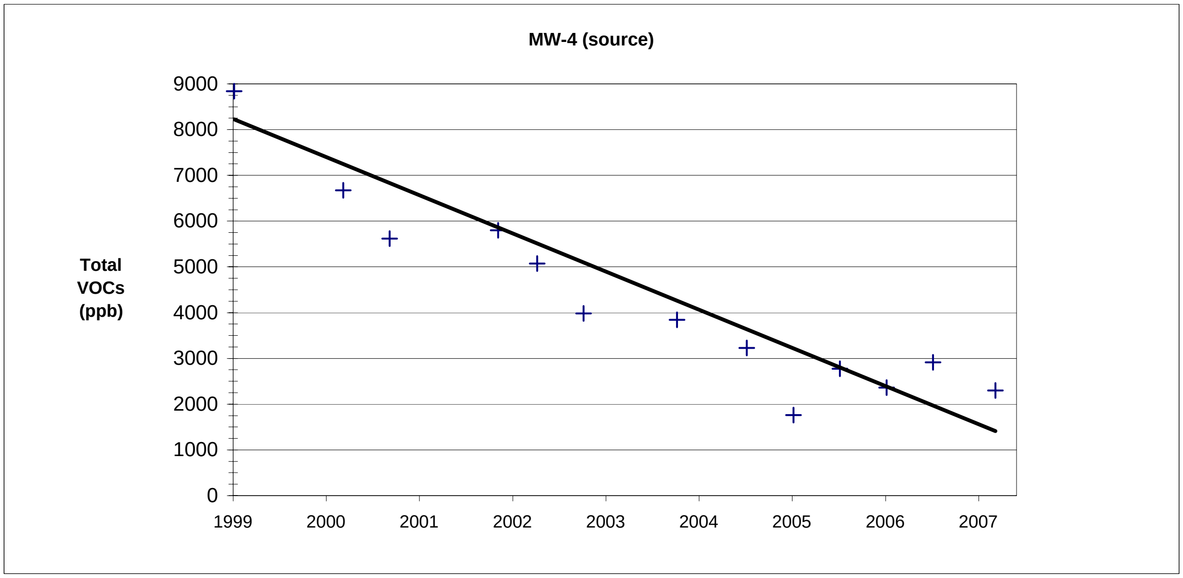


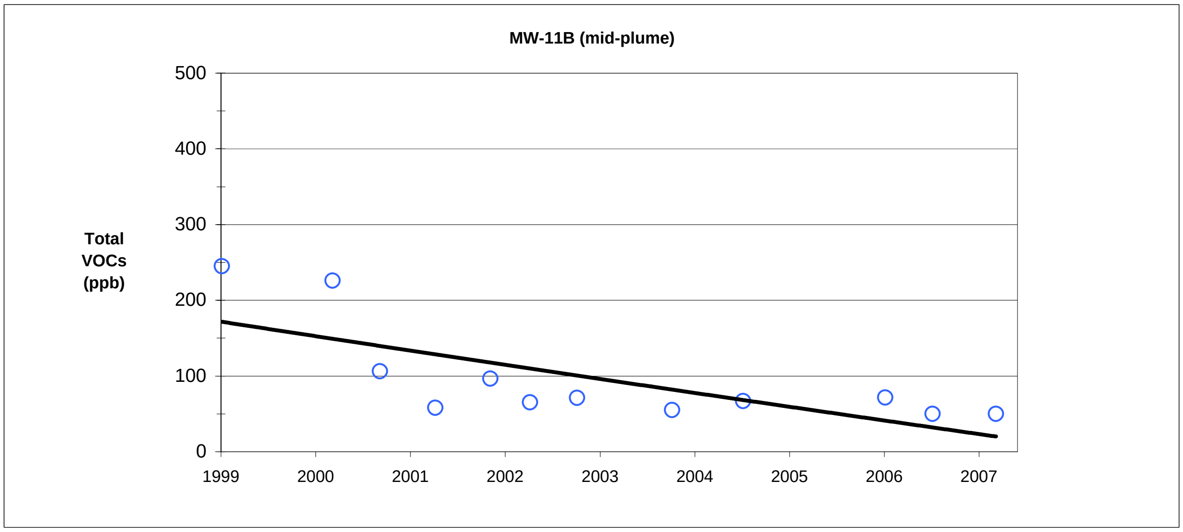
K:\MissionProjects\htw\mrip\GIS\arcgismaps\AmendedROD_2008\AmendedROD_2008.mxd

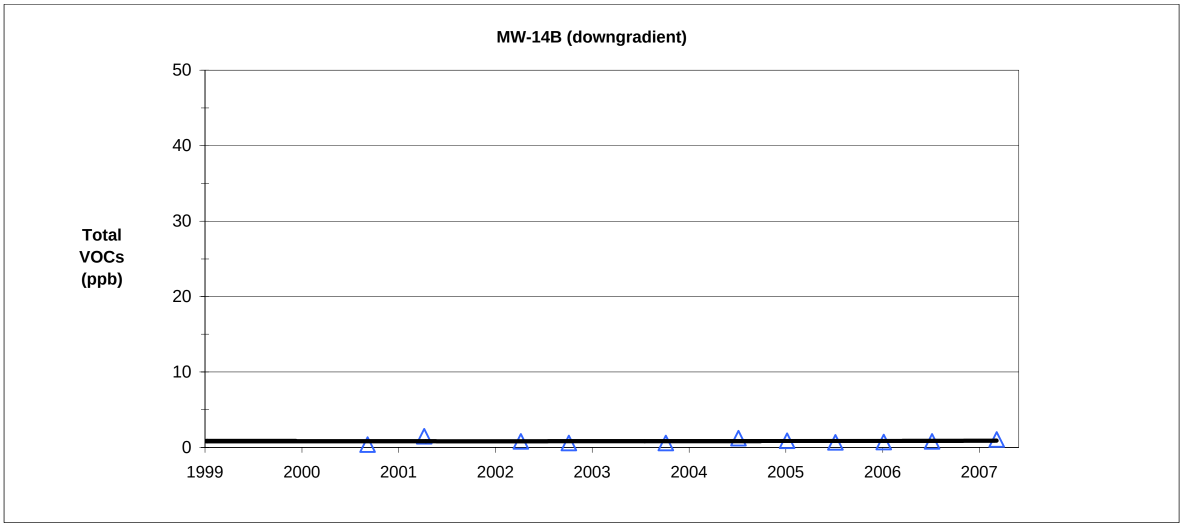


K:\MissionProjects\htw\mrip\GIS\arcgismaps\AmendedROD_2008\AmendedROD_2008Fig4_17SEP08.mxd | g5ecxjlg | 9/17/2008 | 10:02:03 AM

Figure 5
Total VOC Concentration Trends
Mohonk Road Industrial Plant Site







APPENDIX II.

TABLES

Table 1
Proposed Long-term Monitoring Well Network
Mohonk Road Industrial Plant
High Falls, New York

Monitoring Well	Analytical Results for COCs[1]					Projected Long term Monitoring Frequency[2]		
	1,1-DCE (µg/L)	1,1-DCA (µg/L)	1,1,1-TCA (µg/L)	TCE (µg/L)	1,4-Dioxane (µg/L)	yrs 0 - 5	yrs 6 - 10	yrs 11 - 30
MCLs	5	5	5	5	50			
Perimeter Wells / Non-Detects								
MW-8B	0.26J	0.29J	0.5U	0.5U	3.6	Qtr	NS	NS
MW-9	NS	NS	NS	NS	NS	C[4]	C[4]	C[4]
MW-9B	0.5U	0.22J	0.42J	0.5U	2	Qtr	Qtr	Ann
MW-10B	0.5U	0.5U	0.5U	0.5U	2U	Qtr	Qtr	Ann
MW-13B[3]	0.5U	0.5U	0.5U	0.5U	2U	Qtr	Ann	Ann
MW-14B	0.24J	0.74	0.5U	0.5U	1.6J	Qtr	Qtr	Ann
MW-18-1	0.5U	0.38J	0.5U	0.5U	0.73J	Qtr	Qtr	Ann
MW-18-2	0.5U	0.5U	0.5U	0.5U	0.98J	Qtr	Qtr	Ann
MW-18-3	0.5U	0.35J	0.5U	0.5U	0.66J	Qtr	Qtr	Ann
MW-19-1	0.5U	0.5J	0.5UJ	0.5U	1.9J	Ann	Ann	Ann
MW-19-2	0.5U	0.57	0.5UJ	0.5U	1.5J	Ann	Ann	Ann
MW-19-3	0.5U	0.41J	0.5UJ	0.5U	1.6J	Ann	Ann	Ann
MW-20-1	0.5U	0.5U	0.5U	0.5U	2U	Ann	NS	NS
MW-20-2	0.5U	0.5U	0.5U	0.5U	2U	Ann	NS	NS
MW-20-3	0.5U	0.5U	0.5U	0.5U	2U	A	NS	NS
MW-21-1[6]	NS	NS	NS	NS	NS	Qtr	Qtr	Ann
MW-21-2[6]	NS	NS	NS	NS	NS	Qtr	Qtr	Ann
MW-21-3[6]	NS	NS	NS	NS	NS	Qtr	Qtr	Ann
MW-21-4[6]	NS	NS	NS	NS	NS	Qtr	Qtr	Ann
MW-21-5[6]	NS	NS	NS	NS	NS	Qtr	Qtr	Ann
MW-21-6[6]	NS	NS	NS	NS	NS	Qtr	Qtr	Ann
Plume Wells								
ERT-2	14J	4.2	60	3.3	2U	Ann	Ann	Ann
ERT-3	37	13	250	40	31	Ann	Ann	Ann
MW-11	NS	NS	NS	NS	NS	C[4]	C[4]	C[4]
MW-11B	11J	5.3	13	2.4	5.3	Qtr	Ann	Ann
MW-11C	4.4	1.3	6	1.1	1.9J	Qtr	Ann	Ann
MW-12B	15J	8.8	18	5.2	9.8	Qtr	Qtr	Qtr
MW-15B	35	17	110	2.2	8.2	Qtr	Qtr	Qtr
MW-16	0.54	0.5U	1.1	0.5U	2U	Qtr	Qtr	Qtr
MW-17-1	38	14	74	7.5	11	Qtr	Qtr	Qtr
MW-17-2	36J	16	73	5.5	14	Qtr	Qtr	Qtr
MW-17-3	36J	18J	71	0.6	13	Qtr	Qtr	Qtr
MW-6B	NS	NS	NS	NS	NS	Qtr	Qtr	Qtr
MW-7B	NS	NS	NS	NS	NS	C[6]	C[6]	C[6]
Former Septic Tank Area Wells								
ERT-4	250	85J	3000	96J	9.3	Qtr	Qtr	Qtr
MW-4	110	32J	770	660	9.6	Ann	Ann	Ann
MW-5B	770	21J	6300	140J	14	Ann	Ann	Ann
Extraction Wells								
ERT-1	37J	10	120	10	7.8	Qtr	Qtr	Qtr
MW-5R	14J	3.4	36	6	14	Qtr	Qtr	Qtr
MW-7R	82	25	330	1.5	3.7	Qtr	Qtr	Qtr
Background Wells								
MW-1B	0.5U	0.5U	0.5U	0.5U	2U	Qtr	Qtr	Qtr

Notes:
1. Environmental samples collected April 2008.
2. Frequency of collection of environmental samples and water quality parameters may be altered in response to significant changes in data throughout the course of the program.
3. Artesian well.
4. Sampling not currently projected at this existing network well.
5. MW-1, -2, -3, -5, and -6, formerly part of the historic monitoring network, have since been replaced, removed, abandoned, or destroyed.
6. MW-21 will be first sampled in October 2008.

Abbreviations:

1,1-DCA	1,1-dichloroethane	J	estimated value	Semi	semi-annually (2 times/year)
1,1-DCE	1,1-dichloroethene	MCL	Maximum Contaminant Levels	TCE	trichloroethene
1,1,1-TCA	1,1,1-trichloroethane	NA	not available	U	not detected above the reported value
Ann	annually (1 time/year)	NR	not recorded	µg/L	micrograms per liter
C	contingent sampling only	NS	not sampled	yrs	years
COCs	Contaminants of Concern	Qtr	quarterly (4 times/year)		
ft amsl	feet above mean sea level				

Table 2
Historical Summary of Groundwater Analytical Results
Mohonk Road Industrial Plant
High Falls, New York

Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
MRMW-1B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	<0.1U	<0.1U	<0.1U	NA
	January 2002	<0.4U	<0.4U	<0.3U	<0.3U	NA
	August 2002	<1.0J	<1.0J	<1.0J	<1.0J	NA
	January 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	1.3J
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2005	0.5U	0.5U	0.5U	0.5U	2U
	April 2006	0.5U	0.5U	0.5U	0.5U	2R
	October 2006	0.5U	0.5U	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.5U	0.5U	0.5U	0.5U	2U
MRMW-4	October 1999	380J	62	6800J	1600	NA
	December 2000	500	75J	4500	1600	NA
	June 2001	516	49.5	3580	1470	NA
	January 2002	891	64	6160	2490	NA
	August 2002	650	49	3300	1800	NA
	January 2003	428	32	2960	1650	NA
	July 2003	306	34	2220	1420	NA
	July 2004	310	33J	2200	1300	9.6
	April 2005	290	41	1600	1300	13
	October 2005	100	39J	820	800	16J
	April 2006	240	31J	1500J	1000J	5.9
	October 2006	120	43	1100	1100	4
	April 2007	210	34	1700	970	NA
	December 2007	160	47J	1100	990	3.3
MRMW-5B	October 1999	250	50	2900	130	NA
	December 2000	280	43	2100	120	NA
	June 2001	327	47.0	2370	91.0	NA
	January 2002	1360	92.0	10,100	436.0	NA
	January 2003	445	19	3030	171	NA
	July 2003	171	27	1460	62	NA
	July 2004	NS	NS	NS	NS	NS
	April 2005	440	35	3000	270	15
	October 2005	97	41J	1100	96	27
	April 2006	280	28J	2500	230J	12J
	October 2006	110	8.7	880	87	3.1
	April 2007	420	27	2600	120	NA
	December 2007	560	15	4600	380	4
MRMW-5R	October 1999*	28	7J	290J	16	NA
	December 1999	270	22	1500	62	NA
	December 2000	120	23	400	34	NA
	June 2001	75.0	17.4	466	24.5	NA
	January 2002	339.0	67	1570	67	NA
	August 2002	110	22	440	27	NA
	January 2003	84	19	374	22	NA
	July 2003	30	5	116	8	NA
	July 2004	61	19	290	10	NA
	March 2005	67	14	280	20	7.1
	October 2006	61	15	230	9.2	5
	April 2007	47	33	130	7	NA
	December 2007	36	55	350	2.1	2.1U

Table 2
Historical Summary of Groundwater Analytical Results
Mohonk Road Industrial Plant
High Falls, New York

Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
MRMW-6B	October 1999	7J	2J	58	10U	NA
	December 2000	3	<3U	28	<3U	NA
	June 2001	5.7	0.5	30.4	0.2J	NA
	January 2002	13	1	78	0.7J	NA
	August 2002	5.6	0.50J	27	<1J	NA
	January 2003	2	0.4J	14	<0.3U	NA
	July 2003	2	<0.3U	13	<0.3U	NA
	July 2004	3.7	0.42J	18	0.5U	1.6J
	April 2005	1.7	0.59	9.2	0.5U	2.3
	April 2006	2.6	0.5U	14	0.5U	20U
	October 2006	1.5	0.28J	11	0.5U	20R
	April 2007	3.8	0.5U	17	0.5U	NA
	December 2007	1.5	0.33J	11	0.5U	2.1U
MRMW-7R	October 1999*	35	23	470	4J	NA
	December 1999	71	27J	1000	8.9	NA
	December 2000	44	27	320	<3U	NA
	June 2001	39.8	23.2	381	3.8	NA
	January 2002	34	39	550	4	NA
	August 2002	56	60	480	5.0J	NA
	January 2003	23/24	15/15	242/244	3/3	NA
	July 2003	43	24	365	4	NA
	July 2004	25	21	220	3.1	NA
	March 2005	43	22	270	5.6	8
	November 2005	20	16	170	3.5J	11
	May 2006	24	23	200	4.8	NA
	October 2006	33	46	250	1.6	3.9
	April 2007	43	53	250	1.9	NA
	December 2007	37	52	350	2	2
MRMW-8B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	<0.1U	<0.1U	<0.1U	NA
	January 2002	<0.4U	<0.4U	<0.3U	<0.3U	NA
	January 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	0.89J
	April 2005	0.11J	0.24J	0.5U	0.5U	1.6J
	October 2005	0.5U	0.5U	0.5U	0.5U	0.99J
	April 2006	0.5U	0.5U	0.5U	0.5U	20R/2R
	October 2006	0.5U	0.22J	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.22J	0.37J	0.5U	0.5U	2U
MRMW-9	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	<0.1U	<0.1U	<0.1U	NA
	January 2002	<0.4U	<0.4U	0.7J	<0.3U	NA
	August 2002	<0.5	0.27 J	0.73	<0.5	NA
	January 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA

Table 2
Historical Summary of Groundwater Analytical Results
Mohonk Road Industrial Plant
High Falls, New York

Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
MRMW-9B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	0.2J	<0.1U	0.6	<0.1U	NA
	January 2002	<0.4U	<0.4U	0.9J	<0.3U	NA
	August 2002	<0.5	<0.5	<0.5	<0.5	NA
	January 2003	<0.4U	0.3J	0.7J	<0.3U	NA
	July 2003	<0.4U	<0.4U	0.3J	<0.3U	NA
	July 2004	0.5U	0.26J	0.57	0.5U	2.5
	April 2005	0.13J	0.28J	0.69	0.5U	2.6
	October 2005	0.5U	0.26J	0.72	0.5U	3.4
	April 2006	0.5U	0.25J	0.46J	0.5U	1J
	October 2006	0.5U	0.25J	0.47J	0.5U	20R
	April 2007	0.5U	0.5U	0.7J	0.5U	NA
	December 2007	0.5U	0.5U	0.48J	0.5U	2.1U
MRMW-10B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	<0.1U	<0.1U	<0.1U	NA
	January 2002	<0.4U	<0.4U	<0.3U	<0.3U	NA
	August 2002	<0.5	<0.5	<0.5	<0.5	NA
	January 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	0.86J
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2005	0.5U	0.5U	0.1J	0.5U	2U
	April 2006	0.5U	0.5U	0.5U	0.5U	20UJ
	October 2006	0.5U	0.5U	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.5U	0.5U	0.5U	0.5U	2.1U
MRMW-11B	October 1999	29	15	190	11	NA
	December 2000	<3U	36	180	10	NA
	June 2001	24.4	12.3	64.6	4.8	NA
	January 2002	17	6	32	3	NA
	August 2002	28	8.5	56	3.8	NA
	January 2003	17	8	37	3	NA
	July 2003	14J	9J	44J	4J	NA
	July 2004	18	9.3	25	2.9	7
	April 2005	23	10	30	3.8	7.2
	October 2006	18	7.1	40	6.4	20R
	April 2007	17	5.4	24	3.5	NA
	December 2007	19J	8.3	19	3.5	2U
MRMW-11C	October 1999	4 J	6 J	120	6 J	NA
	December 2000	40	11	130	7	NA
	June 2001	35.2	7.3	86.0	5.3	NA
	January 2002	28	8	86.0	6	NA
	August 2002	37	9.6	69.0	4.7	NA
	January 2003	35	9	73.0	5	NA
	July 2003	22	4	45	3	NA
	July 2004	14	4.5	28	2.8	5.7
	April 2005	22	5	32	3.6	5.9
	October 2006	11	3	16	2.4	20R
	April 2007	18	5	19	3.3	NA
	December 2007	8.2	2	12	1.7	2.1U

Table 2
Historical Summary of Groundwater Analytical Results
Mohonk Road Industrial Plant
High Falls, New York

Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
MRMW-12B	October 1999	72	37	380	23 J	NA
	December 2000	43	18	220	15	NA
	June 2001	67.2	26.8	256	19.6	NA
	January 2002	77	32	276	22	NA
	August 2002	65	36	240	23	NA
	January 2003	72	30	219	18	NA
	July 2003	52	25	174	16	NA
	July 2004	39	24	96	12	11
	April 2005	87	54	150	22	25
	October 2006	47	31	76	14	31J
	April 2007	56	29	72	13	NA
	December 2007	15	6.2	26	4.3	2.1U
MRMW-13B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	<0.1U	<0.1U	<0.1U	NA
	January 2002	<0.4U	<0.4U	<0.3U	<0.3U	NA
	August 2002	<0.5	<0.5	<0.5	<0.5	NA
	January 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2005	0.5U	0.5U	0.5U	0.5U	2U
	April 2006	0.5R	0.5R	0.5R	0.5R	2R
	October 2006	0.5U	0.5U	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	1.1	NA
	December 2007	0.5U	0.5U	0.5U	0.5U	2.1U
MRMW-14B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	0.4J	<0.1U	<0.1U	NA
	January 2002	0.5J	1	<0.3U	<0.3U	NA
	August 2002	NS	NS	NS	NS	NA
	January 2003	<0.4U	0.8J	<0.3U	<0.3U	NA
	July 2003	<0.4U	0.6J	<0.3U	<0.3U	NA
	July 2004	0.5U	0.58	0.5U	0.5U	1.6J
	April 2005	0.3J	0.8	0.5U	0.15J	1.9J
	October 2005	0.25J	0.62	0.5U	0.5U	2
	April 2006	0.5U	0.67	0.5U	0.5U	2R
	October 2006	0.5U	0.72	0.5U	0.5U	2U
	April 2007	0.5U	0.82	0.5U	0.5U	NA
	December 2007	0.3J	0.76	0.5U	0.5U	2.1U
MRMW-15B	October 1999	39	30	380	4 J	NA
	December 2000	63	37	250	<3U	NA
	June 2001	63.6	35.4	377	3.8	NA
	January 2002	73	40	482	4	NA
	August 2002	54	31	330	5	NA
	January 2003	68	36	380	3	NA
	July 2003	38	30	327	3	NA
	July 2004	56	37	310	3	9.9
	April 2005	48	36	320	3.6	9.3
	October 2006	38	25	180	3.1	40R
	April 2007	60	30	200	3.9	NA
	December 2007	43	25	170	3.5	4

Table 2
Historical Summary of Groundwater Analytical Results
Mohonk Road Industrial Plant
High Falls, New York

Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
MRMW-16	July 2003	51	12	168	4	NA
	July 2004	60	10	160	8.8	8.9
	October 2006	60	25	140	12	40R
	April 2007	1.7	0.5U	2.9	0.5U	NA
	December 2007	53	11	140	8.8	5.1L
MRMW-17-1	July 2003	63	21	175	11	NA
	July 2004	51	16	150	8.7	18
	April 2005	49	10	110	7.8	14
	April 2006	30	16	70J	7.6	8.4
	October 2006	38	16	79	7.9	20R
	April 2007	58	16	80	8.4	NA
	December 2007	37	12	77	6.4	4.3
MRMW-17-2	July 2003	60	22	160	10	NA
	July 2004	49	18	130	10	15
	April 2005	53	13	130	6.8	15
	April 2006	50	15	100	4.5J	11
	October 2006	37	18	73	5.8	20R
	April 2007	50	16	79	5.4	NA
	December 2007	26	15	49	5.3	4.8
MRMW-17-3	July 2003	38	24	96	5	NA
	July 2004	41	21	120	1.6	14
	April 2005	46	13	110	1.4	15
	April 2006	36	16	63	0.6	10
	October 2006	35	19	65	0.74	20R
	April 2007	49	17	73	0.6	NA
	December 2007	30	16	56	0.55	4.7
MRMW-18-1	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.34J	0.5U	0.5U	1.7J
	October 2004	0.23J	0.43J	0.5U	0.5U	2U
	April 2005	0.24J	0.71	0.5U	0.5U	0.78J
	October 2005	0.17J	0.49J	0.5U	0.5U	1J
	April 2006	0.5U	0.32J	0.5U	0.5U	2R
	October 2006	0.5U	0.3J	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.5U	0.32J	0.5U	0.5U	2.1U
MRMW-18-2	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.17J	0.5U	0.5U	1.7J
	October 2004	0.5U	0.23J	0.5U	0.5U	2U
	April 2005	0.5U	0.22J	0.5J	0.5J	0.77J
	October 2005	0.5U	0.26J	0.5U	0.5U	0.52J
	April 2006	0.5U	0.19J	0.5U	0.5U	2R
	October 2006	0.5U	0.19J	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.5U	0.5U	0.5U	0.5U	2U
MRMW-18-3	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.24J	0.5U	0.5U	2U
	October 2004	0.17J	0.4J	0.5U	0.5U	2U
	April 2005	0.19J	0.55	0.5U	0.5U	0.73J
	October 2005	0.15J	0.49J	0.5U	0.5U	0.57J
	April 2006	0.5U	0.27J	0.5U	0.5U	2R
	October 2006	0.5U	0.39J	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.5U	0.3J	0.5U	0.5U	2.1U

Table 2
Historical Summary of Groundwater Analytical Results
Mohonk Road Industrial Plant
High Falls, New York

Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
MRMW-19-1	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	1.4J
	October 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	0.87J
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.5U	0.5U	0.5U	0.5U	2U
MRMW-19-2	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	October 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.5U	0.5U	0.5U	0.5U	2.1U
MRMW-19-3	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	October 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.5U	0.5U	0.5U	0.5U	2.1U
MRMW-20-1	July 2003	<0.4U	<0.4U	0.3J	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.5U	0.5U	0.5U	0.5U	2U
MRMW-20-2	July 2003	<0.4U	<0.4U	0.3J	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.5U	0.5U	0.5U	0.5U	2.1U
MRMW-20-3	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
	December 2007	0.5U	0.5U	0.5U	0.5U	2U
ERT-1	October 1999*	170	94	1400	100	NA
	December 1999	130	36J	1200	53	NA
	December 2000	87J	29J	390	34J	NA
	June 2001	75.0	18.8	416	24.0	NA
	January 2002	69.0	25	488	24.0	NA
	August 2002	140.0	65	940	33.0	NA
	January 2003	78	22	506	24	NA
	July 2003	72	18	322	21	NA
	July 2004	59	17	240	17	NA
	March 2005	90	27	410	27	20
	November 2005	60	15	300	16	18
	May 2006	73	17	360	18	NA
	October 2006	36	17	170	13	8.6
	April 2007	44	53	240	2	NA
	December 2007	32	49	330	2.1	2.1U

Table 2
Historical Summary of Groundwater Analytical Results
Mohonk Road Industrial Plant
High Falls, New York

Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
ERT-2	October 1999	5 J	15	420	12	NA
	December 2000	21	12	220	7	NA
	June 2001	20.3	5.5	142	8.0	NA
	January 2002	38	20	358	16.0	NA
	August 2002	36	16	290	14.0	NA
	January 2003	34	10	202	13	NA
	July 2003	28	8	112	9	NA
	July 2004	14	6.2	41	4.7	4.1
	April 2005	25	21	180	2.8	4.8
	October 2005	12	12	150	8.4	21
	April 2006	8	2.3	28	2.5	2R
	October 2006	1.7	0.48J	7.5	1.4	2.1
	April 2007	14	3.2	62	3	NA
	December 2007	5	2.4	25	1.9	2.2U
ERT-3	October 1999	11	2J	130	52	NA
	December 2000	99J	20	600	85	NA
	June 2001	47.6	9.0	328	70.4	NA
	January 2002	40	8.0	279	75	NA
	August 2002	42	9.4	250	73	NA
	January 2003	44	8	320	86	NA
	July 2003	60	11	389	79	NA
	July 2004	23	9.9	200	56	83
	April 2005	34	16	250	75	66
	April 2006	23	9.7	170	35	30
	October 2006	18	9.5	110	30	65J
	April 2007	24	10	140	28	NA
	December 2007	32	18	210	39	7.6
ERT-4	October 1999	490J	160	6400J	460J	NA
	December 2000	220	190J	3600	390J	NA
	June 2001	920	196	13,800	800	NA
	January 2002	1090	134	16,900	908	NA
	August 2002	1200	190	16,000	640	NA
	January 2003	539	107	7080	369	NA
	July 2003	402	68	5080	248	NA
	July 2004	600	130	9000	440	6.8
	April 2005	510	150	6500	320	24
	April 2006	350	160J	4700	170	12
	October 2006	270	120	3500	210	1000R
	April 2007	3.7	1.6	28	9.2	NA
	December 2007	850	110J	8400	300	4.7

Notes:

1. Other various VOCs were detected during the sampling rounds at varying locations and concentrations. Complete analytical results for prior sampling events have been included in previous reports.
2. All data expressed in concentrations of micrograms per liter (ug/L) or parts per billion (ppb)
3. August 2002 samples collected by USEPA and analyzed at two laboratories.

Abbreviations:

U = Non-detect compound
J = Estimated value
NS = Not Sampled
* Analytical results from this sample (October 1999) are considered questionable due to soil and sediment loading in the well.

TABLE 3
Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Tap Water	1,1-Dichlrorethene	15	53	µg/l	6-6	46.78	µg/l	99% Cheb
	1,1-Dichloroethane	6.2	25	µg/l	6/6	19.84	µg/l	99% Cheb
	1,1,1-Trichloroethane	26	170	µg/l	6-6	130.9	µg/l	99% Cheb
	Trichloroethene	0.55	8.8	µg/l	6-6	7.1	µg/l	95% t-UCL

95% t-UCL-Student t-Test
99% Cheb – 99% Chebyshev (mean, Sd) Upper-confidence limit

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs detected in groundwater (i.e., the concentration that will be used to estimate the exposure and risk from each COC). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived.

TABLE 4
Selection of Exposure Pathways

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/ Future	Groundwater	Groundwater	Tap Water	Residents	Adult	Ingestion	Off-Site (Far Field Plume)	Quant	Current and future residents may use groundwater as a potable supply of water.
					Child	Ingestion	Off-Site (Far Field Plume)	Quant	Current and future residents may use groundwater as a potable supply of water.

Quant = Quantitative risk analysis performed.

Summary of Selection of Exposure Pathways

The table describes the exposure pathways associated with the groundwater that were evaluated for the risk assessment, and the rationale for the inclusion of each pathway. Exposure media, exposure points, and characteristics of receptor populations are included.

TABLE 5
Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Trichloroethene	4.1-01	$(mg/kg/day)^{-1}$	4.1E-01	$(mg/kg/day)^{-1}$	NA	NCEA	05/08

Key:

CalEPA – California Environmental Protection Agency
EPA – U.S. Environmental Protection Agency
IRIS: Integrated Risk Information System. U.S. EPA
na: No information available

EPA Weight of Evidence:

A - Human carcinogen
B1 - Probable Human Carcinogen-Indicates that limited human data are available
B2 - Probable Human Carcinogen-Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E- Evidence of noncarcinogenicity

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in groundwater. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 6
Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Trichloroethene	3E-05	-----	-----	3E-05
						Total Risk =	3E-05

na – not applicable
Inhalation – Inhalation at showerhead

Summary of Risk Characterization - Carcinogens

The table presents cancer risks for groundwater exposure for the ingestion pathway. As stated in the National Contingency Plan, the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}.

Table 7
GW-3 Cost Projection
Mohonk Road Industrial Plant
High Falls, New York

Item	Description	Quantity	Unit Cost	Unit	Extension
CAPITAL COSTS					
1.	Work Plans/HASP	1	$ 12,720	LS	$ 12,720
ANNUAL LONG TERM MONITORING COSTS (YEARS 1 TO 5)					
2.	Project Planning and Organizing	1	$ 9,600	LS	$ 9,600
3.	Field Sampling Labor	1	$ 79,200	LS	$ 79,200
4.	Sampling Equipment, Shipping, Consumable Supplies	1	$ 40,128	LS	$ 40,128
5.	Sample Analysis and Data Validation	1	$ 75,200	EA	$ 75,200
6.	Data Evaluation and Reporting	1	$ 36,960	LS	$ 36,960
	Total Annual Long Term Monitoring Costs				$ 241,088
ANNUAL LONG TERM MONITORING COSTS (YEARS 6 TO 10)					
7.	Project Planning and Organizing	1	$ 9,600	LS	$ 9,600
8.	Field Sampling Labor	1	$ 72,000	LS	$ 72,000
9.	Sampling Equipment, Shipping, Consumable Supplies	1	$ 36,480	LS	$ 36,480
10.	Sample Analysis and Data Validation	1	$ 67,200	EA	$ 67,200
11.	Data Evaluation and Reporting	1	$ 36,960	LS	$ 36,960
	Total Annual Long Term Monitoring Costs				$ 222,240
ANNUAL LONG TERM MONITORING COSTS (YEARS 11 TO 30)					
12.	Project Planning and Organizing	1	$ 9,600	LS	$ 9,600
13.	Field Sampling Labor	1	$ 50,400	LS	$ 50,400
14.	Sampling Equipment, Shipping, Consumable Supplies	1	$ 25,536	LS	$ 25,536
15.	Sample Analysis and Data Validation	1	$ 41,600	EA	$ 41,600
16.	Data Evaluation and Reporting	1	$ 36,960	LS	$ 36,960
	Total Annual Long Term Monitoring Costs				$ 164,096
ANNUAL OPERATIONS AND MAINTENANCE COSTS					
17.	Annual O&M Costs at Existing Treatment System (Near-Field Plume)	1	$ 375,360	LS	**$ 375,360**
18.	Annual O&M Costs for the Soil Vapor Extraction System	1	$ 400,000	LS	**$ 400,000**
FIVE-YEAR REVIEW					
19.	Five-Year Review/Reporting	1	$ 15,600	LS	$ 15,600
PRESENT WORTH OF COSTS					
20.	Total Capital Costs				$ 12,720
21.	Annual O&M Costs of Treatment System (30 year duration)				$ 4,657,842
22.	Annual O&M Costs of Soil Vapor Extraction System (3 year duration)				$ 1,049,720
23.	Long-term Monitoring Cost (30 year duration)				$ 2,521,934
24.	Five-Year Review Costs (30 year duration)				$ 33,662
	TOTAL PRESENT WORTH				**$ 8,276,000**

Table 8
GW-3 Detailed Cost Backup
Mohonk Road Industrial Plant
High Falls, New York

CAPITAL COSTS:					
No.	**1**	**Work Plans/HASP**			
			Hourly wage	Hours	Subtotals
		Project Manager	$ 120	16	$ 1,920
		Engineer	$ 90	120	$ 10,800
		No. 1 Total:			**$ 12,720**

ANNUAL LONG-TERM GROUNDWATER MONITORING (No. 2-6)
Years 1 through 5

No.	**2**	**Management & Mobilization of Sampling Event**			
		Events per year:		4	
			Hourly wage	Hours	Subtotals
		Project Manager	$ 120	4	$ 480
		Engineer	$ 90	16	$ 1,440
		Purchasing Specialist	$ 60	8	$ 480
		cost per event			$ 2,400
		No. 2 Annual Total:			**$ 9,600**
No.	**3**	**Sampling Labor**			
		Monitoring Wells	Wells/day	Number of Wells	Subtotal Days
		Standard Wells	3	18	6
		FLUTe Wells	1	3	3
		Days Mob/Demob			2
		Total Days			11
			Hourly wage	Hours/Day	Subtotals
		Sampler 1	$ 90	10	$ 9,900
		Sampler 2	$ 90	10	$ 9,900
		cost per event			$ 19,800
		No. 3 Annual Total:			**$ 79,200**
No.	**4**	**Sampling Equipment**			
			Rate	Subtotals	
		Shipping	$ 150	$ 1,650	
		Sampling Equipment	$ 150	$ 1,650	
		Monitoring Equipment	$ 100	$ 1,100	
		PPE (2-person team)	$ 40	$ 440	
		Vehicle Rental	$ 90	$ 990	
		Per Diem	$ 282	$ 3,102	
		Misc	$ 100	$ 1,100	
		cost per event		$ 10,032	
		No. 4 Annual Total:			**$ 40,128**
No.	**5**	**Sample Analysis and Validation**			
		Monitoring Wells	Samples/Well	Enivronmental Samples	Field Duplicates
		Standard Wells	1	18	1
		FLUTe Wells	3	9	1
		Field Blanks		9	
		Trip Blanks		9	
		Total Samples		47	
		VOC Analysis	$ 160		$ 7,520
		1,4-dioxane Analysis	$ 150		$ 7,050
		analytical costs per event			$ 14,570
		annual analytical costs			$ 58,280
			Hourly wage	Hours/Sample	Subtotal
		Data Validator	$ 90	1	$ 4,230
		validation cost per event			$ 4,230
		annual vaildation costs			$ 16,920.00
		Analysis and Validation cost per event			$ 18,800
		No. 5 Annual Total:			**$ 75,200**
No.	**6**	**Data Review & Reporting (Annual Monitoring)**			
			Hourly wage	Hours	Subtotals
		Senior Engineer	$ 120	8	$ 960
		Engineer	$ 90	92	$ 8,280
		cost per event			$ 9,240
		No. 6 Annual Total:			**$ 36,960.00**
Total Annual Long Term Monitoring Costs (no. 1 to 6)					**$ 241,088.00**

PRESENT WORTH OF COSTS

Assume discount rate is 7%:

Long-term Monitoring Cost (30 year duration)

This cost occurs every 1 years
for 5 years.

Objective: Find P Given A, i, n, or Given P/A, i, n

P = Present Worth — n, the number of years, = 5
A = Annual amount — i, the nominal discount rate, = 7.00%

Looking up the interest rate tables for i = 7% and n = 5 years:

The multiplier for (P/A) = **4.1002**

Present Value of Long-term Monitoring Cost (years 1 to 5): $ 988,509

Table 8
GW-3 Detailed Cost Backup
Mohonk Road Industrial Plant
High Falls, New York

ANNUAL LONG-TERM GROUNDWATER MONITORING (No. 7-10)
Years 6 through 10

No.	**7**	**Management & Mobilization of Sampling Event**				
		Events per year:			4	
			Hourly wage	Hours		Subtotals
		Project Manager	$ 120	4	$	480
		Engineer	$ 90	16	$	1,440
		Purchasing Specialist	$ 60	8	$	480
		cost per event			$	2,400
		No. 7 Annual Total:			**$**	**9,600**
No.	**8**	**Sampling Labor**				
		Monitoring Wells	Wells/day	Number of Wells		Subtotal Days
		Standard Wells	3	15		5
		FLUTe Wells	1	3		3
		Days Mob/Demob				2
		Total Days				10
			Hourly wage	Hours/Day		Subtotals
		Sampler 1	$ 90	10	$	9,000
		Sampler 2	$ 90	10	$	9,000
		cost per event			$	18,000
		No. 8 Annual Total:			**$**	**72,000**
No.	**9**	**Sampling Equipment**				
			Rate/day			Subtotals
		Shipping	$ 150		$	1,500
		Sampling Equipment	$ 150		$	1,500
		Monitoring Equipment	$ 100		$	1,000
		PPE (2-person team)	$ 40		$	400
		Vehicle Rental	$ 90		$	900
		Per Diem	$ 282		$	2,820
		Misc	$ 100		$	1,000
		cost per event			$	9,120
		No. 9 Annual Total:			**$**	**36,480**
No.	**10**	**Sample Analysis and Validation**				
		Monitoring Wells	Samples/Well	Enivronmental Samples		Field Duplicates
		Standard Wells	1	15		1
		FLUTe Wells	3	9		1
		Field Blanks			8	
		Trip Blanks			8	
		Total Samples			42	
		VOC Analysis	$ 160		$	6,720
		1,4-dioxane Analysis	$ 150		$	6,300
		analytical costs per event			$	13,020
		annual analytical costs			$	52,080.00
			Hourly wage	Hours/Sample		Subtotal
		Data Validator	$ 90	1	$	3,780
		validation cost per event			$	3,780
		annual vaildation costs			$	15,120.00
		Analysis and Validation cost per event			$	16,800
		No. 10 Annual Total:			**$**	**67,200**
No.	**11**	**Data Review & Reporting (Annual Monitoring)**				
		0	Hourly wage	Hours		Subtotals
		Senior Engineer	$ 120		8 $	960
		Engineer	$ 90		92 $	8,280
		cost per event			$	9,240
		No. 11 Annual Total:			**$**	**36,960**
Total Annual Long Term Monitoring Costs (no. 7 to 11)					**$**	**222,240**

PRESENT WORTH OF COSTS

Assume discount rate is 7%:

Long-term Monitoring Cost (30 year duration)

This cost occurs every 1 years

for 5 years.

Objective: Find P Given A, i, n, or Given P/A, i, n

P = Present Worth — n, the number of years, = 5

A = Annual amount — i, the nominal discount rate, = 7.00%

Looking up the interest rate tables for i = 7% and n = 5 years:

The multiplier for (P/A) = **4.1002**

Value at year beginning year 6	**$**	**911,228**
Present Value of Long-term Monitoring Cost (years 6 to 10):	**$**	**649,693**

Table 8
GW-3 Detailed Cost Backup
Mohonk Road Industrial Plant
High Falls, New York

ANNUAL LONG-TERM GROUNDWATER MONITORING (No. 12-15)
Years 11 through 30

No.	**12**	**Management & Mobilization of Sampling Event**				
		Events per year:		4		
			Hourly wage	Hours		Subtotals
		Project Manager	$ 120	4	$	480
		Engineer	$ 90	16	$	1,440
		Purchasing Specialist	$ 60	8	$	480
		cost per event			$	2,400
		No. 12 Annual Total:			**$**	**9,600**
No.	**13**	**Sampling Labor**				
		Monitoring Wells	Wells/day	Number of Wells		Subtotal Days
		Standard Wells	3	11		4
		FLUTe Wells	1	1		1
		Days Mob/Demob				2
		Total Days				7
			Hourly wage	Hours/Day		Subtotals
		Sampler 1	$ 90	10	$	6,300
		Sampler 2	$ 90	10	$	6,300
		cost per event			$	12,600
		No. 13 Annual Total:			**$**	**50,400**
No.	**14**	**Sampling Equipment**				
			Rate/day			Subtotals
		Shipping	$ 150		$	1,050
		Sampling Equipment	$ 150		$	1,050
		Monitoring Equipment	$ 100		$	700
		PPE (2-person team)	$ 40		$	280
		Vehicle Rental	$ 90		$	630
		Per Diem	$ 282		$	1,974
		Misc	$ 100		$	700
		cost per event			$	6,384
		No. 14 Annual Total:			**$**	**25,536**
No.	**15**	**Sample Analysis and Validation**				
		Monitoring Wells	Samples/Well	Enivronmental Samples		Field Duplicates
		Standard Wells	1	11		1
		FLUTe Wells	3	3		1
		Field Blanks		5		
		Trip Blanks		5		
		Total Samples		26		
		VOC Analysis	$ 160		$	4,160
		1,4-dioxane Analysis	$ 150		$	3,900
		analytical costs per event			$	8,060
		annual analytical costs			$	32,240.00
			Hourly wage	Hours/Sample		Subtotal
		Data Validator	$ 90	1	$	2,340
		validation cost per event			$	2,340
		annual vaildation costs			$	9,360.00
		Analysis and Validation cost per event			$	10,400
		No. 15 Annual Total:			**$**	**41,600**
No.	**16**	**Data Review & Reporting (Annual Monitoring)**				
			Hourly wage	Hours	Subtotals	
		Senior Engineer	$ 120	8	$	960
		Engineer	$ 90	92	$	8,280
		cost per event			$	9,240
		No. 16 Annual Costs:			**$**	**36,960**
Total Annual Long Term Monitoring Costs (12 to 16)					**$**	**164,096**
PRESENT WORTH OF COSTS						
		Assume discount rate is 7%:				
		Long-term Monitoring Cost (30 year duration)				
		This cost occurs every	1	years		
		for	20	years.		
	Objective: Find P Given A, i, n, or Given P/A, i, n					
	P = Present Worth			n, the number of years, =	20	
	A = Annual amount			i, the nominal discount rate, =	7.00%	
		Looking up the interest rate tables for i = 7% and n = 20 years:				
		The multiplier for (P/A) =		**10.594**		
		Value at year beginning year 11			**$**	**1,738,433**
Present Value of Long-term Monitoring Cost (years 11 to 30):					**$**	**883,731**

Table 8
GW-3 Detailed Cost Backup
Mohonk Road Industrial Plant
High Falls, New York

No.	**17**	**Existing Groundwater Treatment Plant Annual O&M Cost (Near-Field Plume)**				
	Labor Cost:					
			Hourly wage	Hours/week		
		Technician	$ 75	24	$	1,800
		PM/Supervision @ 20%			$	360
		Office support @ 20 %			$	360
				Weekly subtotal:	$	2,520
				Months of Operation:		12
				Total Labor Costs:	**$**	**131,040**
	Process Monitoring Cost:					
	Sample analysis/shipping cost		$ 300	/shipment		
	Frequency of sampling		1	/month		
	Number of samples per unit		10	/month		
	Number of QA/QC samples per unit		5	/month		
	Total samples		15	/month		
				Monthly subtotal:	$	4,500
				Months of Operation:		12
				Total Process Monitoring Costs:	**$**	**54,000**
	Power Cost:					
	Unit cost of Power per KWh		$ 0.11			
	Total power consumption		260,000	KWh/yr		
				Total Power Costs:	**$**	**28,600**
	Maintenance Cost:					
		Estimated Maintenance Cost (5% of building and Treatment system costs)			$	94,160
	-Includes costs for oxidizing agents					
	Miscellaneous expenses				$	5,000
	Total Maintenance Costs:				**$**	**99,160**
	Subtotal:				**$**	**312,800**
	Contingency Costs (20%):				**$**	**62,560**
		No. 17 Annual Total:			**$**	**375,360**
	PRESENT WORTH CALCULATIONS OF O&M COSTS					
		Assume discount rate is 7%:				
		Long-term Monitoring Cost (30 year duration)				
		This cost occurs every	1	years		
		for	30	years.		
	Objective: Find P Given A, i, n, or Given P/A, i, n					
	P = Present Worth			n, the number of years, =	30	
	A = Annual amount			i, the nominal discount rate, =	7.00%	
		Looking up the interest rate tables for i = 7% and n = 30 years:				
		The multiplier for (P/A) =		**12.409**		
Present Value of Annual O&M Cost:					**$**	**4,657,842**
No.	**18**	**Soil Vapor Extraction System Annual O&M Cost**				
		Lump Sum Annual Cost			$	400,000
		No. 18 Annual Total:			**$**	**400,000**
	PRESENT WORTH CALCULATIONS OF O&M COSTS					
		Assume discount rate is 7%:				
		Annual O&M Cost (3 year duration)				
		This cost occurs every	1	years		
		for	3	years.		
	Objective: Find P Given A, i, n, or Given P/A, i, n					
	P = Present Worth			n, the number of years, =	3	
	A = Annual amount			i, the nominal discount rate, =	7.00%	
		Looking up the interest rate tables for i = 7% and n = 3 years:				
		The multiplier for (P/A) =		**2.6243**		
Present Value of Annual O&M Cost:					**$**	**1,049,720**

Table 8
GW-3 Detailed Cost Backup
Mohonk Road Industrial Plant
High Falls, New York

FIVE-YEAR REVIEW

No.	**19**	**Five-Year Review**					
		Groundwater monitoring data review and report preparation.					
		This cost occurs every	5	years			
		for	30	years.			
			Hourly wage		Hours		Subtotals
		Senior Engineer	$ 120		40	$	4,800
		Engineer	$ 90		120	$	10,800
		No. 19 Total:		**$**			**15,600**

PRESENT WORTH CALCULATIONS OF REVIEW COSTS

Five-Year Review Costs (30 year duration)

This cost occurs every 5 years
for 30 years.

Objective: to calculate the effective interest rate i_e

Given:
i, the nominal discount rate, = 7.00%
n, the number of years, = 30
m, # of compounding periods = 5

$i_e = (1+i)^m - 1 =$ 0.403 ≈ 40%

$$P = A^* \frac{(1+i)^n - 1}{i(1+i)^n}$$

In this case, there are	6		5 -year periods.
When		n =	6
and		i =	0.403
P, the multiplier =			**2.158**

Present Value of Five Year Reviews: $ 33,662

Table 9
Estimated Timeframes for Achievement of Aquifer Restoration Goals by COCs via MNA under Alternative GW-3

COCs	Near-field Locations[1] Time Range (yrs)	Far-field Locations[2] Time Range (yrs)
TCE	2 to 56	0 to 16
TCA	6 to 25	4 to 44
1,1-DCE	0 to 28	8 to 24
1,1-DCA	0 to 22	0 to 1

Notes:

1. Range represents monitoring well locations MW-4, MW-5B, MW-5R, MW-6B, MW-7R, ERT-1, ERT-2, ERT-3, and ERT-4.
2. Range represents monitoring well locations MW-11B, MW-11C, MW-12B, MW-15B, MW-17-1, MW-17-2, and MW17-3.
3. Zeros indicated at the low end of some of the above time ranges indicate that ARAR goals at some of the monitoring well locations have already been achieved.
4. All data are derived from Tables 1 to 4 of the 2008 MNAA Report.

Abbreviations:

1,1-DCE	1,1-dichloroethene
1,1-DCA	1,1-dichloroethane
COCs	Contaminants of Concern
MNA	Monitored Natural Attenuation
TCE	trichloroethene
TCA	1,1,1-trichloroethane
yrs	years

APPENDIX III.

ADMINISTRATIVE RECORD INDEX

MOHONK ROAD INDUSTRIAL PLANT SITE
ADMINISTRATIVE RECORD UPDATE #5
INDEX OF DOCUMENTS

5.0 RECORD OF DECISION

5.2 Amendment to the Record of Decision

P. 500306 - 500306 Report: Final Monitored Natural Attenuation Assessment, Mohonk Road Industrial Plant Superfund Site, prepared by U.S. Army Corps of Engineers, prepared for U.S. EPA, Region 2, April 11, 2008.

P. 500307 - 500307 Superfund Post-Decision Proposed Plan, Mohonk Road Industrial Plant Superfund Site, Ulster County, New York, prepared by U.S. EPA, Region 2, July 2008.

P. 500308 - 500308 Mohonk Road Industrial Plant Superfund Site, 500308 EPA ID: NYD986950012, Project Documentation, prepared by CDM, prepared for U.S. EPA, Region 2, July 2008.

P. 500309 - 500310 Memorandum to Mr. Sal Badalamenti, Remedial Project Manager, ERRD/NYRB/Eastern New York Section, U.S. Environmental Protection Agency, Region 2, from Mr. Michael Sivak, Risk Assessor, ERRD/PSB/Technical Support Team, U.S. Environmental Protection Agency, Region 2, re: Risk Evaluation for Groundwater at Mohonk Road Industrial Park, May 13, 2008.

P. 500311 - 500311 Memorandum to Mr. Jeff Catanzarita, U.S. EPA/ERT Work Assignment Manager, from Mr. Michael Hoppe, REAC Task Leader, Lockheed Martin Technology Services, re: Mohonk Road Industrial Plant Superfund Site, High Falls, NY, WA #0-122 – Amended Trip Report, August 19, 2005.

P. 500312 500312 Report: Remediation System Evaluation, Mohonk Road Industrial Plant Superfund Site, High Falls, New York, November 29, 2005.

P. 500313 500313 Memorandum to Mr. Jeff Catanzarita, U.S. EPA/ERT Work Assignment Manager, from Mr. Michael Hoppe, REAC Task Leader, Lockheed Martin Technology Services, re: Mohonk Road Industrial Plant Superfund Site, High Falls, NY, WA #0-122 – Trip Report, May 9, 2006.

P. 500314 500314 Memorandum to Mr. Jeff Catanzarita, U.S. EPA/ ERT Work Assignment Manager, from Mr. Michael Hoppe, REAC Task Leader, Lockheed Martin Technology Services, re: Mohonk Road Industrial Plant Superfund Site, High Falls, NY, WA #0-122 – Trip Report – Commercial Facility Sampling, June 27, 2006.

P. 300315 300317 Memorandum to Mr. George Pavlou, Director, Emergency and Remedial Response Division, U.S. Environmental Protection Agency, Region 2, from Mr. John E. LaPadula, P.E., Branch Chief, New York Remediation Branch, U.S. Environmental Protection Agency, Region 2, re: Action Memorandum: Authorization to continue Long Term Remedial Action Activities at the Mohonk Road Industrial Plant Superfund Site, Ulster County, New York, September 18, 2006.

APPENDIX IV.

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation, 12th Floor
625 Broadway, Albany, New York 12233-7011
Phone: (518) 402-9706 • **FAX:** (518) 402-9020
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

SEP 30 2008

Mr. George Pavlou
Acting Director
Emergency and Remedial Response Division
USEPA Region II
290 Broadway
New York, NY 10007-1866

Re: Record of Decision Amendment (September 2008)
Mohonk Road Industrial Plant,
Site # 3-56-023, Marbletown (T), Ulster County

Dear Mr. Pavlou,

The New York State Department of Environmental Conservation (Department) in consultation with the New York State Department of Health (NYSDOH) have reviewed the September 2008 Record of Decision (ROD) Amendment to the March 2000 ROD for the Mohonk Road Industrial Plant Site in the Town of Marbletown, Ulster County. Based on the review, I understand that the components of the remedy already implemented include removal and disposal of contaminated soils which were a source to groundwater contamination; construction and operation of a new public water supply system providing an alternate water supply to those with impacted or threatened private supply wells; and an institutional control preventing future use of the aquifer within the High Falls Water District (HFWD) via ordinances of the Towns of Marbletown and Rosendale, prohibiting establishment or maintenance of a source of drinking or domestic water separate from the public water supply of the HFWD. Further, I understand ongoing components of the remedy include the active remediation of contaminated groundwater by the continued operation of a groundwater extraction and treatment system to address the near-field plume at the source.

I understand that the Amendment to the March 2000 ROD will change the remedy for the far-field plume from the construction and operation of a groundwater extraction and treatment system, to monitored natural attenuation in conjunction with the long-term groundwater monitoring. I understand the remedy also includes continued operation and maintenance of Soil Vapor Extraction (SVE) systems in the on-site building and former source area.

Based on this information, I concur with the remedy and believe it is protective of human health and the environment. If you have any questions, please contact Mr. David Crosby at (518) 402-9662.

Sincerely,

Dale A. Desnoyers, Director
Division of Environmental Remediation

APPENDIX V.

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
Record of Decision Amendment
Mohonk Road Industrial Plant Superfund Site

INTRODUCTION
A responsiveness summary is required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) §300.430(f)(3)(i)(A), promulgated under the Superfund statute, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) U.S.C. 42 Chapter 103. It provides a summary of citizens' comments and concerns received during the public comment period, as well as the response of the United States Environmental Protection Agency (EPA) to those comments and concerns. All comments summarized in this document have been considered by EPA in making its decision as embodied in the Record of Decision Amendment for the Mohonk Road Industrial Plant (MRIP) Superfund Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES
The original lead agency for the Site, the New York State Department of Environmental Conservation (NYSDEC), prepared a Citizen Participation Plan for the Site, dated June 1997. The Citizen Participation Plan included a community profile and contact list, and has also been used by EPA for its community outreach efforts at the Site. The complete Administrative Record including Site reports has been made available for public review at information repositories at the EPA Docket Room in Region 2, New York and the Stone Ridge Library, Stone Ridge, New York. Site reports have also been made available at the Rosendale Public Library.

The Post-Decision Proposed Remedial Action Plan (or Post-Decision Proposed Plan) was prepared by EPA, with consultation by NYSDEC, and finalized in July 2008. A notice of the Post-Decision Proposed Plan and public comment period was placed in the Blue Stone Press on July 4, 2008 consistent with the requirements of the NCP, and a summary of the Post-Decision Proposed Plan was mailed to all persons on the Site mailing list. The Post-Decision Proposed Plan was made available for review at the information repositories for the Site and at the EPA website (www.epa.gov/region02/superfund/npl/mohonkroad/). The public comment period was scheduled from July 7, 2008 to August 6, 2008. EPA hosted a public meeting on July 17, 2008 to discuss the Post-Decision Proposed Plan. At this meeting, representatives from EPA, NYSDEC, and the New York State Department of Health (NYSDOH) answered questions about the contamination at the Site and the remedial alternatives.

OVERVIEW
Groundwater Alternative GW-3, continued operation of the existing groundwater extraction and treatment system within the near field plume including extraction of contaminated groundwater from three recovery wells on the MRIP Property, treatment with an air stripper, and carbon polishing, with vapor-phase carbon treatment of air releases; monitored natural attenuation(MNA) within the far field plume; long-term monitoring of groundwater; and institutional controls was proposed to restore the aquifer to its most beneficial use.

Concerns were expressed by the public regarding potential operational impacts of the High Falls Water District (HFWD) drinking water facility as well as the proposed amended remedy. The key concerns involved flooding within the HFWD, the estimation of the durations of the alternatives evaluated and the effectiveness of the monitored natural attenuation component of the remedy.

Attached to this Responsiveness Summary are the following Appendices:

Attachment A - Post-Decision Proposed Plan
Attachment B - Public Notice, Proposed Plan summary
Attachment C - Letters Submitted During the Public Comment Period
Attachment D – Transcript of the July 17, 2008 Public Meeting

SUMMARY OF COMMENTS AND EPA'S RESPONSES

The specific comments have been summarized and categorized as follows:

- Remedial Activities Performed to Date
    - MRIP Property Soils
    - Existing Groundwater Extraction and Treatment System
    - High Falls Water District
- Site Characterization
    - Aquifer Characteristics
- Evaluation of Remedial Alternatives
    - Short-term Effectiveness
    - Long-term Effectiveness and Permanence
    - Cost
- Implementation of the Amended Groundwater Remedy
    - Plume Dynamics
    - Monitored Natural Attenuation
- Miscellaneous

A summary of the comments and concerns and EPA responses thereto are provided below:

Remedial Activities Performed to Date

MRIP Property Soils

Comment #1: Why has vapor extraction not been implemented within Areas of Concern (AOCs) A, B, and C?

Response #1: Following the removal of contaminated soil and waste debris from AOCs A, B and C, analytical results for post-excavation soil samples indicated that the action levels called for in the Record of Decision (ROD) were met in soils remaining within the excavations. Therefore, there was no need to extract and treat soil gas from AOCs A, B, and C.

Comment #2: Are there impacts due to the discharge of treated vapor from the Soil Vapor Extraction (SVE) system and/or Vapor Mitigation Systems?

Response #2: Operation of the SVE system extracts vapors from the contaminated subsurface just north of the commercial building at the 186 Mohonk Road property. Volatile organic contaminants (VOCs) including Site contaminants of concern (COCs) within the vapors are removed via contact with activated carbon, prior to release of the treated air to the atmosphere. The vapor entering the system and the air released from the system are monitored routinely, such that the system's carbon is replaced with clean carbon before the existing carbon is no longer able to remove contaminants from the extracted vapors. The contaminated carbon is later cleaned for reuse off-Site, with the contaminants ultimately destroyed.

The vapor mitigation systems within the commercial building operate at low air flow rates and depressurize the area below the building slab. The quality and quantity of this extracted gas is such that it does not require treatment prior to release and subsequent natural dilution and destruction within the atmosphere.

Additionally, during EPA's vapor intrusion investigation within the community, analyses of ambient air (air surrounding the homes) showed no impacts due to the Site COCs.

Existing Groundwater Extraction and Treatment System

Comment #3: Where is the water discharged following treatment?

Response #3: Groundwater extracted via the near field system is, following treatment, discharged into the Coxing Kill Creek.

Comment #4: How is the waste removed from the groundwater ultimately handled?

Response #4: During the period when extracted groundwater is in contact with the activated carbon, contaminants move from the groundwater to the carbon matrix. Most often the carbon is "regenerated" or cleaned off-Site for reuse, through a heat process which removes and destroys the contaminants.

High Falls Water District (HFWD)

Comment #5: Did the design of the High Falls Water District Water Supply System consider potential population and demand changes?

Response #5: The design of the HFWD water supply system took into account the 2000 Census population report as well as the reasonable expected population growth within the HFWD boundaries which were based on areas already impacted as well as threatened areas. There is excess capacity at this point in the drinking water plant. Any future decisions for the expansion of the HFWD service area would be made by the HFWD. EPA will not have any role in any such future decisions.

Comment #6: Should disconnected private wells be allowed to be used as non-potable water supplies?

Response #6: EPA advocated for the wells to be sealed permanently (never to be used), however, the Towns chose not to restrict a person's right to this property use. The resultant compromise is that the public must tie into the newly created High Falls Water District's public water system for their potable water supply source with all private wells categorized (and labeled) as nonpotable.

Town ordinances do not restrict replumbing of the private wells, yet they clearly note that the water supplied by these wells is not suitable for use beyond nonpotable (e.g., car washing, lawn watering) use. The Towns, the High Falls Water District, and EPA do not recommend use of the private wells as a water source of any type. For more information regarding such practices, contact your county health department.

Comment #7: Is the discharge to the canal associated with the flooding concerns on several private properties along Berme Road?

Response #7: At this time, EPA does not believe that the excess water conditions in several backyards along Berme Road are caused by the discharge of backwash water from the HFWD facilities into the canal. However, EPA will further evaluate the situation to identify the cause and address the problem if determined to be attributable to the remedial action.

Comment #8: Why don't the installed fire hydrants drain automatically?

Response #8: The fire hydrants' barrel drain holes are intentionally plugged by design in order to prevent potential backflow of potentially contaminated groundwater into the hydrants. This measure helps preserve the integrity of the drinking water in the water supply lines. This type of fire hydrant was a requirement of and approved by NYSDOH.

Comment #9: What can the public do if property restoration related to waterline installation is considered inadequate?

Response #9: Almost all property restoration concerns to date have been addressed and resolved. Any remaining concerns regarding property restoration associated with connections to the High Falls Water District should be directed to the EPA Remedial Project Manager.

Site Characterization

Aquifer Characteristics

Comment #10: How are the limits of the contaminant plume defined?

Response #10: The limits of the contaminant plume are defined using the criteria first established in the 2000 ROD as well as information gathered as part of the 2008 ROD Amendment. The near field plume was defined as having total VOCs greater than 1,000 parts per billion (ppb). The far field plume was defined as having total VOCs between 5 ppb and 1,000 ppb. Groundwater samples are collected on a regular basis and tested by a laboratory for the complete list of VOCs. These results are then plotted on a map to see if the extent, size, or shape of the contaminant plume has changed.

Comment #11: How confident is EPA that the monitoring wells have defined these boundaries?

Response #11: The contaminant plume boundaries have been well defined over the past eight years of sampling the monitoring wells in the area. Additional monitoring wells have been added over the years where improved definition of the plume was required. There are now more than 25 monitoring wells being sampled to define the plume. The 2008 Final MNA Assessment evaluated monitoring data that indicate groundwater contaminant concentration trends are either decreasing or stable (see Figures 3 and 4), and exhibit the presence of the full range of 1,1,1-trichloroethane (TCA) breakdown products within the far field plume and/or wells bounding the far field plume. As part of the Monitored Natural Attenuation (MNA) remedy for the far field plume, the boundary will be frequently evaluated to see if any changes are evident. While EPA is confident in its definition of the plume boundary, should the plume boundaries change, EPA can re-evaluate the remedy.

Evaluation of Remedial Alternatives

Short-term Effectiveness

Comment #12: Wouldn’t constructing a second extraction plant and increasing groundwater extraction be considered more effective in the short term?

Response #12: The short-term effectiveness criterion examines the effectiveness of alternatives in protecting human health (the community and workers) and the environment during the construction and implementation of a remedy until response objectives have been met. In the case of GW-3 there is no construction, and implementation would include only tasks associated with groundwater monitoring. With GW-2, implementation would be more difficult as there are additional impacts related to the construction and operation of the treatment plant. These impacts would include traffic disruptions and noise, increased energy consumption and waste generation, potential fugitive dust of opening roads and excavations to install additional piping for the far field system on public and private land, and disruptions from transporting construction materials through town.

Long-term Effectiveness and Permanence

Comment #13: What are the expected durations of the alternatives evaluated?

Response #13: Calculating the expected durations of the groundwater alternatives has proven to be difficult at this Site due to the fractured bedrock hydrogeologic conditions. The inherent complexity of the modeling required several assumptions and has led to simplifications in evaluating the remediation timeframe of the alternatives. The groundwater alternative GW-2, which includes continued operation of the near field groundwater extraction and treatment system and construction and operation of a new far field groundwater extraction and treatment system would likely clean up the groundwater plume somewhat faster (in approximately 30 years) than the GW-3 alternative which includes MNA with continued operation of only the near field groundwater extraction and treatment system.

The groundwater modeling conducted in the 1999 NYSDEC Feasibility Study (FS) was performed to estimate cleanup timeframes for a groundwater pump and treat remedy for Sitewide groundwater (both the near field and the far field plumes). That modeling effort resulted in an estimated cleanup timeframe of 27 to 87 years for the source area (near field) groundwater as well as the lower concentration far field plume. The concentrations in the far field plume have decreased since the 1999 modeling was performed due to 1) effective source area groundwater remediation and containment with the current groundwater extraction and treatment system in the near field, and 2) natural attenuation of contaminants in the far field plume. Thus, the estimates for a groundwater pump and treat system for the far field plume would be even less than the estimates in the FS since the concentrations are now lower and contaminated groundwater in the near field plume is no longer a source for the far field plume.

The 2008 Final MNA Assessment estimated that Site groundwater would achieve TCA remediation goals within the far field plume in approximately 44 years for Alternative GW-3. However, it should be noted that these projected time estimates should be considered rough estimates only. Monitoring data was evaluated in the 2008 Final MNA Assessment to produce an estimated aquifer restoration goal for each COC in the groundwater in the vicinity of each monitoring well (see Table 9). The restoration timeframes indicated that the cleanup levels for all of the COCs could be achieved at each of the monitoring wells in as few as 8 years or up to 56 years. In fact, some of these cleanup levels have already been achieved in several locations. The rate constants and the projected times derived from these values possess uncertainties. As noted above, there are also significant uncertainties in the modeling performed in the 1999 Feasibility Study that predicted it would take 27 to 87 years to achieve cleanup levels in the plume. As a result, the timeframes for achieving the cleanup levels throughout the plume under either the MNA approach of alternative GW-3 or the active groundwater extraction and treatment approach of alternative GW-2 cannot be distinguished. Overall EPA believes that alternative GW-3 will provide similar levels of long term effectiveness as alternative GW-2.

Cost

Comment #14: To what extent does cost affect remedy selection?

Response #14: CERCLA requires the analysis of all nine criteria in selection of a remedy for a Site. At this Site, the CERCLA process was followed and is documented in the Post-Decision Proposed Plan and the ROD Amendment. There are two threshold criteria: overall protection of human health and the environment and compliance with applicable or relevant and appropriate requirements. The alternatives were first evaluated based on the threshold criteria prior to the comparative analysis. Then the alternatives which passed the threshold criteria were evaluated using all seven of the other criteria, including cost. In this instance, the additional cost was weighed as a balancing factor with the relative similarity in long term effectiveness of alternatives GW-2 and GW-3.

Implementation of Amended Groundwater Remedy

Plume Dynamics

Comment #15: During groundwater extraction and/or MNA, is the plume reduced, are contaminant concentrations reduced, or both?

Response #15: Whether a groundwater extraction system or MNA was the remedy for the far field plume, the plume size would be reduced and the individual contaminant concentrations would also decrease. A groundwater extraction system could capture an area of the aquifer to reduce the plume size and it could reduce concentrations by extracting contaminants from the groundwater. MNA will decrease the concentrations through natural processes which will also reduce the size of the contaminant plume. Of particular importance is the fact that the plume has been stable. It has not been growing. The active remedial action at the near field groundwater extraction system and MNA are also causing the concentrations at the source and in the far field plume to decrease.

MNA

Comment #16: For how long will the long-term monitoring be performed?

Response #16: Long-term monitoring will be performed until the remedial goals for the Site – achievement of drinking water standards (or Maximum Contaminant Levels (MCLs)) and restoration of the aquifer to its best use (as a source of potable groundwater) – are reached. During the implementation of the remedy, the appropriateness of the monitoring well network with respect to the plume would be evaluated as the plume is further refined, and modifications including the abandonment and/or installation of additional monitoring wells could be made to the well network as necessary to support comprehensive monitoring of the selected remedy.

Comment #17: How is the occurrence of MNA established?

Response #17: The 2008 Final MNA Assessment verified that the Site chemical and geochemical data show definitive evidence for MNA at the Site. The data indicate biological activity supporting reductive dechlorination of TCA and TCE, including:

- o Decreasing contaminant concentrations in the near field plume;
- o Stable and low or non-detectible contaminant concentrations in the far field plume;
- o The full range of TCA breakdown products have been detected in the far field plume and/or the wells bounding it;
- o Presence of reducing conditions bounding the plume in the far field plume; and
- o Presence of reducing conditions in localized areas in both the near and far field plumes.

A Long-term Monitoring (LTM) Plan will be prepared that includes specific monitoring requirements for MNA parameters and subsequent evaluations with respect to MNA. The LTM Plan will include the requirements for the periodic operations, maintenance, and monitoring reports. LTM will also include periodic recording of groundwater elevations, recording of water quality parameters, and collection and analysis of groundwater samples to provide the lines of evidence of degradation of the contaminants and breakdown products and of the progress of remedial activities.

Comment #18: Will long-term monitoring target MNA breakdown products?

Response #18: Although evaluations frequently focus on the Site related COCs, laboratory analyses currently performed and proposed report a list of over 60 volatile organic compounds, including the breakdown products indicative of natural attenuation processes. The evaluation of all compounds potentially associated with the Site (i.e., COCs and breakdown products) and their exposure potential will continue throughout the course of remedy implementation.

Comment #19: Will there be a different remedy available if the measurement criteria are not met?

Response #19: The proposed alternative includes a long-term monitoring component which allows for the ongoing evaluation of Site conditions over the course of remedy implementation. In the event that monitoring data indicates that the remedy is not protective of human health and the environment, options for improving the remedy would be evaluated based on the then-current conditions. This will occur on a formal, comprehensive basis with EPA's 5-Year review process.

Miscellaneous

Comment #20: Are bacterial contaminants in groundwater a concern within the Site area?

Response #20: Fecal coliform was targeted in addition to Site COCs when NYSDEC and EPA analyzed private well water in order to support the design and maintenance of the point-of-entry treatment (POET) systems installed in 1994 as part of early actions at the Site. Where some bacterial contamination was detected, ultra-violet (UV) disinfection systems were installed as part of the POET systems. Septic systems are contributing to deterioration of water quality of the aquifer; however, these types of contaminants are not Site-related COCs. As a result, they are not targeted during sampling currently performed and proposed in association with the Mohonk Road Industrial Plant Superfund Site. For more information regarding water quality analyses, contact the Ulster County Health Department.

Comment #21: Where can NYSDEC and NYSDOH concurrence with the remedy be accessed?

Response #21: The State letter of concurrence is provided within Appendix IV of the ROD Amendment. NYSDOH concurrence is not required under the NCP, but NYSDOH's concurrence is also contained in the State's letter.

Comment #22: Will eventual transfer of the Site to NY State affect remedy implementation?

Response #22: EPA will operate the near field extraction and treatment system for ten years from the date of startup (until September 28, 2011). The near field extraction and treatment system will be turned over to the State on or before that date. The proposed remedy of MNA/Long-term Monitoring would be performed and funded by EPA for ten years from the date of the ROD Amendment. Also, even when the operation and maintenance of the remedy has been turned over to the State, the Site is still a federal Superfund Site. The Site would not be deleted from the National Priorities List (NPL) until groundwater standards are met. There is a formal process for deleting a Site from the NPL which includes public comment. At that time, EPA would again come to the community to explain that the aquifer had been restored and there was no residual contamination remaining on Site prior to Site deletion.

Comment #23: Where can the Site documents be accessed?

Response #23: Project documents are available at EPA Region 2's offices in New York, as well as at the project repository located at the Stone Ridge library. Most project documents are also available at the Rosendale Public Library. Street addresses for these repositories are provided within the Proposed Plan which is Attachment A of this document.

RESPONSIVENESS SUMMARY
Attachment A – Post-Decision Proposed Plan

Superfund Post-Decision Proposed Plan

Mohonk Road Industrial Plant Superfund Site

ULSTER COUNTY, NEW YORK

United States
Environmental Protection
Agency

July 2008

Purpose of Proposed Plan

This Post-Decision Proposed Plan describes the proposed fundamental changes to the March 2000 Record of Decision (ROD) issued by the United States Environmental Protection Agency (EPA) with concurrence by the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) for the Mohonk Road Industrial Plant (MRIP) Site (the Site) located in the towns of Marbletown and Rosendale, Ulster County, New York.

The remedy specified in the ROD required construction and operation of a new public water supply system to supply water to those with impacted or threatened private supply wells, active remediation of contaminated groundwater by extraction and treatment - including continued operation of the groundwater extraction and treatment system installed to address the area around the source (the near-field plume) and installation of a separate extraction and treatment system to address the portion of the groundwater plume downgradient from the source (the far-field plume), additional removal and disposal of contaminated soil, and long-term monitoring of groundwater conditions. EPA has implemented all components of the remedial action specified in the ROD except installation of the far-field plume extraction and treatment system, because EPA no longer believes such an installation is necessary. In this Post-Decision Proposed Plan, EPA is proposing a monitored natural attenuation (MNA) remedy because it will be equally protective of human health and the environment and cost effective.

This Post-Decision Proposed Plan was developed by EPA in consultation with NYSDEC. EPA is issuing this Post-Decision Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended (commonly known as the federal "Superfund" law), and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). EPA encourages the public to review these documents to gain a more comprehensive understanding of the Superfund process.

This Post-Decision Proposed Plan is being provided to inform the public of EPA's preferred remedy and to solicit public comments pertaining to all the remedial alternatives evaluated. The proposed alternative described in this Post-Decision Proposed Plan is the *preferred* alternative for the Site. Changes to the preferred alternative or a change from the preferred alternative to another remedy may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the alternatives considered because EPA may select a remedy other than the preferred remedy.

Mark Your Calendar

July 7, 2008 – August 6, 2008: Public comment period on the Proposed Plan.

July 17, 2008 at 7:00 P.M.: Public meeting at the Fire House, 1 Fire House Road, High Falls, New York.

COMMUNITY ROLE IN SELECTION PROCESS

EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. Similarly, EPA also relies on public input when proposing fundamental changes to a remedy previously selected. To this end, this Post-Decision Proposed Plan and all reports referenced herein have been made available to the public for a public comment period which begins on July 7, 2008 and concludes on August 6, 2008.

Comments received at the public meeting, as well as written comments received during the public comment period, will be documented in the Responsiveness Summary section of the ROD Amendment, the document which formalizes the selection of the remedy.

Written comments on this Proposed Plan should be addressed to:

Sal Badalamenti
Remedial Project Manager
Eastern New York Remediation Section
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866

Telefax: (212) 637-3966
Internet: badalamenti.salvatore@epa.gov.

SITE REPOSITORIES

Copies of the Proposed Plan and supporting documentation are available at the following information repositories and website:

Stone Ridge Library
3700 Main Street, P.O. Box 188
Stone Ridge, NY 12484-0188
(914) 687-7023

Hours:
Monday and Wednesday, 1:30 A.M. - 8:00 P.M.
Tuesday, Thursday, and Saturday 10:00 AM - 5:30 PM
Friday 1:30 PM - 5:30 PM

and

Rosendale Library
264 Main Street, P.O. Box 482
Rosendale NY 12472
This information repository contains many of the Site documents, but not the entire Administrative Record (which is available at the Stone Ridge Library).

and

USEPA Region 2
Superfund Record Center
290 Broadway, 18th Floor
New York, NY 10007-1866
Telephone: (212) 637-3000
www.epa.gov/region2/superfund/npl/mohonkroad

Hours:
Monday - Friday, 9:00 A.M. - 5:00 P.M.

SCOPE AND ROLE OF ACTION

The primary objective of this Proposed Plan is to present an Amendment to the ROD for the Mohonk Road Industrial Plant (MRIP) Superfund Site (Site). The remediation goal of the ROD is to eliminate human exposure to groundwater contaminated by the MRIP Site that does not meet state or federal drinking water standards, restore the groundwater contaminated at the Site to drinking water standards, and prevent the contaminated groundwater from spreading and further impacting the aquifer, and eliminate the potential for human exposure to any contaminants in subsurface soils on the MRIP Property or the release of those contaminants into the groundwater.

Prior to the issuance of the ROD, several interim actions had occurred at the Site, including the installation of a groundwater extraction and treatment system to minimize the further migration in the bedrock aquifer of the most highly contaminated portion of the groundwater plume (conducted as a non-time critical removal action [NTCRA]) closest to the MRIP Property.

EPA has implemented the following elements of the ROD:

- construction and operation of a new public water supply system, providing an alternate water supply to those with impacted or threatened private supply wells;
- removal and disposal of contaminated soils which are a source for groundwater contamination;
- active remediation of contaminated groundwater by the continued operation of the groundwater extraction and treatment system to address the near-field plume at the source, and long-term groundwater monitoring; and
- institutional controls preventing future use of the aquifer within the High Falls water District (HFWD) via Ordinances of the Towns of Marbletown and Rosendale prohibiting establishment or maintenance of a source of drinking or domestic water separate from the public water supply of the HFWD.

The ROD also included a separate groundwater extraction and treatment system to address the portion of the plume which is downgradient from the source (the far-field plume). EPA and NYSDEC now believe that this second extraction and treatment system is no longer necessary. With the construction of the public water supply system, human health risks are controlled. The removal of potential sources, the continued operation and maintenance (O&M) of the existing groundwater extraction and treatment system, and the reduction of contamination within the near-field plume have significantly reduced the migration of contaminants from the Site. Over the last several years, EPA has performed extensive monitoring of the far-field plume and conducted an investigation to evaluate potential vapor intrusion. Evaluations of monitored natural attenuation (MNA) as a remedy for the far-field plume suggest that MNA is a viable alternative to groundwater extraction and treatment within the far-field plume.

EPA has developed this proposed plan to evaluate the following three alternatives for the far-field groundwater remedy for this Site: (1) No Further Action, (2) Groundwater Extraction and Treatment (the remedy selected in the ROD for the far-field plume), and (3) MNA/Long-term Monitoring.

SITE BACKGROUND

Site Description

The MRIP Site is located in the Hamlet of High Falls, Ulster County, New York, approximately seven miles north-northwest of the Village of New Paltz and ten miles south-southwest of the City of Kingston. High Falls is situated within two townships; the Towns of Marbletown and Rosendale (see Figure 1). The Site includes a facility located at 186 Mohonk Road (the MRIP Property), and all surrounding properties that have been impacted by the contaminated groundwater plume. Residents and businesses within the area are now obtaining their potable water from the High Falls Water District, a publicly-operated water supply system.

The MRIP Property originally consisted of approximately 14.5 acres of mostly undeveloped land, with a 43,000-square-foot building in its southern corner. As part of the water supply remedy, consistent with the ROD, 6.9 acres of the northern property were conveyed by the Kithkin Corporation on August 19, 2005 to the High Falls Water District. This northern portion of the property is now the location of the High Falls Water District's drinking water treatment plant.

The Site-related groundwater plume extends approximately 4,000 feet downgradient from the MRIP Property, and had adversely impacted at least 75 residential and commercial water supply wells. The "near-field plume" as historically defined in the ROD refers to that portion of the groundwater plume with total volatile organic compound (VOC) concentrations greater than 1,000 parts per billion (ppb), while the "far-field plume" refers to the component of the groundwater plume between 10 ppb and 1,000 ppb total VOCs. Figure 3 depicts the current extent of the plume boundary to the 5 ppb total VOC concentration. The entire near-field plume is currently within the estimated capture zone of the existing groundwater pumping and treatment system.

CONTAMINANTS of CONCERN (COCs)

As a result of the historic use of solvents and other chemicals at the MRIP Property, Site groundwater contains contaminants known as volatile organic compounds (VOCs). The contaminants of concern (COCs) specifically identified as a result of investigations at this site include the following:

- **trichloroethene (TCE)** - an industrial solvent
- **1,1,1-trichloroethane (TCA)** – an industrial solvent, the contaminant typically found in highest concentrations at the site
- **1,1-dichloroethane (DCA)** – a breakdown product of TCA
- **1,1-dichloroethene (DCE)** – a breakdown product of TCA
- **1,4-dioxane** - a stabilizer associated with TCA

The NYS Maximum Contaminant Level (MCL) for TCE, TCA, DCA, and DCE is 5 ppb, while the MCL for 1,4-dioxane is 50 ppb.

Site Geology/Hydrogeology

Three distinct water bearing zones have been identified at the Site, including an overburden (till) flow zone, a bedrock interface flow zone (at the shallow soil/bedrock interface), and a bedrock flow zone (the bedrock aquifer). The till, which dominates in the vicinity of the Site, is a highly compacted silt and fine-grained sand matrix and does not transmit water readily.

Regional groundwater flow is controlled by the structural geology of the area and is dominated by the orientation of the fractures within the bedrock aquifer. Groundwater flow is primarily to the north-northeast with localized variations to the west and east towards Rondout Creek and Coxing Kill Creek. Downhole geophysical investigations identified water-producing fractures with thin beds of finer-grained material throughout the vertical extent of the bedrock aquifer at depths ranging from approximately 20 to 194 feet below the ground surface (bgs).

Vertical flow gradients on the MRIP Property are clearly downward. However, artesian or upward groundwater flow has been reported in several residential wells and multi-level monitoring wells outside of the MRIP Property.

The MRIP Property is situated near a topographical high that serves as a recharge area for the bedrock aquifer. The remedial investigation (RI) concluded that contamination entered the bedrock groundwater near the former septic tank and spread northward from the MRIP Property in the bedrock aquifer. In the vicinity of the near-field groundwater extraction and treatment system, active pumping of groundwater from the bedrock is resulting in the capture of a significant portion of the groundwater contaminated with VOCs.

Site History

The MRIP Property had been used for industrial purposes since the early 1960s. These activities included metal finishing, wet spray painting, and manufacturing of store display fixtures, card punch machines, and computer frames. Wastes from these operations were typically discharged into a septic tank on the property.

The Site first came to the attention of state and local authorities in April 1994, when a resident near the MRIP Property contacted the Ulster County Health Department (UCHD) regarding the quality of her drinking water. The resident's well was sampled in April 1994 by UCHD, and the sample was found to contain levels of VOCs above federal and/or NYS MCLs for drinking water. Subsequent sampling performed by UCHD identified 70 other homes or businesses downgradient of the Site with VOCs above the aforementioned standards for drinking water. As an interim action to address immediate health threats, NYSDEC installed point-of-entry treatment (POET) systems at homes or businesses whose potable water supply exceeded the NYS MCLs (5 ppb) for the individual VOCs. These systems included particulate filters, granular activated carbon (GAC) for VOC removal, and ultraviolet (UV) oxidation for disinfection. Monitoring of private wells on the perimeter of the plume was instituted to ensure that impacts to previously unaffected private wells downgradient of the Site would be addressed. As a result of the ongoing monitoring program, five additional homes and businesses were ultimately supplied with POET systems. In 1994, NYSDEC placed the Site on the NYS Registry of Inactive Hazardous Waste Sites, indicating that the Site posed a significant threat to public health and the environment.

In the fall of 1996, NYSDEC assessed subsurface conditions within five suspected disposal areas. Investigations included geophysical surveys, soil gas screening, soil borings, and monitoring well installation. Samples of surface soils, subsurface soils, groundwater, soil vapor, and water and sludge samples from within an abandoned 1,000-gallon septic tank located north of the MRIP building, were collected. Two sources of VOC contamination were identified on the MRIP Property, including (1) subsurface soil beneath the gravel driveway at the western end of the MRIP building, and (2) the abandoned septic tank (see Figure 2). Additionally, VOC concentrations above MCLs were detected in groundwater.

Based on this investigation, NYSDEC initiated an RI in 1997 to characterize the nature and extent of groundwater contamination. The RI results indicated that VOC contamination, including PCE, TCE, TCA, DCE, DCA, ethylbenzene, and xylenes, existed in soils at the MRIP Property; the dissolved-phase groundwater VOC plume was found to extend approximately 4000 feet north-northeast from the MRIP Property; and downgradient private water supplies, as well as groundwater in the bedrock aquifer beneath the MRIP Property, exhibited VOC concentrations above EPA Removal Action Levels, federal and NYS MCLs, and NYSDEC Class GA Drinking Water Standards. During the RI, the abandoned septic tank, its contents, and 25 tons of surrounding contaminated soil were excavated and removed from the Site.

Additionally, 1,4-dioxane, a stabilizer associated with TCA, was detected at the MRIP Property at concentrations above the 10 NYCRR Part 5 standard of 50 ppb for “unspecified organic contaminants” (which includes 1,4-dioxane). Sampling of private wells indicated that 1,4-dioxane was present at concentrations ranging from 2 to 96 ppb. NYSDEC provided bottled water for two residences which exceeded only this standard until the 1,4-dioxane levels fell below the 50 ppb level.

The Site was added to the National Priorities List (NPL) on January 19, 1999. NYSDEC released a feasibility study (FS) which evaluated cleanup alternatives for the entire Site in March 1999, and a proposed plan in November 1999. Public comments were accepted from November 15, 1999 through March 15, 2000. EPA assumed the role as lead agency with the issuance of the ROD in March 2000.

The major components of the selected remedy documented in the ROD are:

- construction of a new public water treatment plant and distribution system to serve the proposed water service area in High Falls;
- extraction of groundwater on and off the MRIP Property, with treatment via air stripping and GAC; and
- excavation of approximately 500 cubic yards (CY) of contaminated soils on the MRIP Property and disposal off-Site.

On June 4, 1999, EPA authorized a NTCRA consisting of the construction of the near-field groundwater extraction and treatment system designed to minimize the further migration of the most highly contaminated portion of the groundwater plume within the bedrock aquifer. The groundwater extraction and treatment plant began operating 24 hours a day, seven days a week in May 2000. As of December 2007, over 46.6 million gallons of contaminated groundwater have been extracted and treated via this system.

Additional removal and disposal of contaminated soils was performed based on data collected by NYSDEC during the RI and by EPA during the NTCRA, and as prescribed by the ROD. The four areas shown in Figure 2 were identified as requiring soil cleanup. EPA excavated and disposed of a total of 2,036 tons of contaminated soil, paint waste and debris from these areas.

In addition, COCs were found in soil gas immediately north of the commercial building on the MRIP Property. An 18-well soil vapor extraction (SVE) system was installed in 2007. The SVE system has been fully operational since February 2008.

In February 2005, EPA initiated an investigation to determine if subsurface contamination originating from the MRIP Property may put nearby residents at risk due to vapor intrusion of VOCs into homes. Permanent sub-slab soil gas sampling ports were installed in 34 residential and 9 non-residential locations, with soil gas samples collected and analyzed for VOCs. The sampling determined that the concentrations of VOCs at all residential locations were below the health-based screening levels. Therefore, no further evaluation and/or action were deemed necessary. However, samples obtained in the commercial building on the MRIP Property indicated the need to install a vapor mitigation system. In early 2007, six new sub-slab ventilation systems were installed, with extraction points in the subsurface layer underneath the building’s concrete floor. These mitigation systems are currently operating as designed.

The construction of the water treatment plant and water distribution system called for in the ROD began in the fall of 2005 and was completed in the fall of 2007. The water treatment plant and accompanying water tower occupy approximately seven acres of land in the northern section of the MRIP Property (see Figure 2). The system is connected to the pressurized Catskill Aqueduct, which is part of the New York City reservoir system. Stringent sampling and monitoring is conducted to verify that the treated water meets all federal and NYS drinking water standards. NYSDOH certified the newly constructed High Falls Water Treatment Plant as operational on September 24, 2007. Connection of homes and businesses within the water district to the public water supply was completed in November 2007. The MRIP building at 186 Mohonk Road was also connected to public water supply. Concurrently, POET systems were removed, associated well lines were capped, and well pumps' piping and power were disconnected. An ordinance within the High Falls Water District prohibits residents from establishing or maintaining a source of drinking and domestic water separate from the public water supply, yet allows existing separate water sources to be used for purposes other than drinking and domestic use.

In 2006, an evaluation of the potential for MNA for the far-field plume, based on groundwater monitoring data collected on a semi-annual basis from 1999 through April 2006 was performed. In April 2008, EPA obtained an update to the 2006 MNA assessment. These reports conclude that MNA is a viable remedy for the far-field plume. Monitoring data indicate groundwater contaminant concentration trends are either decreasing or stable (see Figure 4), and exhibit the presence of the full range of TCA breakdown products within the far-field plume and/or wells bounding the far-field plume.

SUMMARY OF GROUNDWATER CONDITIONS

Site investigations have indicated that groundwater in the bedrock aquifer is contaminated with various VOCs, including TCA, TCE, DCE, and DCA, above Federal and NYS MCLs. A plume with a total VOC concentration of at least 5 ppb extends a distance of approximately 4000 feet from the MRIP Property and covers an area of roughly 170 acres. Since the discovery of the Site in 1994, residential wells beyond the perimeter of the plume have been monitored to verify that the water in these wells was suitable for domestic use.

From 1996 to 1998, NYSDEC installed 22 monitoring wells - including two in the overburden (MW-9 and -11), five in shallow soil/bedrock (MW-1 through -5), and thirteen in bedrock (MW-1B, -5B through -15B, and -11C), installed two bedrock extraction wells (MW-5R and -7R), and performed six rounds of groundwater sampling. The RI concluded that contamination entered the bedrock groundwater near the former septic tank and spread northward from the MRIP Property in the bedrock aquifer. The most concentrated portion of the VOC plume was detected in wells near the former septic tank. In November 1996, a groundwater sample from shallow soil/bedrock well MW-4 was found to contain 87,000 ppb of TCA, 10,000 ppb of DCE, 6,700 ppb DCA, and 3,300 ppb of TCE. Subsequent rounds of sampling confirmed levels of these VOCs above MCLs, and although levels decreased significantly after NYSDEC removed the tank in August 1997, the levels of VOCs remained elevated well above MCLs at the time of the ROD. Samples from the nearest downgradient bedrock monitoring well, MW-5B, also contained levels of TCA, DCA, DCE and TCE above MCLs, with the total VOC levels consistently greater than 1,000 ppb during the RI. At the time of the ROD, contaminant levels in MW-5B had not appreciably decreased.

As part of the NTCRA, EPA installed four additional bedrock wells on the MRIP Property (ERT-1 through ERT-4). Sampling results from these wells confirmed VOC concentrations were above MCLs on the MRIP Property, and ERT-4, the well closest to the location of the former septic tank, had the highest VOC total (an estimated total of 7,510 ppb TCA, DCA, DCE and TCE in October 1999).

Monitoring well data indicated that upon release into the overburden, contaminants migrated downward into the bedrock aquifer without significant lateral movement. Monitoring wells located upgradient of the MRIP Property have not been found to contain TCA or other VOCs at concentrations above MCLs.

From 2004 through 2007, 1,4-dioxane has been detected in well ERT-3 on the MRIP Property at concentrations ranging from 30 to 83 ppb. The highest concentration of 1,4-dioxane detected in the far-field monitoring wells has been 18 ppb at MW-17-1, with levels at non-detect or near non-detect (2 ppb) in the far down-gradient wells (Sevenson 2008). Concentrations in residential wells are presently below the 10 NYCRR Part 5 Unspecified Organic Compound standard of 50 ppb. With the present far-field concentrations below the NYSDEC cleanup level and the relatively low near-field concentrations, it is likely that natural attenuation physical processes which were identified in the 2008 MNA evaluation will continue to reduce 1,4-dioxane concentrations in the far-field to below the NYSDEC cleanup level.

Groundwater elevation level measurements have typically been recorded from 15 residential and Site-related monitoring wells every two weeks for the last eight years in order to evaluate regional drawdown due to the groundwater extraction system and to ensure continued water supply to nearby residential wells, avoiding drawing water levels below the intake of the well pumps. Historically, the hydraulic gradient has been impacted by the operation of the near-field groundwater extraction and treatment system and slow groundwater recharge in the area. The completed public water system has resulted in the termination in pumping of private wells in the area of groundwater contamination. Monitoring of water levels continued after the residential wells were disconnected in

November 2007; an updated groundwater contour map is provided as Figure 3. A new monitoring well fitted with several ports to enable groundwater sample collection from different bedrock zones will soon be installed approximately 2000 feet east-northeast of the MRIP Property to assist in evaluating conditions along the eastern edge of the plume.

Historically, the 25 monitoring wells associated with the Site have been sampled every six months in order to track the migration of the contaminant plume. Quarterly O&M reports for the near-field system have included the results of all monitoring well and residential well sampling. Since the disconnection of the residential wells in November 2007, sampling and analyses were performed in December 2007 and April 2008; Table 1 provides the December 2007 analytical results. The extent and concentration levels of the bedrock groundwater contamination are depicted in Figure 3; Figure 4 presents total VOC concentration trends in several source (near-field), mid-plume, and far-field wells. The December 2007 VOC data indicate the limits of the plume are generally defined in all directions (Figure 3). Downgradient residential wells provide no suggestion of increasing trends in any of the contaminants. All wells in the far-field plume with statistically significant trends show decreasing contaminant concentrations. The increased extraction rates of the near-field treatment system and the additional source removal anticipated with the SVE system operation increase the likelihood that the plume margins will shrink in the future.

Groundwater quality monitoring of the Site has been an ongoing biannual effort at most of the 25 monitoring wells in the network since 1999. Sampling and analysis for MNA parameters began at most of the monitoring wells in April 2006 and has continued biannually. In order to obtain sufficient data to complete a full MNA evaluation of the current plume, the monitoring wells have been sampled on a quarterly basis since December 2007 for VOCs and 1,4-dioxane, along with standard field monitored parameters. The most recent monitoring well sampling event was performed in April 2008.

The 2008 MNA evaluation verified that the Site chemical and geochemical data show definitive evidence for biological activity supporting reductive dechlorination of TCA and TCE, including:

- Decreasing contaminant concentrations in the near-field plume;
- Stable and low or non-detectible contaminant concentrations in the far-field plume;
- The full range of TCA breakdown products have been detected in the far-field plume and/or the wells bounding it;
- Presence of reducing conditions bounding the plume in the far-field plume; and
- Presence of reducing conditions in localized areas in both the near- and far-field plumes.

Sampling for VOCs and 1,4-dioxane along with standard field monitored parameters will be continued quarterly. Water level data will continue to be collected and carefully monitored to ensure that analytical samples and natural attenuation data are sufficient to confirm that the near-field plume is under hydraulic control.

SUMMARY OF SITE RISKS

The purpose of the following summary of the risk assessment is to identify potential cancer risks and non-cancer health hazards at the Site assuming that no further remedial action is taken. A risk evaluation was performed to evaluate future health risks associated with exposure to contamination at the Site based on current (2007) Site data.

<u>Human Health Risk Assessment</u>

As part of the 1999 RI/FS, a baseline human health risk assessment (BHHRA) was conducted to estimate the risks associated with the current and future effects of contaminants on human health and the environment. A baseline human health risk assessment is an analysis of the potential adverse human health effects caused by hazardous-substance exposure in the absence of any actions to control or mitigate these under current and future land uses. A four-step human health risk assessment process was used for assessing Site-related cancer risks and non-cancer health hazards. The process includes: Hazard Identification of Chemicals of Potential Concern (COPCs), Exposure Assessment, Toxicity Assessment, and Risk Characterization (see following box “What is Risk and How is it Calculated”).

In the BHHRA conducted as part of the RI, unacceptable cancer risks and non-cancer hazards were identified based on soil contact and potential future use of groundwater as a potable drinking water supply.

EPA recently sampled monitoring wells that are outside of the capture zone of the current groundwater remedy. These wells are in place to monitor levels of contamination that are not being addressed by the current pump-and-treat system and will continue to migrate. These wells have been sampled and the results indicate that Site-related contaminants are in the groundwater above MCLs. In 2008, a new risk evaluation was performed on these contaminants, with a focus on TCE. EPA’s statistical evaluation of the TCE in groundwater, if used as a potable drinking water source for residents in the future, would result in an excess lifetime cancer risk of 3×10^{-5} (3 in one hundred thousand). All non-cancer health hazard estimates are within the acceptable limits. In addition, concentrations of 1,1-DCE, 1,1-DCA, 1,1,1-TCA, and

WHAT IS RISK AND HOW IS IT CALCULATED?

Human Health Risk Assessment

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health hazards, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one in ten thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one in ten thousand to a one in a million excess cancer risk. For non-cancer health effects, a "hazard index" (HI) is calculated. The key concept for a non-cancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as Chemicals of Concern or COCs in the final remedial decision or Record of Decision.

TCE exceeded their respective MCLs in 88% of the samples (21 of 24).

These calculated risks to human health require EPA to evaluate remedial measures to reduce the potential for exposure and risks associated with the observed contamination and restore the groundwater to beneficial use.

In February 2005, EPA initiated an investigation to determine if subsurface contamination originating from the MRIP Property may put residents at risk via vapor intrusion. Permanent sub-slab soil gas sampling ports were installed in 34 residential and 9 non-residential locations, with soil gas samples collected and analyzed for VOCs. The sampling determined that the concentrations of VOCs at all residential locations were below the health-based screening levels. Therefore, no further evaluation and/or action were deemed necessary.

However, samples obtained in the commercial building on the MRIP Property indicated the need to install a vapor mitigation system. In early 2007, six new sub-slab ventilation systems were installed in the subsurface underneath the building's concrete floor. These mitigation systems are currently operating as designed.

Ecological Risk Assessment

The purpose of an ecological risk assessment (ERA) is to provide a baseline evaluation of the nature and geographical extent of possible ecological risks based on current environmental conditions. During the RI, a Fish and Wildlife Impact Assessment performed during the RI identified no threatened or endangered birds, mammals, reptiles, amphibians, fish, or invertebrates within the Site area and no currently existing pathways for significant exposures to fish or wildlife to Site-related contaminants. The study concluded that no further study of fish and wildlife resources was necessary at that time.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals established to protect human health and the environment. RAOs are based on available information and regulatory standards, such as applicable or relevant and appropriate requirements (ARARs), NYSDEC's soil cleanup objectives, Site-specific risk-based levels, and the reasonably anticipated future land use for the MRIP Property, i.e., commercial development.

The RAOs developed during the FS for soil and groundwater were designed, in part, to mitigate the health threats posed by ingestion and inhalation (through showering) of groundwater and contact with soils. The following RAOs were established in the ROD:

- Eliminate inhalation and ingestion of, and dermal contact with, contaminated groundwater associated with the Site that does not meet State or Federal drinking water standards.
- Restore the bedrock aquifer to its most beneficial use (i.e., as a source of potable water), and restore it as a natural resource.
- Prevent or minimize cross-media impacts from COCs in contaminated soil to the underlying groundwater, which will also eliminate potential future exposure to this soil. Site soil cleanup objectives for COCs would be based on NYSDEC's TAGM 4046 for groundwater protection.
- Eliminate further off-MRIP Property contaminated bedrock groundwater migration.

The selected remedy included:

- Continued O&M of POET systems at homes and businesses adversely impacted by the VOC plume until the construction and operation of a new public water supply system provides an alternate water supply;
- Active remediation of contaminated groundwater by the continued operation of the existing extraction and treatment system to address the near-field plume at the source;
- Removal and disposal of additional contaminated soils which were a source for groundwater contamination;
- Installation of a separate extraction and treatment system to address the portion of the far-field plume, and long-term groundwater monitoring; and
- Institutional controls to prevent future use of the bedrock aquifer within the impacted or threatened area (i.e., within the HFWD)

Since the development of the RAOs, approximately 2,567 tons of contaminated soil has been removed from source areas at the MRIP Property; the septic tank, believed to be the primary source of Site contamination, was excavated along with approximately 25 cubic yards (CY) of associated soil in September 1997. These remedial activities meet the intent of the soil RAO described above.

Homes and businesses with impacted water supplies were provided with POET systems until their connection to the newly constructed High Falls Water District public water supply system; local regulations currently mandate connections to this system within the Water District. Additionally, sub-slab vapor mitigation systems have been installed to address vapor intrusion at the MRIP commercial building at the Site. These remedial activities have eliminated the groundwater exposure pathway, and their continuance meets the intent of the associated RAO.

A groundwater extraction and treatment system was installed within the near-field plume, and has been operating 24 hours a day since May 2000. Groundwater monitoring in the vicinity of the former septic tank has shown reductions of total VOC concentrations, and Site-wide groundwater monitoring has shown groundwater quality has improved over the last several years. The continued control and remediation of groundwater via the operation of the groundwater extraction and treatment system at the MRIP Property is reducing off-MRIP Property migration within the near-field plume.

Current contaminant trends and water quality parameters indicate that MNA, in conjunction with the currently active remedies, are expected to be adequate in remediating the far-field plume without a far-field pump and treat system. In addition, recent increases in the extraction rates for the near-field groundwater extraction and treatment system also provides support for MNA as an effective remedial approach for the far-field plume. As a result, EPA has decided to reevaluate the active groundwater extraction and treatment remedy for the far-field plume specified in the ROD, leading to this Post-Decision Proposed Plan.

Since it remains a part of the overall remedy for groundwater, the continued operation of the existing groundwater treatment system will be included under each of the remedial alternatives evaluated herein. Accordingly, the RAOs established for this evaluation are the following:

- Restore the bedrock aquifer to its most beneficial use (i.e., as a source of potable water), and restore it as a natural resource.
- Eliminate further off-MRIP Property contaminated bedrock groundwater migration.

SUMMARY OF REMEDIAL ALTERNATIVES FOR FAR-FIELD GROUNDWATER

CERCLA requires that each selected site remedy be protective of human health and the environment, be cost effective, comply with ARARs, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The alternatives for addressing groundwater contamination are provided below and are identified as GW-1, GW-2, and GW-3. Consistent with EPA guidance documents concerning ROD Amendments, the components of the original remedy proposed for amendment have been updated for cost and are compared to a new preferred alternative which was developed based upon existing Site circumstances. For all alternatives, the near-field pumping and treatment system will continue to operate. Additionally, each alternative assumes that compliance with local regulations requiring property owners within the High Falls Water District to receive their domestic water supply from the High Falls Water Supply System will continue to be employed, preventing future use of the bedrock aquifer in the impacted or threatened area. The groundwater remedial alternatives are:

Alternative GW-1: No Further Action

The Superfund program requires that the "No Further Action" alternative be considered as a baseline for comparison with the other alternatives.

Under this alternative, EPA would take no further action within the far-field plume to prevent migration of or exposure to groundwater contamination. While the operation of the current near-field groundwater extraction and treatment system would be continued, the groundwater monitoring program would be discontinued. As a result, EPA would be unable to determine if contaminants were migrating within groundwater or from groundwater to surface water or the extent to which natural attenuation was occurring. EPA would also be unable to assess source contaminant elimination beyond the evaluation of information inherent in operating the existing system.

Capital Cost	$0
O & M Cost	$375,360 near-field system O&M
Present Worth Cost	$4.7 million
Construction Time	Not Applicable
Duration	Not Applicable

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years.

Alternative GW-2: Groundwater Extraction and Treatment / Long Term Monitoring

Under this alternative, the far-field component of the groundwater remedy established in the ROD would be implemented, specifically the installation of a second groundwater extraction and treatment system off the MRIP Property. The system's design would be similar to the existing groundwater extraction and treatment system, and would include a long-term monitoring component. The continued operation of the existing groundwater extraction and treatment system would control and remediate groundwater in the vicinity of the MRIP Property. This remedy would result in achievement of an unlimited use and unrestricted exposure scenario. Achievement of this result would require longer than five years. In accordance with CERCLA, a remedy review would be conducted at least every five years until such time that the Site allows for unlimited use and unrestricted exposure.

Cleanup levels would be based on Federal and NYS MCLs. The extraction wells would be designed to operate at an optimal rate to collect contaminated groundwater, intercept the contaminant plume, and prevent any potential migration downgradient. For the purposes of conceptually identifying the number of wells, pumping rates, and well locations, the same assumptions made in the ROD (based on groundwater modeling performed during the FS) were assumed, specifically three wells pumping at a rate of 40 gallons per minute (gpm) each for approximately 30 years, to effectively capture the contaminants in the interior of the plume. Optimal design parameters and a more refined estimate of the time required to remediate the aquifer would be developed during the remedial design phase.

Contaminated groundwater would be pumped from the extraction wells to an air stripper for VOC removal. Pretreatment of the groundwater would be necessary to remove conventional contaminants such as iron and manganese (which may foul treatment plant equipment) and in order to meet surface water discharge limits. For cost estimating purposes, it was assumed that treated groundwater for the new groundwater treatment plant would be discharged to the Rondout Creek via a gravity discharge line. Effluent criteria would be based on State regulatory standards under the State Pollutant Discharge Elimination System (SPDES) program and obtained from NYSDEC. The treatment process would produce precipitate, which would be thickened and disposed of off-Site periodically following pre-disposal characterization; for cost estimating purposes, it was assumed that this precipitate would be disposed of as non-hazardous waste at a local landfill.

Capital Cost	$5.44 million
O & M Cost (annual)	$375,360 near-field system O&M $375,360 far-field system O&M $241,088/yr LTM years 1-5 $222,240/yr LTM years 6-10 $164,096/yr LTM years 11-30
Present Worth Cost	$17.4 million
Construction Time	12 months
Duration	30 years

Long-term groundwater monitoring (as described for GW-3) would be conducted during the active remediation phase to assess the effectiveness of the groundwater extraction and treatment system. Periodic evaluations of the groundwater monitoring data would be used to evaluate the continued operation of the groundwater extraction and treatment systems. During the implementation of the remedy, the appropriateness of the monitoring well network with respect to the plume would be assessed as the plume is further refined. Potential modifications to the network would include the abandonment and/or installation of monitoring wells as necessary to support the selected remedy. In addition, periodic monitoring of the sub-slab ventilation system within the MRIP building would be performed to evaluate the effectiveness of the system. This evaluation would be conducted during the annual groundwater monitoring event, at a minimum.

Alternative GW-3: MNA/Long-Term Monitoring

Under this alternative, VOCs within the far-field plume would be allowed to attenuate via naturally occurring processes within and along the perimeter of the far-field plume. The continued operation of the existing groundwater extraction and treatment system would control and remediate groundwater in the vicinity of the MRIP Property. A long-term groundwater monitoring and data evaluation program would be implemented to monitor the groundwater contaminant concentrations and reduction of VOC concentrations over time and to confirm that the remedy remains protective. Cleanup levels would be based on Federal and NYS MCLs; these levels are estimated to be achieved in approximately 30 years. In addition, periodic monitoring of the sub-slab ventilation system within the MRIP building would be performed to evaluate the effectiveness of the system. This evaluation would be conducted during the annual groundwater monitoring event, at a minimum.

Capital Cost	$12,720
O & M Cost (annual)	$375,360 near-field system O&M $241,088/yr LTM years 1-5 $222,240/yr LTM years 6-10 $164,096/yr LTM years 11-30
Present Worth Cost	$7.23 million
Construction Time	Not Applicable
Duration	30 years

Long-term monitoring would include periodic recording of groundwater elevations, recording of water quality parameters, and collection and analysis of groundwater samples to provide an indication of the movement of the contaminants or of the progress of remedial activities. Quarterly monitoring would include wells representative of background conditions, horizontal and vertical plume boundaries, and the center of the plume, and include sentinel wells along the established perimeter. The annual monitoring event would include additional wells in the monitoring well network to refine contaminant distribution within the plume and to confirm conditions beyond the plume boundary.

Table 1 presents the monitoring wells expected to be initially included in the long-term monitoring well network. During the implementation of the remedy, the appropriateness of the monitoring well network with respect to the plume will continually be evaluated as the plume is further refined. Potential modifications to the network would include the abandonment and/or installation of monitoring wells as necessary to support the selected remedy. Under this alternative, additional monitoring wells would be installed, as necessary, to allow for comprehensive monitoring of the contamination.

This remedy would result in achievement of an unlimited use and unrestricted exposure scenario. Achievement of this result would require longer than five years. In accordance with CERCLA, a remedy review would be conducted at least every five years until such time that the Site allows for unlimited use and unrestricted exposure.

WHAT IS MONITORED NATURAL ATTENUATION?

Natural attenuation relies on natural processes to clean up or *attenuate* pollution in soil and groundwater. Natural attenuation occurs at most polluted sites. However, the right conditions must exist underground to clean sites properly. If not, cleanup will not be quick enough or complete enough. Scientists *monitor* or test these conditions to make sure natural attenuation is working. This is called *monitored natural attenuation* or MNA.

HOW DOES IT WORK?

When the environment is polluted with chemicals, nature can work in four ways to clean it up:

1. Tiny bugs or *microbes* that live in soil and groundwater use some chemicals for food. When they completely digest the chemicals, they can change them into water and harmless gases. (*A Citizen's Guide to Bioremediation* [EPA 542-F-01-001] describes how microbes work.)
2. Chemicals can stick or *sorb* to soil, which holds them in place. This does not clean up the chemicals, but it can keep them from polluting groundwater and leaving the site.
3. As pollution moves through soil and groundwater, it can mix with clean water. This reduces or *dilutes* the pollution.
4. Some chemicals, like oil and solvents, can *evaporate*, which means they change from liquids to gases within the soil. If these gases escape to the air at the ground surface, sunlight may destroy them.

IS IT SAFE?

MNA can be a safe process if used properly. No one has to dig up the pollution, and nothing has to be added to the land or water to clean it up. But MNA is not a "do nothing" way to clean up sites. Regular monitoring is needed to make sure pollution doesn't leave the site. This ensures that people and the environment are protected during cleanup.

EVALUATION OF ALTERNATIVES

In selecting a remedy for a site, EPA considers the factors set forth in CERCLA §121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 CFR

§300.430(e)(9) and OSWER Directive 9355.3-01. The detailed analysis consists of an assessment of the individual alternatives against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

- Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
- Compliance with applicable or relevant and appropriate requirements addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and regulations or provide grounds for invoking a waiver.
- Long-term effectiveness and permanence refer to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.
- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.
- Short-Term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.
- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- Cost includes estimated capital and O&M costs, and net present-worth costs.
- State acceptance indicates whether, based on its review of the Proposed Plan, the State concurs with, opposes, or has no comment on the preferred remedy at the present time.
- Community acceptance will be assessed in the ROD Amendment, and refers to the public's general response to the alternatives described in the Proposed Plan.

Comparative Analysis of Alternatives

Overall Protection of Human Health and the Environment

GW-1 would not be protective because the future and present use scenarios which assume that the Site groundwater is utilized as a potable water supply present unacceptable carcinogenic risks. The Site groundwater is not currently being used as a source of drinking water within the water district, but is used currently and will be in the future beyond the Water District. Alternatives GW-2 and GW-3 would be protective of human health and the environment, as contaminant migration beyond the boundaries of the Water District would be restricted by natural attenuation or active treatment. GW-1 would not be protective of human health and the environment and/or achieve ARARs, since it would be unknown if Site contaminants would naturally attenuate or impact downgradient areas in the absence of the long-term groundwater monitoring program. Alternative GW-1 will therefore be eliminated from further discussion within the Comparative Analysis of Alternatives.

Compliance with ARARs

For GW-2 and GW-3, ARARs set forth in the ROD would be achieved over time. Compliance with ARARs would be demonstrated through the long-term monitoring program.

Long-Term Effectiveness and Permanence

Alternative GW-3 is expected, over the same time period, to provide the same level of long-term effectiveness and permanence as Alternative GW-2. Groundwater modeling conducted during the 1999 FS predicted a groundwater restoration timeframe of approximately 30 years for Alternative GW-2. For Alternative GW-3, monitoring data was evaluated in the MNA Report to produce an estimated aquifer restoration goal for each COC in the groundwater in the vicinity of each monitoring well. The restoration timeframe at each of the monitoring wells ranged from a low of 0.5 years to a high of 56 years, with the average of all COCs at all near-field and far-field locations at less than 30 years. Overall, given the similar average estimated restoration timeframes for both alternatives, EPA believes that Alternative GW-3 would provide similar levels of long-term effectiveness and permanence as Alternative GW-2. The effectiveness of Alternatives GW-2 and GW-3 would be assessed through routine groundwater monitoring and five-year reviews. O&M of the near-field pump-and-treat system under Alternative GW-2 would provide an additional means to monitor removal of contaminants.

Reduction in Toxicity, Mobility or Volume

Alternative GW-3 would reduce the toxicity, mobility and volume of contaminated groundwater through treatment, with additional reduction of toxicity and volume within the far-field plume due to natural mechanisms. Alternative GW-2 would reduce the toxicity, mobility, and volume of contaminated groundwater through treatment to a greater extent than GW-3.

Short-Term Effectiveness
Alternative GW-3 presents virtually no short-term impacts to human health and the environment since no construction is involved. The construction activities required to implement Alternative GW-2 would potentially result in greater short-term exposure to contaminants by workers who would come into contact with the treatment system; however, proper health and safety precautions would minimize this occurrence. While efforts would be made to minimize the impacts, some disturbances would result from disruption of traffic, excavation activities on public and private land, noise, and fugitive dust emissions. The technologies included under Alternative GW-2 and under Alternative GW-3 are proven and reliable.

Implementability
Alternatives GW-2 and GW-3 are available and can be implemented. Alternative GW-3 does not involve any significant construction and, consequently, is much easier to implement. Alternative GW-3 only requires a monitoring program utilizing monitoring wells and the continued O&M of the operational system. Alternative GW-2 would be much more complex since it would also involve construction and piping installation in the short-term and long-term O&M of an additional treatment system.

Cost
Estimated capital, annual O&M (including monitoring), and present-worth costs for each of the alternatives are presented in the Cost Comparison Table.

Cost Comparison Table		
Alternative	GW-2	GW-3
Capital Cost	$5.44 million	$12,720
Annual Costs		
Systems O&M		
near-field system	$375,360	$375,360
far-field system	$375,360	$0
Long-term Monitoring		
years 0-5	$241,088	$241,088
years 6-10	$222,240	$222,240
years 11-25	$164,096	$164,096
Present Worth Cost	$17.4 million	$7.23 million

According to the capital cost, O&M cost and present worth cost estimates, GW-3 has the lowest cost.

State Acceptance
NYSDEC and NYSDOH concur with the preferred remedy.

Community Acceptance
Community acceptance of the preferred remedy will be assessed in the ROD Amendment following review of the public comments received on this Post-Decision Proposed Plan.

PREFERRED ALTERNATIVE
Based upon an evaluation of the various alternatives, EPA recommends Alternative GW-3, MNA/Long-Term Monitoring, as the preferred alternative. Alternative GW-3 provides the best balance of trade-offs among the three alternatives with respect to the evaluation criteria. EPA believes that the preferred alternative will be protective of human health and the environment, will comply with ARARs, and will be cost-effective.

REFERENCES
EPA. 2000. Record of Decision, MRIP, EPA ID: NYD986950012, OU1, High Falls, New York. March 31.

Sevenson Environmental Services, Inc. 2008. Quarterly O&M Report, July to September 2007, MRIP Superfund Site. January 15.

USACE. 2008. Final MNA Assessment, MRIP Superfund Site. April 11.

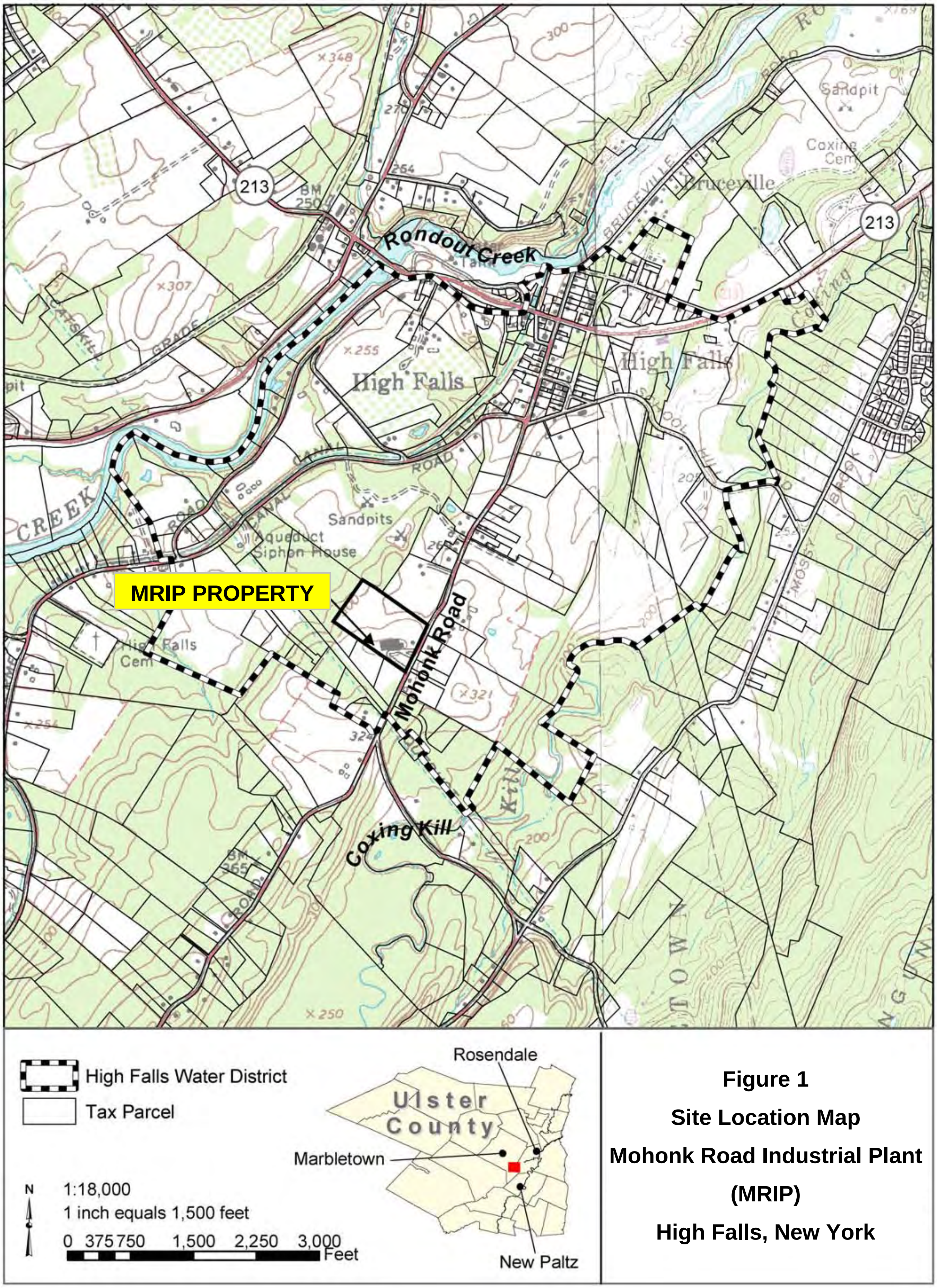
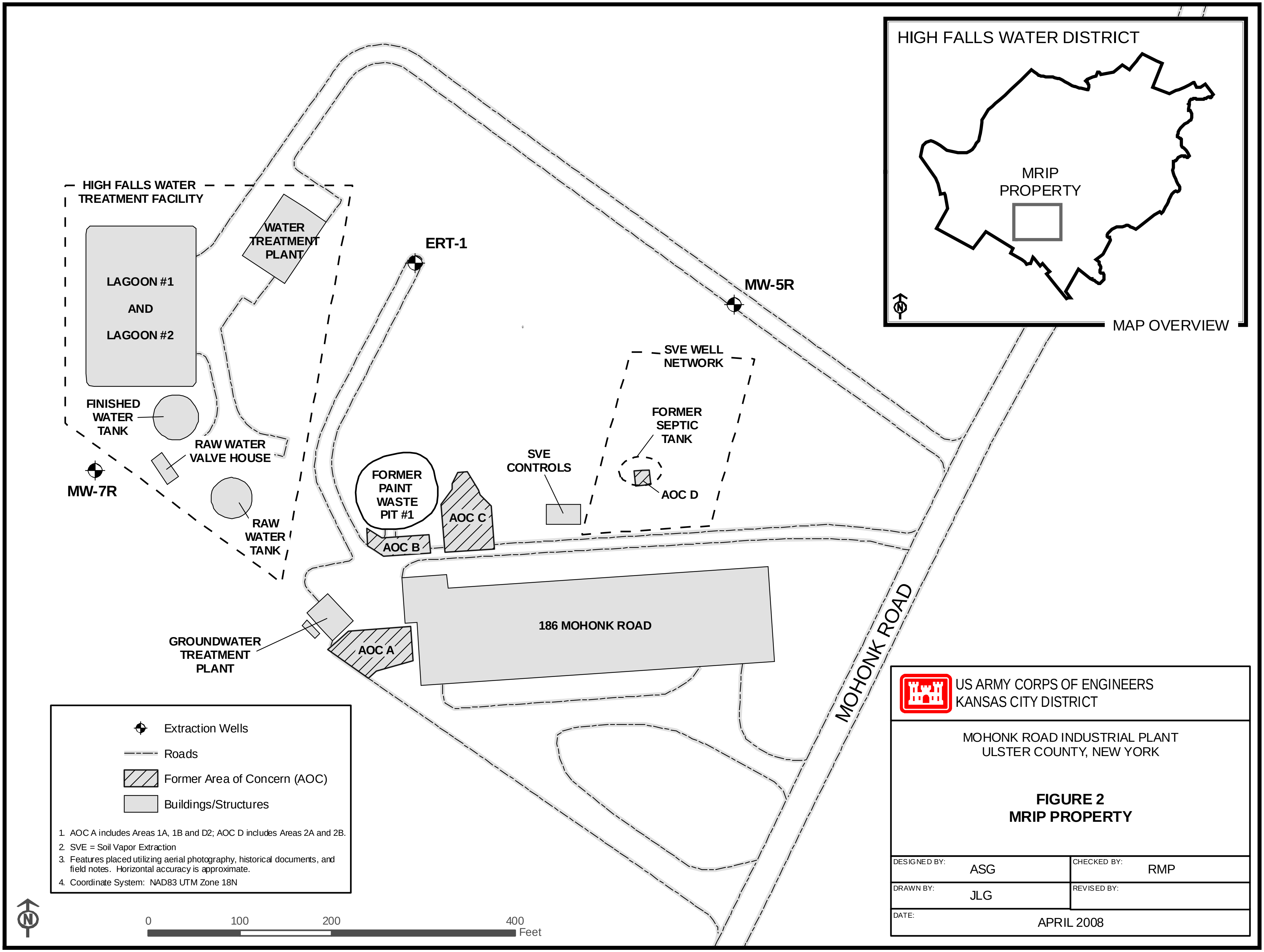


Figure 1

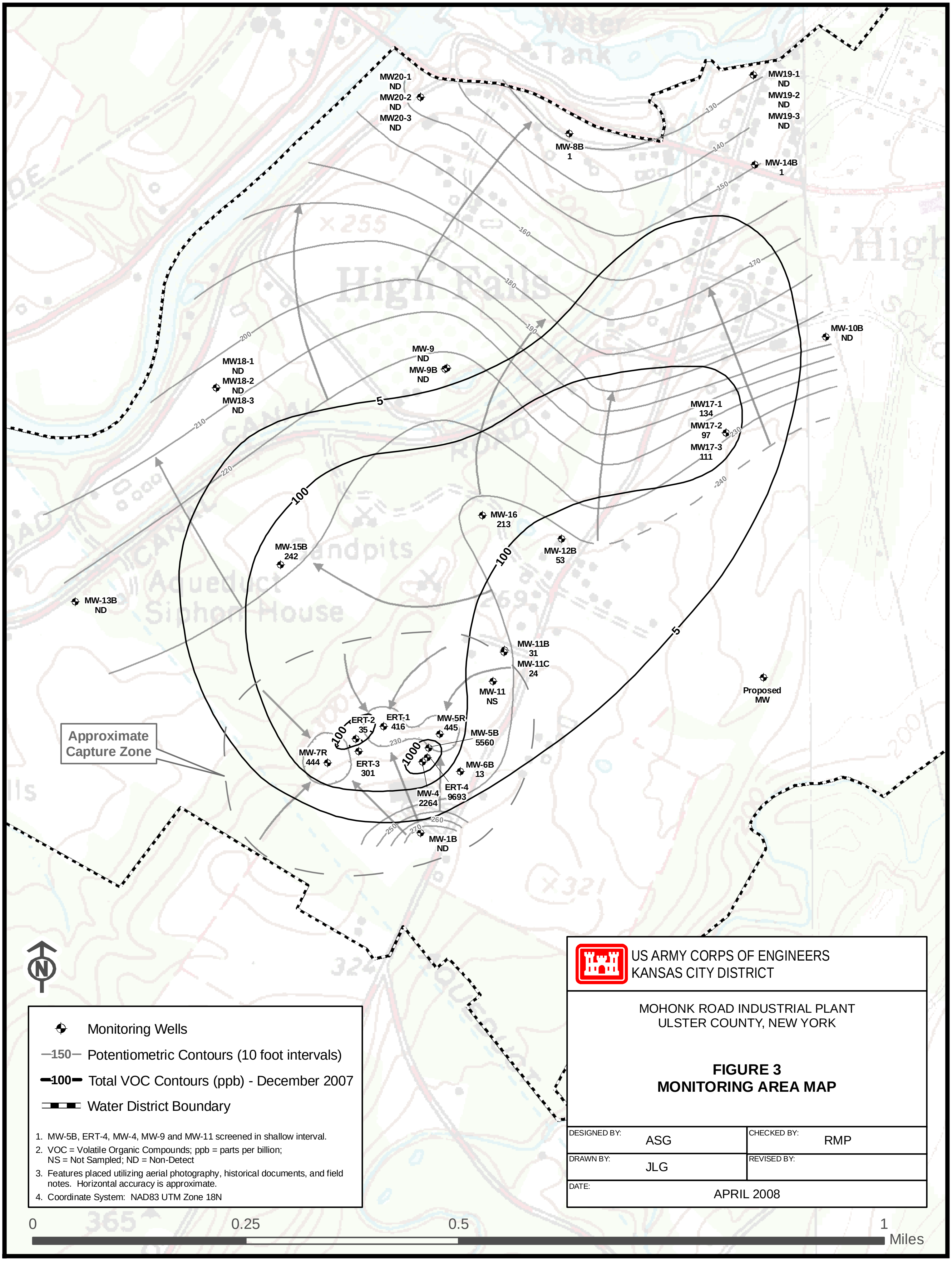
Site Location Map

Mohonk Road Industrial Plant (MRIP)

High Falls, New York

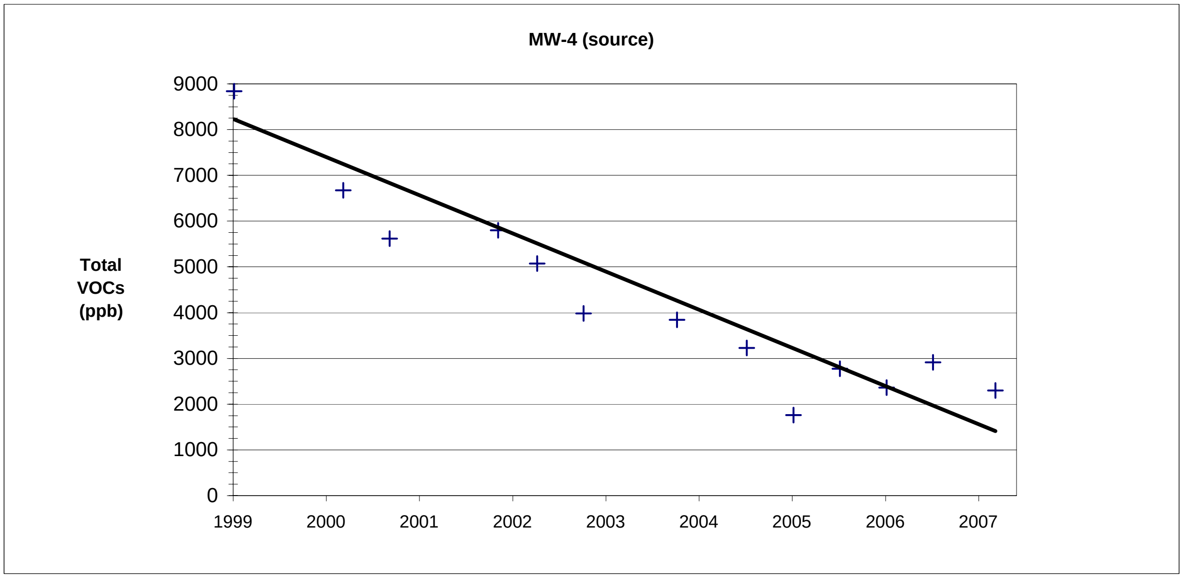


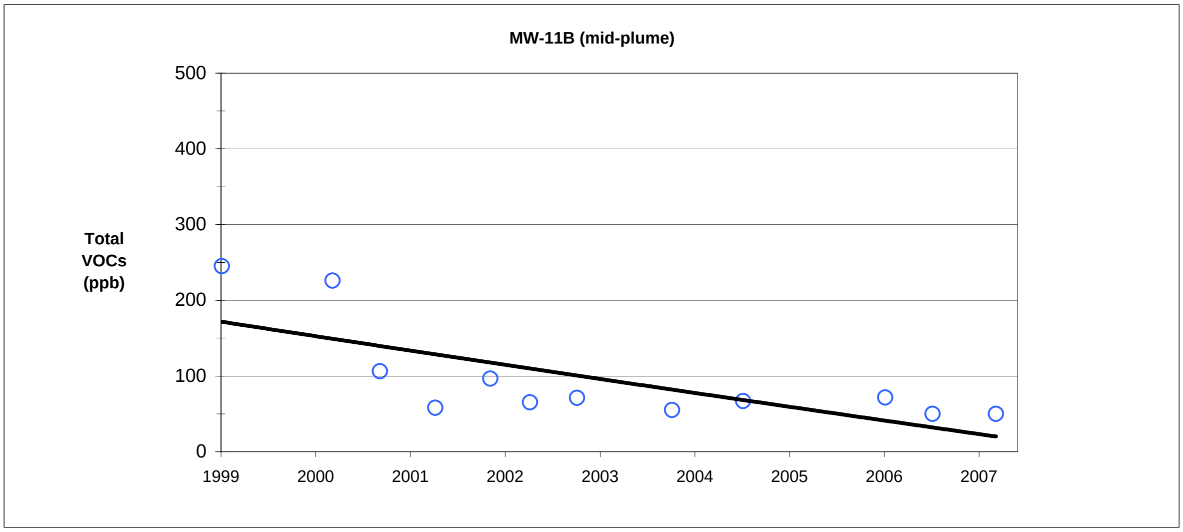
K:\MissionProjects\htw\mrip\GIS\arcgismaps\ProposedPlan_2008\FIG2_Treatment8x11BW_28APR08.mxd



K:\MissionProjects\htw\mrip\GIS\arcgismaps\ProposedPlan_2008\FIG3_TVOC8x11BW_10JUN08.mxd

Figure 4
Total VOC Concentration Trends
Mohonk Road Industrial Plant Site





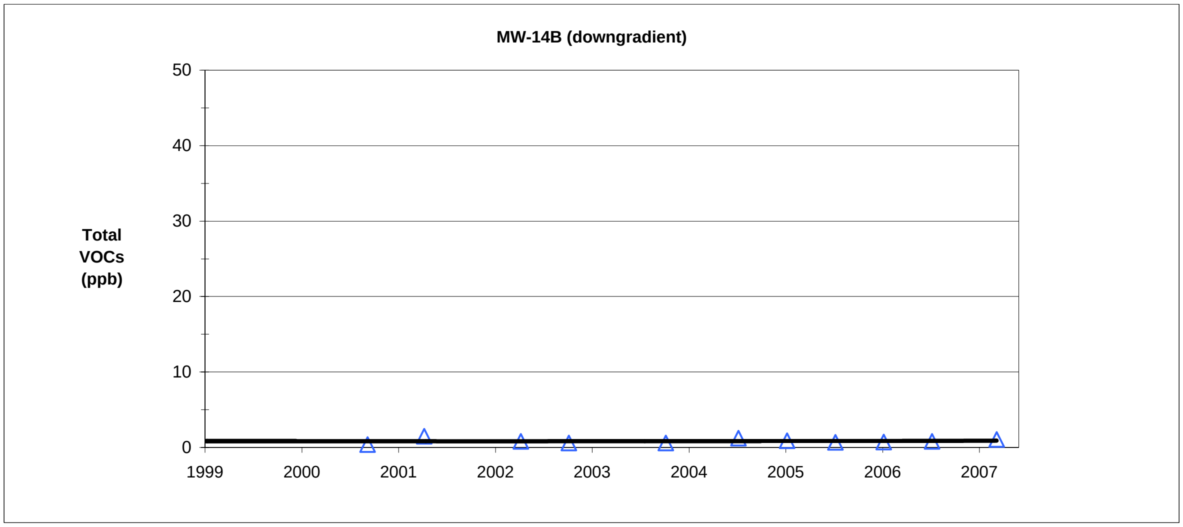


Table 1
Proposed Long-term Monitoring Well Network
Mohonk Road Industrial Plant
High Falls, New York

Monitoring Well	Analytical Results for COCs[1]					Projected Long-term Monitoring Frequency[2]		
	1,1-DCE (µg/L)	1,1-DCA (µg/L)	1,1,1-TCA (µg/L)	TCE (µg/L)	1,4-Dioxane (µg/L)	yrs 0 - 5	yrs 6 - 10	yrs 11 - 30
MCLs	5	5	5	5	50			
Perimeter Wells / Non-Detects								
MW-8B	0.22J	0.37J	0.5U	0.5U	2U	Qtr	NS	NS
MW-9	0.5U	0.5U	0.5U	0.5U	NA	C[4]	C[4]	C[4]
MW-9B	0.5U	0.5U	0.48J	0.5U	2.1U	Qtr	Qtr	Ann
MW-10B	0.5U	0.5U	0.5U	0.5U	2.1U	Qtr	Qtr	Ann
MW-13B[3]	0.5U	0.5U	0.5U	0.5U	2.1U	Qtr	Ann	Ann
MW-14B	0.3J	0.76	0.5U	0.5U	2.1U	Qtr	Qtr	Ann
MW-18-1	0.5U	0.32J	0.5U	0.5U	2.1U	Qtr	Qtr	Ann
MW-18-2	0.5U	0.5U	0.5U	0.5U	2U	Qtr	Qtr	Ann
MW-18-3	0.5U	0.3J	0.5U	0.5U	2.1U	Qtr	Qtr	Ann
MW-19-1	0.5U	0.5U	0.5U	0.5U	2U	Ann	Ann	Ann
MW-19-2	0.5U	0.5U	0.5U	0.5U	2.1U	Ann	Ann	Ann
MW-19-3	0.5U	0.5U	0.5U	0.5U	2.1U	Ann	Ann	Ann
MW-20-1	0.5U	0.5U	0.5U	0.5U	2U	Ann	NS	NS
MW-20-2	0.5U	0.5U	0.5U	0.5U	2.1U	Ann	NS	NS
MW-20-3	0.5U	0.5U	0.5U	0.5U	2U	A	NS	NS
New Well (to-be-installed)[6]								
interval-1	NS	NS	NS	NS	NS	Qtr	Qtr	Ann
interval-2	NS	NS	NS	NS	NS	Qtr	Qtr	Ann
interval-3	NS	NS	NS	NS	NS	Qtr	Qtr	Ann
Plume Wells								
ERT-2	5	2.4	25	1.9	2.2U	Ann	Ann	Ann
ERT-3	32	18	210	39	7.6	Ann	Ann	Ann
MW-11	NS	NS	NS	NS	NS	C[4]	C[4]	C[4]
MW-11B	19J	8.3	19	3.5	2U	Qtr	Ann	Ann
MW-11C	8.2	2	12	1.7	2.1U	Qtr	Ann	Ann
MW-12B	15	6.2	26	4.3	2.1U	Qtr	Qtr	Qtr
MW-15B	43	25	170	3.5	4	Qtr	Qtr	Qtr
MW-16	53	11	140	8.8	5.1J	Qtr	Qtr	Qtr
MW-17-1	37	12	77	6.4	4.3	Qtr	Qtr	Qtr
MW-17-2	26	15	49	5.3	4.8	Qtr	Qtr	Qtr
MW-17-3	30	16	56	0.55	4.7	Qtr	Qtr	Qtr
MW-6B	1.5	0.33J	11	0.5U	2.1U	Qtr	Qtr	Qtr
MW-7B	NS	NS	NS	NS	NS	C[6]	C[6]	C[6]
Former Septic Tank Area Wells								
ERT-4	850	110J	8400	300	4.7	Qtr	Qtr	Qtr
MW-4	160	47J	1100	990	3.3	Ann	Ann	Ann
MW-5B	560	15	4600	380	4	Ann	Ann	Ann
Extraction Wells								
ERT-1	32	49	330	2.1	2.1U	Qtr	Qtr	Qtr
MW-5R	36	55	350	2.1	2.1U	Qtr	Qtr	Qtr
MW-7R	37	52	350	2	2	Qtr	Qtr	Qtr
Background Wells								
MW-1B	0.5U	0.5U	0.5U	0.5U	2U	Qtr	Qtr	Qtr

Notes:
1. Environmental samples collected December 14, 2007.
2. Frequency of collection of environmental samples and water quality parameters may be altered in response to significant changes in data throughout the course of the program.
3. Artesian well.
4. Sampling not currently projected at this existing network well.
5. MW-1, -2, -3, -5, and -6, formerly part of the historic monitoring network, have since been replaced, removed, abandoned, or destroyed.
6. This well will be installed in the near future and is not considered a component of the alternatives evaluated in this Post-Decision Proposed Plan.

Abbreviations:

1,1-DCA	1,1-dichloroethane	J	estimated value	Semi	semi-annually (2 times/year)
1,1-DCE	1,1-dichloroethene	MCL	Maximum Contaminant Levels	TCE	trichloroethene
1,1,1-TCA	1,1,1-trichloroethane	NA	not available	U	not detected above the reported value
Ann	annually (1 time/year)	NR	not recorded		
C	contingent sampling only	NS	not sampled	µg/L	micrograms per liter
COCs	Contaminants of Concern	Qtr	quarterly (4 times/year)	yrs	years
ft amsl	feet above mean sea level				

RESPONSIVENESS SUMMARY
Attachment B – Public Notice, Proposed Plan Summary

EPA Proposes Changes to Cleanup Plan for the Mohonk Road Industrial Plant Site

In 2000, the U.S. Environmental Protection Agency (EPA) selected a cleanup plan for the Mohonk Road Industrial Plant site in Ulster County, NY. EPA has completed all components of the 2000 cleanup plan, including construction of a new public water supply system and removal of contaminated soils, with the exception of installation of a groundwater extraction and treatment system to address the portion of the groundwater plume beyond the Site Property ("far-field"). EPA installed a groundwater extraction and cleanup system to address the contaminant plume at the Site Property but no longer believes that installation of the "far-field plume" extraction and treatment system is necessary to protect human health and the environment. Through a Post-Decision Proposed Plan, EPA is proposing the monitored natural attenuation remedy. EPA invites you to attend a public meeting to discuss the proposed change to the cleanup plan that was selected in 2000, as well as the other alternatives considered. The public meeting will be held on:

Thursday, July 17, 2008
at
7:00 P.M
in the
High Falls Fire House on Fire House Road
Town of Marbletown, New York

EPA is taking written comments on the Mohonk Road Industrial Plant Site from July 7, 2008 through August 6, 2008. The Post-Decision Proposed Plan and other site documents are available at the Stone Ridge or Rosendale Public Libraries. The Proposed Plan is also available for review on-line at www.epa.gov/region2/superfund/npl/mohonkroad.

If you have any questions, please contact David Kluesner, EPA's community involvement coordinator, at 212-637-3653 or tollfree at 800-346-5009.

RESPONSIVENESS SUMMARY
Attachment C - Letters Submitted During the Public Comment Period

From: gamoone@aol.com
Sent: 07/16/2008 11:46 AM
To: Dave Kluesner/R2/USEPA/US@EPA
Subject: Mohonk Road Concerns

I received the notice regarding the meeting for the Mohonk Road Superfund Site Cleanup. I will be unable to attend the meeting due to a teaching assignment out of the area.

However, I would appreciate if you would address an ongoing concern of the residents of the Berme Road section of the new water district. Our yards and basements continue to be flooded since the operation of the water district. We have attempted to work with Terry and Sal to address these matters, with only limited success.

Currently the water district is flushing water on a daily basis into the canal. This in turn is flooding our yards, creating stagnant pools of water which are rapidly becoming mosquito breeding grounds, as well as preventing maintenance of the land. Additionally trees which flourished in theses yards are showing signs of stress, and begining to die off.

Your attention to this matter and the ongoing concern of the citizens of the Water District would be greatly appreciated. You may contact me at this e-mail address. I am in regular contact with the adjoining neighbors, and will be glad to share your responses with them.

Thank you,
Grace Moone
Homeowner High Falls Water District

From: "Michael Stiller" michael@michaelstiller.com
Sent: 07/22/2008 08:53 AM
To: Salvatore Badalamenti/R2/USEPA/US@EPA
Subject: High Falls Water

Hello Sal,

Thanks again for your time and all the information you brought to the recent meeting at the High Falls firehouse.

I just wanted to follow up with you and reiterate that Jennifer and I would be very interested in learning more about how the EPA came to the conclusion that erecting a second pump and treat plant would have no effect on the speed of the VOC abatement in the High Falls ground water.

We're also curious to know which factors have changed since the first ROD was published to make the EPA want to omit this element of the original plan. As I mentioned in the meeting, we'd also like to know if the two models you described were mutually exclusive as to their components or if the model that included the second treatment plant, showing no increased benefit over the process of MNA, was created with consideration for this natural process which would occur in any case.

Thanks for your attention to these concerns.

Best Regards,
Michael Stiller
Principal Designer
Michael Stiller Design
116 School Hill Road
High Falls, NY 12440
voice: 212-473-2629
fax: 215-935-1897
www.michaelstiller.com

RESPONSIVENESS SUMMARY

Attachment D - Transcript of the July 17, 2008 Public Meeting

----

MOHONK ROAD INDUSTRIAL PLANT

SUPERFUND SITE

PROPOSED CHANGE TO CLEANUP PLAN

High Falls, Ulster County, New York

Public Meeting

7:00 p.m.
July 17, 2008
1 Firehouse Rd
High Falls, New York

PRESENT:

DAVID KLUESNER, EPA
Community Involvement Coordinator

SAL BADALAMENTI, EPA
Project Manager

ANGELA CARPENTER, EPA

MICHAEL SIVAK, EPA

AMY DARPINIAN, USACE
Project Chemist

DREW SMITH, USACE

misidentification; the correct affiliation is
New York State Department of Health

FAY S. NAVRATIL
~~Ulster County Department of Health~~

Reported by: KAREN SCHMIEDER, CSR, RDR

MOHONK ROAD SUPERFUND SITE

MR. KLUESNER: We are going to get started. It's a little after 7:00.

Welcome. My name is David Kluesner; I'm with EPA, our Public Affairs Office out of Manhattan.

I want to thank you all for coming out tonight. We have about 20 or so minutes of presentation tonight, and then we'll turn it over to questions and answers. Really, that's why we are here.

We are proposing a change in the cleanup plan that we selected in 2000. We've been here a number of times since, prior to the cleanup plan being selected and then afterwards. And it really is a joy to come here each and every time to have these meetings and talk with you. It is a very informed community and a very great community to work with.

MOHONK ROAD SUPERFUND SITE

We are proposing a change in the plan, and we have a lot of folks here that can help answer the questions and explain what we are proposing.

We are also in the middle of a public comment period that runs through August 6th. And then EPA will evaluate those comments, prepare what we call a Responsiveness Summary and include that in our final cleanup plan decision as a result of your input that you provide us tonight and as a result of any written comments that we receive during the comment period.

So we are here tonight to share with you, sort of elaborate on what we provided in the fact sheet. There was a proposed plan that's available on the Internet, and we also have hard copies in the back of the room. To the extent you have

MOHONK ROAD SUPERFUND SITE

questions and want further clarification on what we are proposing to do or any other types of questions about the various work that you've probably seen going on in this community over the past year -- and a lot has been done with the High Falls Water District and the whole construction project. So I think we are really quite far down the road in terms of the overall cleanup of this site. But we want to come back and periodically come back and hear your questions and concerns and try to help answer those questions.

So first I want to introduce Karen Schmieder. She's a stenographer, and she's recording the results of this meeting tonight. It is a requirement by law that when we issue what we call a proposed plan or proposed change in the cleanup plan

MOHONK ROAD SUPERFUND SITE

that we transcribe the results of the meeting. And also this helps us capture the questions and comments that you have so that we can prepare an adequate Responsiveness Summary to those before we actually select a cleanup plan. So after the presentation, if you have questions and comments, I'll just ask that you state your name, and I might ask for you to speak a little bit louder, so Karen can accurately capture your questions and comments.

I will turned it over to Sal Badalamenti who will introduce the rest of the folks here from the Corps tonight.

Thank you, Sal.

MR. BADALAMENTI: All right. I am Sal Badalamenti, the Project Manager on the project. I've been here many years, and I'm familiar with many of you. We also have Angela Carpenter; she's the Chief of the southern New York section. Drew Smith with the Corps of Engineers, he oversaw the construction of the drinking water plant and oversaw the activities of the contractor on a day-to-day basis. He was essentially our eyes and ears.

Bill Bennett from New York State DEC. He's the New York State project manager. Fay Navratil, she's with the New York State Department of Health.

We have Michael Sivak, who is the Risk Assessor on this project. He carefully assessed the risks and looked at the chemical data.

And we have Amy Darpinian here with the Corps of Engineers, and she's been on the project longer than I have. And she's familiar with all

the chemical data and has helped manage our database of all the testing that's gone on over the years. When somebody would give me a call, I lost my results, Sal, I know you tested my well three times, do you have the results. Well, I went to Amy, and Amy got us those results.

Who am I missing? Anybody else? Terry Johnson, with the High Falls Water District. We have worked together a long time. And he's the superintendent of the facility.

So with that, we are here tonight because in 2000 we had a Record of Decision, and we selected a remedy for the site. We have done a lot since the year 2000. It goes beyond the drinking water plant. The 2000 law required construction and operation of a new public water supply system, which as of November '07 has

been completed. Everybody has been hooked up.

In addition, we excavated contaminated soils around the site. That was early on in 2000, which were the original source of the problem, around a septic tank where materials were dumped. The septic tank leaked. The septic tank was removed, and surrounding soils were also excavated and hauled off-site.

We have constructed a groundwater treatment system, and that has been operating since 2000, 24 hours a day. We had been operating that at a lesser rate than we were wishing to, because whenever we started increasing the pumping rates, we started affecting residential wells. So once all the residential wells were disconnected in last November, we have now increased the

pumping rates on it and are removing a lot more chemicals from the ground since that time.

We have been conducting a long-term monitoring program where we have been testing wells, testing how far the plume has gotten, the plume of contamination, and what's been changing along with that. And there were institutional controls implemented which require everybody within the water district to obtain their potable drinking water from the water district. So that was as a result of some ordinances passed by both the towns of Rosendale and Marbletown.

The last thing that was required was a separate groundwater pumping and treatment system that would address portions of the plume that were further away from the source

MOHONK ROAD SUPERFUND SITE

of the problem. Tonight's discussion is primarily focused on that and why it has not been built and why we no longer believe it needs to be built.

In addition to that work that was required by the Record of Decision, we did conduct a vapor intrusion investigation to many homes in the area. I think we tested approximately 38 homes, as well as nine commercial and other building establishments to see if any vapors were evaporating from the ground and coming into people's homes. And I am glad to say that for all 38 homes that were tested, there was not any vapors below the homes, and as a result of that we felt that there was no need to look further, because we were not going to find a problem.

We theorized that the reason why that was occurring is that there

MOHONK ROAD SUPERFUND SITE

is a purged water layer of clean water above the contamination zone, and that is blocking vapors from coming up into the homes.

We did find a problem up at the commercial building where the problem had originated from, and as a result of that we did install a vapor mitigation system in the commercial building. We have six systems, and that has corrected the problem up there for the most part.

As I mentioned earlier, we have increased the pumping rate at the groundwater pumping treatment plant, which is accelerating the cleanup.

I have some photographs of some of this. This is a layout of the entire area. This is the commercial building. This is the new drinking water plant that's been constructed. This is our groundwater pump and treat

MOHONK ROAD SUPERFUND SITE

plant which is extracting groundwater from three extraction wells. [Pointing] one here, one here and that one. These areas here, areas of concern A, B, C and D, are where we excavated soils and removed almost 2,000 cubic yards of soil and displaced them and relocated them off-site.

In this area here, this is where the original septic tank causing the problem originated. We have now installed in this area a vapor extraction system to also help extract vapors in the ground, above the groundwater. Hopefully that will also accelerate the source removal and make the groundwater problem go away sooner.

This is some of the excavation of soils. This was some of the paint sludges that we found way

MOHONK ROAD SUPERFUND SITE

back in 2000. This is the groundwater pump and treat building. This is the interior of that building. These are air strippers. We have a vapor phased carbon system to absorb anything that's extracted from the water there. And then we have another polishing system with activated carbon for the aqueous phase, which is not depicted here.

This is the soil vapor extraction system. This is a vacuum system here. These are carbon units. And these are the extraction wells that we have installed. There are 18 wells up there that are doing a good job extracting additional vapors.

MR. PAT MC DONOUGH: Hey, Sal, can I ask a question? I'm Pat McDonough, Supervisor in the Town of Rosendale.

I am just curious about the

Page 14

MOHONK ROAD SUPERFUND SITE
vapor extraction. You did a fairly
large area where the original septic
tank was and doing work there. Was it
not necessary to do those A, B and C
areas that you identified?
MR. BADALAMENTI:
Specifically right on those areas?
MR. MC DONOUGH: Or around
them like you did around D.
MR. BADALAMENTI: Well, we
did encompass the area where the
original septic tank was, and we
think, based upon the groundwater
monitoring, some of the source still
remains. The other areas further
away --
MR. MC DONOUGH: It wasn't
necessary, there was no vapor?
MR. BADALAMENTI: Correct.
MR. MC DONOUGH: Okay.
MR. BADALAMENTI: These are
the vapor extraction systems we put on

Page 15

MOHONK ROAD SUPERFUND SITE
the commercial building. It's pipe
that goes under the slab, sucks vapors
out. And this is the fan, exhausts
them outside the building.
Of course, some of you have
taken a tour of this. This is the
drinking water plant that was
constructed. And this is the finished
water tank, and the treatment of the
drinking water is in this building.
That's a photo of one of the filter
tanks inside the drinking water plant
showing drinking water.
So all items from the 2000
ROD, as I just depicted, have been
completed except this far-field
groundwater system. We have been
monitoring the groundwater for over
eight years, and we are seeing a lot
of trends. Levels are dropping in
many of the areas. So we conducted an
evaluation of the data to determine

Page 16

MOHONK ROAD SUPERFUND SITE
whether or not monitored natural
attenuation might be an appropriate
remedy as opposed to building a second
groundwater treatment system. And
that evaluation was completed, and I'm
going to let Amy discuss that
evaluation.
MS. DARPINIAN: Since
monitored natural attenuation isn't a
term that you hear all the time, I'm
first going to give kind of a general
description of what it is and how we
identify it; the factors that we look
for to see if it is even occurring at
a site. And then I'll apply it
directly to the Mohonk site so you can
hopefully see some of the evidence and
concur with our agreement.
The phrase monitored natural
attenuation, MNA, refers to natural
processes that clean up and attenuate
the pollution found in soil and

Page 17

MOHONK ROAD SUPERFUND SITE
groundwater. The right conditions
need to exist underground to clean a
site up properly. When we say
properly, it has to be fast enough. I
don't think anyone here wants the site
to be dirty forever, so it needs to be
fast enough, and it needs to be
complete enough. We need to have the
compounds break down enough so they
are not forming anything harmful but
in fact are going all the way to
unharmful compounds. The monitored
part of that is that scientists
monitor or sample the groundwater to
ensure that monitored natural
attenuation is actually working. So
that's where the monitored natural
attenuation phrase comes from. MNA
does work best where the source of the
pollution has been removed.
We have a document available
on the back table that if you end up

having any other questions about how we evaluate monitored natural attenuation, it is called the Citizens Guide, and it is an EPA document. I would invite you to pick one up, if you haven't yet. Pick one up on your way out.

What that document discusses is the various ways that nature can work to help clean up the environment. The first is that natural bacteria are always present in the soil and groundwater, and some of them are capable of actually using chemical pollution as their source of food. And when they eat the chemical contaminants, they are able to digest the chemicals and change them into water and harmless gases. Another form or way that natural processes occur is that chemicals can stick or sorb to soil which holds them in

place. Now, this won't clean up the chemicals, but it will keep them from moving off the site. As pollution, low levels of pollution can move with the groundwater, it will mix up with clean water, and that's called dilution. So that will reduce the concentration of the chemical that's found in the groundwater. And finally, some chemicals, like oils and solvents -- and solvents are a main issue at this project site -- can evaporate. So they will change from a liquid into a gas within the soil. If the gases escape to the air at the ground surface, the sunlight can destroy them.

We talked about how if the source is removed, the natural processes will be more effective at getting rid of that small amount of pollution that remains in the soil and

groundwater. You heard Sal discuss about the fact that we did a lot of soil excavation. We have been pumping the groundwater for eight years now. We have installed a soil vapor extraction system. We have a vapor mitigation system installed at the Mohonk Arts Building. Those are all ways that address the main source of the contamination.

The other part of MNA is the soil and groundwater, In this case the groundwater site, have to be sampled regularly to make sure they are being cleaned up.

So on my last general slide, MNA is a safe process if you monitor it properly. It is not a "do nothing" way to clean up sites. I know this for a fact, because my sampling crew started work on Monday, and they are working the next two weeks collecting

samples from the monitoring wells we have throughout your town. They are taking those samples to ensure that we know where the groundwater contamination is, and that it is not going to spread out of the High Falls Water District. It is actually very intensive. We have to collect the samples; send them to a laboratory; get the data back; put it in the database that Sal mentioned. Then look at that data, plot it out on maps -- I'll be showing you one in a little bit -- to evaluate where the contamination is at this point in time. When we do that it helps assure that the people and environment are protected during the cleanup phase.

MNA will always include reporting the results. At this project site all of our data has always been available and is still available at

MOHONK ROAD SUPERFUND SITE

the repository or any time someone calls and asks for it.

Sal mentioned we did a groundwater evaluation of the site data that we had for the last eight years. That report was called the Final Monitored Natural Attenuation Assessment. It is about 200 pages long with a lot of graphs in it. It is a highly technical document that identified trends and looked at different areas of evidence for whether monitored natural attenuation was occurring; were there any natural processes helping to keep the contamination low. It also looked to say, if we implemented MNA, would it be protective of the folks that live in this community and your environment. That report is available in the repository. If you are interested, that's where you would

MOHONK ROAD SUPERFUND SITE

find it.

We mentioned there are four different natural processes that we evaluated when we did the groundwater evaluation in that report. The first one is are there any natural bacteria that live in the soil and groundwater that could be eating our site solvents up that are present. The compounds in the blue boxes, those were our main solvents that we found during the source area. That's trichloroethene, or TCE, and 1,1,1-trichloroethane 1,1,1-TCA. Those were apparent compounds found at very high concentrations when the project started. We have been able to watch those compounds in the groundwater and they degrade or are broken down by the natural bacteria to form what we call daughter products. To be honest, I'm not sure where daughter products came

MOHONK ROAD SUPERFUND SITE

from. But we are able to detect the daughter products from these original compounds. The 1,1-DCA, chloroethane, going all the way to the gas ethane. And dichloroethene degrades to vinyl chloride, which degrades to ethene, another gas. Those gases that are formed, even will break down farther. We just don't analyze for them. They degrade down to carbon dioxide, so we don't see those compounds present.

We have been able to identify of the four processes, this one is definitely happening at your site to break down the compounds that are in the groundwater.

This is a really busy map, so bear with me as I talk through it. And I have a lot of notes I want to talk about. I know you can't read it. This map is in the MNA assessment report in full color.

MOHONK ROAD SUPERFUND SITE

This line down here goes around the site, is the High Falls Water District. I kind of zoomed in on it, because otherwise the map would have been less legible than it is right here. But all the folks within the High Falls Water District have their drinking water supplied by the drinking water plant.

Another thing I wanted to show you is this is Rondout Creek right down there. Our groundwater in your town flows where these gray arrows are going. So it doesn't take a rocket scientist to figure out that your groundwater flows downhill towards the creek.

Another thing that the map shows us is these orange lines are the lines depicting the concentration of total volatile organic compounds that are in the groundwater. So not

MOHONK ROAD SUPERFUND SITE

just -- we looked at all of the available site contaminants and their breakdown products that have cleanup levels, added up all those numbers and we posted out where are the highest concentrations found. And this little circle there that's right next to the Mohonk Arts Building is our area with the highest contamination. It is over a 1,000 parts per billion, and it has been since I started this project. Although I'll show you an interesting slide in just a little bit. That area has never gone outside. It is not ever been any bigger than that. We do expect it to continue getting smaller. There's also a 100 part per billion line, which is a much larger area. And finally the 5 part per billion line. The 5 part per billion line is the cleanup levels for all of our compounds at the site is 5 parts per

MOHONK ROAD SUPERFUND SITE

billion. That 5 part per billion line has never gone past Route 213. So we have always monitored these wells on the other side of Route 213, and we have never detected our compounds.

There is one more important thing on this map. That's this dotted line circling here. That's our capture zone. The groundwater treatment plant that we have up at the site is sucking on that groundwater, pulling it through, cleaning it up. And it is influencing this large of an area. We have been able, since we increased the flows at the plant, actually that capture zone -- it didn't used to be that big, that's a good thing. We are actually impacting more of the groundwater and able to pull it in and clean it up.

So what I wanted to say quickly about this map --

MOHONK ROAD SUPERFUND SITE

WOMAN IN AUDIENCE: Can I position myself on the map? I see 213, over on the right.

MS. DARPINIAN: This is Mohonk Road and there is 213. We are at the firehouse, which I think is probably right about there. This is Berm Road. Let's see.

MAN IN AUDIENCE: School Hill Road.

MS. DARPINIAN: Thank you. The residents I'm sure know it better than I do.

WOMAN IN AUDIENCE: So that's the limitation of the contamination on the right-hand side?

MS. DARPINIAN: On this side over here.

WOMAN IN AUDIENCE: Yes, what's the street name? How far does it go?

MS. DARPINIAN: Oh, I'm not

MOHONK ROAD SUPERFUND SITE

in the right area yet.

WOMAN IN AUDIENCE: I'm just wondering where the boundaries are.

MR. BADALAMENTI: There are really no streets in that area. That's close to your home I take it.

MS. DARPINIAN: Is this School Hill?

MAN IN AUDIENCE: Yes.

MS. DARPINIAN: Because we have sampled a couple of residential wells.

WOMAN IN AUDIENCE: I'm just wondering how far it goes. I'm not concerned about myself, because I know there is nothing.

MR. BADALAMENTI: We think the eastern boundary of the contamination is where the orange line is.

WOMAN IN AUDIENCE: Right, right. But that doesn't tell me what

MOHONK ROAD SUPERFUND SITE
it means in terms of the village. If there are no roads, then I guess -- how about on the left? Are there any roads that we could identify on the left?
MS. DARPINIAN: This is Canal Road.
WOMAN IN AUDIENCE: Okay.
MAN IN AUDIENCE: It looks like it is as far as the rescue squad on the east side, maybe a little farther. Is that right?
MR. BADALAMENTI: That's an approximate location.
MR. MC DONOUGH: Yeah, that's about right. You can see the triangle.
MS. DARPINIAN: This triangle.
MR. BADALAMENTI: I think that's Fourth Street.
MR. MC DONOUGH: Yeah, yeah,

MOHONK ROAD SUPERFUND SITE
that's where the rescue squad is, right by there.
MS. DARPINIAN: Now, as a reminder, everyone in the water district has been connected to the drinking water plant as of last November. Before that time everyone was tested, and if they had chemicals in their drinking water, we installed granulated activated carbon in the homes and businesses throughout the area. Those have all been removed since everybody is connected to drinking water.
I know you all can't read this, but we used to have a lot of homes in here that we sampled that helped us define this eastern line. And we don't sample homes now since you're on the drinking water. So we are going to need to install an additional well that's labeled as

MOHONK ROAD SUPERFUND SITE
proposed well, and that well installation is going to start next week. Then we'll be able to feel a little bit more confident as we move forward with the monitored natural attenuation at the site. It's a busy map.
Yes.
MR. MC DONOUGH: Can I ask another question?
MS. DARPINIAN: Go ahead.
MR. MC DONOUGH: As you're doing the remediation or as the water is cleaning itself and you're monitoring it, does the plume get smaller, or does the concentration of the solvents in the water get less, or both?
MS. DARPINIAN: We completely expect it to be both. The reason the plume would get smaller is because we are actively pumping the

MOHONK ROAD SUPERFUND SITE
groundwater. But the concentrations that -- you know, this is our capture zone, so if it's farther away than that -- if there is groundwater contamination down here, we are not going to pull it back to that groundwater treatment plant. And in that case we will be depending on these other natural processes to break down and decrease the concentration.
MR. BADALAMENTI: The important part is that it has been stable. It has not been growing. And the concentrations at the source are shrinking.
MR. MC DONOUGH: You guys are pretty clear with the test wells you have around it that the plume hasn't gone out any farther? We have --
MR. BADALAMENTI: We are very confident. We're a little

concerned that there is a little gap on the eastern edge, and that's why we are installing that additional monitoring well there.

MR. MC DONOUGH: Not that you think the plume has expanded there. Just that you don't know because you don't have a well there, a test well there, right?

MS. DARPINIAN: Right.

MR. BADALAMENTI: Right.

MS. DARPINIAN: And that's actually a requirement of monitored natural attenuation. You have to be able to define where is the plume. And we can't just draw that line up this year and never go back again and assume it is still going to be okay and be safe.

Did you have a question?

MAN IN AUDIENCE: To follow up. So the line on the right, the

eastern line is a little bit of extrapolation because you don't have a well there?

MS. DARPINIAN: It is extrapolated from the homeowner wells we used to sample there. Wanda Nicholson and a couple of other homes that had units previously. So we actually do feel pretty confident. Because every time we plot this map it looks just the same.

MR. KLUESNER: Just as a reminder, if you have a question or comment, please identify yourself for our stenographer.

MS. DARPINIAN: We were going to hold questions until the end.

This is just one graph that's out of that monitored natural attenuation evaluation report that I mentioned. And there MW-4 is a source well. It is smack in the middle of

that soil vapor extraction system at the arts building. It is by far one of our hottest wells and always had the highest concentration.

This graph shows when it was started being sampled back in 1999, during remedial investigation. And it had concentrations exceeding 8,000 parts per billion. While you can't draw -- I drew a straight line, but I shouldn't draw a straight line for data that is wiggling. The most recent data there is clearly below 3,000. So even in our source area, we are having an impact. And again, we fully expect because now we can pump the groundwater even harder and we have installed the soil vapor extraction system, the source left in the groundwater will continue to degrade because we are actively treating it.

Some ongoing actions that MNA will require is continue to monitor and analyze the data carefully to ensure that we have a good understanding of where the plume is. We'll need to prepare a long-term monitoring plan. Right now the plan that we were using for the last eight years -- and it's not a monitored natural attenuation plan. So we will need to write a new plan about how often we will sample the wells and what we'll analyze them for and how we'll report them.

Then lastly, a requirement of any remedy that leaves contamination -- I'm not sure I'm going to get all the words right, Sal. If a remedy leaves contamination in place for longer than five years, EPA has to do a five-year review. So that will be a requirement of this site.

MOHONK ROAD SUPERFUND SITE

MR. BADALAMENTI: So with that, we came up with three alternatives. One is required to be evaluated under Superfund, and that's no further action. GW-2 would be the groundwater extraction and treatment and long-term monitoring which was proposed in the original Record of Decision in 2000. And the third alternative is MNA with long-term monitoring. Evolved organics within the far-field plume would naturally attenuate via naturally occurring processes.

There are nine criteria that we are required to evaluate each of these alternatives. First is overall protection of human health and the environment. That addresses whether or not the remedy will provide adequate protection. And compliance with applicable or relevant and

MOHONK ROAD SUPERFUND SITE

appropriate requirements, addresses whether the remedy would address and meet all regulations, appropriate requirements and regulations, federal and state environmental statutes. And the third one is long-term effectiveness and permanence, and that refers to the ability to maintain reliable protection of human health in the environment all the time.

For those three criteria, we believe that groundwater GW-2 and GW-3 are very equivalent. For reduction of toxicity, mobility or volume through treatment, we judge that GW-2 is a little better than GW-3, because that involves two treatment systems as well as the MNA that would occur.

With regard to short-term effectiveness, which addresses the period of time needed to achieve protection and any adverse impacts on

MOHONK ROAD SUPERFUND SITE

human health and the environment, that includes construction and implementation in a period until cleanup goals are achieved, we feel groundwater option 3 is the better alternative.

With regard to implementability, which discussions the difficulty of implementing the remedy, since GW-2 would require construction of a treatment plant and discharge lines as to where that has to be discharged to, again GW-3 is the more easily implementable project alternative, because it only requires monitoring to occur.

With regard to cost, GW-3 is a lot less money than GW-2.

With regard to state acceptance, one of the last criteria, the state, DEC and DOH concur with EPA that MNA is a viable alternative for

MOHONK ROAD SUPERFUND SITE

this site.

And the last one, community acceptance, we will assess, based upon your concerns tonight and what's raised tonight, and we'll respond to that in the Responsiveness Summary.

So with that, EPA is recommending GW-3, which is the monitored natural attenuation with long-term monitoring. And if there are any questions or comments, we'd certainly like to hear them.

MS. JENNIFER STILLER: I'm Jennifer Stiller. I don't understand why you would have assessed the short-term effectiveness would be higher under G-3? I would think that constructing a second extraction plant and extracting more of the groundwater and treating more of the groundwater would be more effective in the short term, and that the MNA in fact would be a method that would take longer to remove the pollutants.

MR. BADALAMENTI: Short-term effectiveness also addresses the impacts, the short-term impacts during construction. And since a treatment plant would have to be constructed with GW-2, that is less -- those impacts are higher than GW-2, which would not require those impacts.

MS. STILLER: Okay, but those impacts are not going to negatively affect the pollutants. That's the impact of having to construct the second --

MR. BADALAMENTI: Yes, that's correct.

MS. DARPINIAN: Which includes -- when we do construction it includes the extra energy to build and run the plant and the cost of transporting things here through your

town, ripping up town roads to lay additional pipes. So that's all a part of that construction and effectiveness.

MR. BADALAMENTI: Yes, sir.

MR. ROY CARLIN: Roy Carlin. I'm not within the district. I guess I'm about a mile out from it.

The word attenuation to me -- and I'm not trained in this area -- the word attenuation really means dilute or spread. And I understand how you're taking contaminants out of the earth, and I understand how water goes down hill. Does that mean that it is only going towards the Rondout now with respect to the water in the aquifer? Doesn't the aquifer spread beyond this particular area?

And then I have a related question to the vapor part.

MR. BADALAMENTI: It does, the aquifer does go beyond the water district.

MR. CARLIN: So couldn't the contaminants while you're attenuating them or spreading them or diluting them go west as well as east and north I guess?

MR. BADALAMENTI: Well, based upon eight years of monitoring, we feel pretty confident that that is the extent of the plume as depicted on that map.

MR. CARLIN: But if you're diluting it, you're spreading it.

MR. BADALAMENTI: Well, yeah, but that's from the source down to the furthest extent of the plume that we have depicted.

MR. CARLIN: All right, what about vapor; now vapor doesn't only go downhill. It goes all over the place.

MR. BADALAMENTI: Yes.

MR. CARLIN: So I suppose when you're de-vaporizing or vaporizing it now -- and I'm not being critical of this; I'm very positive in what you've done. But the vapor is going all around the community to the rest of us who are outside of the district, do we need to test and what kind of tests should we do? I'm not asking you to pay for it either. I'm just trying to figure out how to protect the rest of us.

MS. CARPENTER: Do you want me to answer that?

MR. BADALAMENTI: Sure.

MS. CARPENTER: I'm Angela Carpenter.

The soil vapor extraction unit that is operating up at Mohonk Arts Building, the vapors that are collected in that are actually treated

MOHONK ROAD SUPERFUND SITE
to a certain extent.
We also during the vapor intrusion investigation that we did in the community, to see if the groundwater was having an impact on people's homes, part of that is actually what's called ambient air monitoring, where we tested not only inside the homes but the air in the area surrounding those homes. And we tested that down to some extremely low levels; the same levels that we would look for inside a dwelling. And we did not see impacts in the ambient air with these conditions existing.
So it's a fair question. But we did actually do some testing in that vapor.
MR. CARLIN: But we get visits from Pittsburgh, the steel mills are out there, I think some of the contaminants come over here and

MOHONK ROAD SUPERFUND SITE
they have affected the Adirondacks and things like that.
MS. CARPENTER: Right, but you're talking about materials like the acid rain that we get from the Midwest that kind of comes east. That is hundreds and thousands of pounds of contaminants that is actually going up a smokestack into the atmosphere. We are not looking at that kind of concentration.
Again, we have tested the ambient air in the area to see what the conditions are.
MR. CARLIN: So how many tons are we blowing up a smokestack?
MS. CARPENTER: We don't have a smokestack.
MR. CARLIN: Well, contributing to the air.
MR. BADALAMENTI: No, no. Our vapor extraction system is going

MOHONK ROAD SUPERFUND SITE
through activated carbon, which is absorbing anything being pulled out of the ground, it is not being discharged into the air.
MS. CARPENTER: Well, it is not being discharged into the air.
MR. CARLIN: Some of it is. I presume it is only X percent of that.
MS. CARPENTER: 99.99.
MR. BADALAMENTI: 99.99 plus.
MR. CARLIN: Like ivory.
MS. NAVRATIL: Fay Navratil, State Health Department. And then that carbon will be monitored and make sure there is no breakthrough. So it will collect. It is like a carbon filter on your water system. It will collect the contaminants. And then once it is loaded up, they will replace the carbon with new carbon.

MOHONK ROAD SUPERFUND SITE
And then they will dispose of it at an appropriate receiving facility.
Anything that goes into the air, even with the sub-slab depressurization system that's on the building up there, the amount that enters the air is minimal because it disperses, compared to other areas, let's say in the Midwest where they are pumping a lot into the environment.
And there is also, in the Midwest, there is also regulations on how much. I mean we have come a long way with regulations on how much people can put into the environment. They have to treat a lot of that, or treat it before it is released.
But what we are seeing up here, as Sal said, with the soil vapor extraction system that they are extracting from the ground is treated.

MOHONK ROAD SUPERFUND SITE

So minimal is released from that. And any sub-slab system, similar to a radon system that some of you folks might have in your buildings, where it is just released to the atmosphere and at that quantity is diluted virtually immediately and with the sunlight breaking things down, a natural process that occurs. And these are released at a level that it is higher than your breathing level. So you wouldn't be exposed to anything at that point.

I mean you got to take into account, you know we have things in the air all around us.

MR. CARLIN: What goes up comes down.

MS. NAVRATIL: Well, yeah. But it moves and it dilutes. But same thing, like they put, when you're pumping your gas, they have controls

MOHONK ROAD SUPERFUND SITE

so you're not breathing in fumes at your breathing level. So they take precautions so that you aren't -- you're breathing in minimal contaminants or they are released at a higher level.

MR. BADALAMENTI: Sir.

MR. MICHAEL STILLER: Hi, Michael Stiller. I have a three-part question. You talked about long-term monitoring, and I guess the first part is how long is long term? And the second part is will there be criterion established and published whereby we could determine if the MNA is actually doing what is required or what is desired? And the third part of the question is: Will there be a remedy available if it turns out that that criteria has not been met?

MR. BADALAMENTI: Well, yes. Certainly the criteria is going to be

MOHONK ROAD SUPERFUND SITE

to achieve and restore the aquifer. That's the original goal of the Record of Decision and that remains the goal. And that will depend upon the ARARS, the appropriate and applicable regulations. So the aquifer will need to be cleaned up to those requirements. That's when we will be done: When it's restored.

So we are going to be here a while. Unless some of these enhanced source removal things that we are doing make things go faster than we anticipated.

MR. STILLER: Is there any kind of timeline that is expected?

MR. BADALAMENTI: Based upon the modeling we have done, it might take as long as 30 years. There are some. This monitored natural attenuation study tried to look at particular chemicals at particular

MOHONK ROAD SUPERFUND SITE

locations. At some of the locations in half a year we expect them to drop to zero. In some it is going to take longer. It varies all over the place. So we will try to see whether those predictions are achieved.

MR. STILLER: So is the hope that within 30 years we get back to the point whereby people could actually use the water again?

MR. BADALAMENTI: Yes.

MR. STILLER: Below 5 parts per billion, whatever it is now?

MR. BADALAMENTI: Yes, that's the goal.

MS. STILLER: And how much faster do you anticipate it would be if the pump and treat would go into effect?

MR. BADALAMENTI: Based upon the modeling conducted, when the original second treatment system was

MOHONK ROAD SUPERFUND SITE

evaluated, that was also a 30-year time period. So they are both pretty close to the same amount of time.

MR. VINNIE GIBBS: Vinnie Gibbs, Berm Road.

Sal, have you calculated population increase and diversification? Because the figures that you're coming up with now, in another five to ten years will totally change.

MR. BADALAMENTI: We at one point looked at the census numbers for the population within the water district and projected a population of approximately 500 people within the water district.

MR. GIBBS: And that's currently.

MR. BADALAMENTI: That was the projected population. At what year, I can't recall right now.

MOHONK ROAD SUPERFUND SITE

MR. CARLIN: Roy Carlin.

I'm not trying to be unfair with respect to this, but obviously what you're working out is the problem that was created by the site. And I would presume that the community is making -- I'll put it new contributions to the problem. We don't have a sewage system here, so things are I suppose dumping into the aquifer. And I'm wondering whether your testing, periodic testing would pick up problems that we might have by our own contributions of bad stuff to the aquifer?

MR. BADALAMENTI: Well, when we were testing the private wells we did test for fecal, and we did find some bacterial contamination in many of the wells. That's why you had disinfection systems on some of the systems. So yes, septic systems are

MOHONK ROAD SUPERFUND SITE

contributing to deterioration of the aquifer, yes.

MR. CARLIN: So if you're obviously within the site, you're testing it. If we are beyond the site, I'm going to use the word unprotected, and we should be exercising some precautions or testing to assure that our own wells aren't being contaminated.

MR. BADALAMENTI: If you have a septic system on your property and you have a drinking well on your property, I would certainly recommend testing your drinking water well routinely.

MR. CARLIN: How often.

MS. NAVRATIL: Well, I'm not in the water supply system. You certainly can contact your county. There are regulations on how close your septic system can be to your

MOHONK ROAD SUPERFUND SITE

water supply. And I'm assuming that that's going to apply for a number of years. But contacting your county Health Department, they will be able to provide you with that information.

And just from experience, when you buy a home, there's requirements on having it tested, particularly for bacteria. And in some counties, they are looking at initiating sampling for volatile compounds such as what we have here, because -- this is closer to the city, this is Westchester County -- they are seeing these things. These are now prevalent in the groundwater supply. So they are possibly going to -- I can't remember what stage they are at, but may be requiring that testing to be done when you buy a home. Or drill a well. So the county would be your best communication with providing you

MOHONK ROAD SUPERFUND SITE

with information regarding the frequency of testing.

But if you have a competent septic system -- if you have concerns about your septic system leaking, certainly contact your county, they can give you some direction. With a competent system and your well an appropriate distance away from the septic system, you really shouldn't have any problems. But if you have concerns, certainly --

MR. CARLIN: What about heavy metals and other bad stuff that's in the water, is there some guidance that the health committee, whatever it is, health resources would give as to what you should test? I'm not concerned about people, you test for that. But there are other things that I'm reading about.

MS. NAVRATIL: You can take

MOHONK ROAD SUPERFUND SITE

your water sample to a laboratory and have it analyzed. But the costs amount up.

MR. CARLIN: But I don't know what to ask.

MS. NAVRATIL: The county and your water supplier. You must have a private well. But unfortunately, I would contact your county on that, and unfortunately, that's not part of this site, so we don't want to get sidetracked. But you would want to contact your county.

MR. CARLIN: It would be part of the site, because the same thing going on outside of the site is going on inside. So if we are contributing things from our septic systems or recycling or whatever, whatever, whatever, that should be hooked up on the site before.

MS. NAVRATIL: Not

MOHONK ROAD SUPERFUND SITE

necessarily. They determine the site contaminants and then that's what they are looking for. They are not going out and sampling for everything under the sun, like PCBs or heavy metals. I'm not sure, Amy could tell you what the contaminants -- well, we know what the contaminants of concern are. But once they have identified the contaminants of concern at the site, that's what they are looking for. Where if we don't have PCBs at the site, we are not going to test it farther out from the site, off-site for PCBs.

So your best bet is to contact the county health department for more information.

MR. BADALAMENTI: Ma'am. Identify yourself please.

MS. KATE REESE HURD: My name is Kate Reese Hurd. I live on

MOHONK ROAD SUPERFUND SITE

Mohonk Road, near 213.

When the water is pumped up to treat, to be treated, where does that -- where is that water discharged after it goes through the treatment process?

MR. BADALAMENTI: From the groundwater treatment system it is going into the Coxingkill Creek.

MS. HURD: So it is not being pumped back into the aquifer at that point?

MR. BADALAMENTI: It is not.

MS. HURD: And where do the activated carbon filters go when you change them?

MR. BADALAMENTI: The spent carbon?

MS. HURD: Yes, that have these pollutants now in them.

MR. BADALAMENTI: They go to a landfill or recovery facility that's

Page 62

MOHONK ROAD SUPERFUND SITE

registered, licensed to accept this material and safely handle it.

MS. HURD: So what do they do with them then to prevent these compounds from getting into the environment at that end of things?

MR. BADALAMENTI: Well, carbon often is regenerated and reused again, and that's through a heat process where it is heated and the fumes are burned off.

MS. HURD: So these chemicals, if they are burnt like that, then go through some kind of a process where they become innocuous?

MR. BADALAMENTI: And destroyed. Destroyed through heat, yes.

MS. HURD: Okay. Because that's one of my other questions. Amy showed us a chart of degradation pathways for these two, first of these

Page 63

MOHONK ROAD SUPERFUND SITE

things. Where can we get a copy of that?

MS. DARPINIAN: That is in the Monitored Natural Attenuation Assessment Report.

MS. HURD: April of this year?

MS. DARPINIAN: Yes. And the repository is at --

MR. BADALAMENTI: Either the Stoneridge Library should have a copy or the --

MS. HURD: Okay, and it is called the repository for the Mohonk site?

MR. BADALAMENTI: Yes.

MR. MC DONOUGH: Do we have that on site at the --

MR. BADALAMENTI: It should also be at the Rosendale Library as well.

MR. MC DONOUGH: Rosendale

Page 64

MOHONK ROAD SUPERFUND SITE

Library, thank you.

MR. BADALAMENTI: And if you'd like, I can send it to you e-mail as well.

MS. HURD: Oh, thank you.

Oh, I just wanted to mention that in the natural -- the monitored natural attenuation one of the things that I've learned about contaminants in the environment is that when they degrade, that doesn't necessarily mean that things are better. That some of the daughter compounds can actually be more pernicious.

MR. BADALAMENTI: Yes.

MS. HURD: And a compound that's been tested at certain parts per billion that's quite a significant amount and the effects are known, what seems to be -- have been overlooked, at least in the past, is that when it's at a much more minute level it

Page 65

MOHONK ROAD SUPERFUND SITE

has different effects, like hormone disruption and all of that. So that's a consideration that I have about this natural attenuation. And --

MR. BADALAMENTI: That's why we need to look to see that it's completely degraded. Products such as vinyl chloride, which is a big concern --

MS. HURD: Which is with the 1,1,1-trichloroethane -- no, it's the other one.

MS. DARPINIAN: TCE, trichloroethene. TCE breaks down to that.

MS. HURD: And we are counting on ultimately there would be daughter products that then vaporize and disperse that way?

MR. BADALAMENTI: Eventually, yes, those gases at the end.

MS. HURD: That's what it is. And hopefully that the amount of those compounds are not something that would affect human health. I mean you've tested ambient air and so on, but in the future, who knows, if this -- as the degrading goes on, if that would become more of a problem.

MR. BADALAMENTI: Well, that's why we need to be here to continue monitoring and making sure that --

MS. HURD: But those are questions --

MS. NAVRATIL: I just want to address some of your concerns. Because part of my involvement with these type of sites is to evaluate exposures to contaminants at the site. And what we have done and what Sal has noted is that there is various ways that you can be exposed to

contaminants. You're either going to inhale them. You're going to ingest them, via like drinking water, or you will come in direct contact with them. These are three ways you can be exposed to contaminants.

So what we look at these sites in the remediation is to mitigate any exposures. So we've done various things according to the Record of Decision for this site. We removed the source area, so folks aren't coming into direct contact with any contaminants. Drinking water, the ingestion of drinking water, of contaminated water has been mitigated via your public water supply system. Water comes from a distance away from the site. It is a water supply for New York City, and it is treated, tested, supplied to you. So you're not drinking contaminated water.

And then the third pathway would be in inhalation of vapors, and they evaluated that. EPA went out and collected the sub-slab soil vapor samples.

MS. HURD: Yeah, that's the present. I'm talking about as we go on. Sal answered that. As long as this is, that the daughter components -- I mean you are testing for the mother and father, you know, and we are talking about the grandchildren of these compounds. So just that that's really on your plan.

MS. DARPINIAN: I will say, although we focus on our contaminants of interest at the site, because they tell us the most information, when we submit our sample to the laboratory, we don't only ask for those four compounds. We ask for volatile organic compounds, and that's a very

long list.

MR. BADALAMENTI: That includes the daughters.

MS. DARPINIAN: That includes the daughters and the granddaughters.

MS. NAVRATIL: It is about 60 some odd compounds. And they have already analyzed for those, and they are not present. But as time goes on --

MS. HURD: Okay, fine.

Then there is just one other thing in this public forum that I want to bring up. I've been hearing lectures on the radio about water and that water is going to become more and more an issue. It already is an issue in many places. And that those of us who live where there is a fairly abundant supply of water, that we really do need to care for that water well. And looking toward the future to take -- to step up to the plate that we are not doing it just for ourselves, but we need to practice beginning now water conservation. Using water wisely. Because we may be called upon to share that water, and we need to have super fluidity to share.

In my household, for years now we have been collecting the warmup water for showers. And it's foreseeable to collect the wastewater from washing dishes so as to use that for other purposes where it doesn't matter how clean it actually is, and these low-flush toilets and so on. I just want to mention that to help start us thinking about really in the interest of each other.

MR. BADALAMENTI: Thank you.

MR. GIBBS: Vinnie Gibbs

again.

In deference to what was said about the backwash of the water, it's actually being -- well, some of it -- I can't testify to all of it -- it is being backwashed into the canal and sits there. What happens? It leaches into the soil, and then it proceeds down towards the creek.

There is a creek that runs from the site above, right down to the Rondout. It's not being used. And what's happening is we along that corridor, we are being flooded. Our wells, the old wells are rising above the topography and causing excessive water.

Now, I do have a further question there. Originally I was on the water committee here in High Falls many years ago, and it was at that time discussed that we would not have

this problem with the well. That it would be tied off -- not tied off, I'm sorry, opened in order to use for garden. Well, it has not come to pass. My well particularly is closed off. And then in order to open it up again, we have to pay someone, a plumber to come in and to open that up. And I don't think that's right. Especially since it was promised that the well would not be closed off, number one, and it would be available. And in conclusion, I just wanted to make the point that this is what's going on, and it should be addressed.

I'm not alone in this. There are several of us along Berm Road for example, of which, Sal, you are aware of, who have the same complaint. And we'd like to know how we go about this without having to bring in a plumber to undo what you

guys put together.

MR. BADALAMENTI: Let me just address that. I think you're referring about the discharge. Earlier I was speaking about the groundwater treatment plant which discharges to the Coxingkill Creek. The drinking water plant also backwashes its filters, and that water, after settling in the settling ponds gets discharged into the canal.

We have looked at the canal, and we see that it's clear. It is not obstructed. There is water that sits there. It's always sat there after rain storms.

MR. GIBBS: Until it leaches.

MR. BADALAMENTI: And the levels of waters in the canal are much lower than people's basements in the area. And in addition, that area has

MOHONK ROAD SUPERFUND SITE
all artesian wells, where the water is coming up from your own private well. It is making the ground in the area soggy. I don't think the discharge into the canal is contributing to that.
MR. GIBBS: I'm sorry. I totally disagree with that. I totally disagree with that.
MR. BADALAMENTI: I understand that.
MR. GIBBS: It is a fact. I've been there thirty years and never had the problem before, okay. So please don't say that you don't think that. It's not true. It's just not true. That is your backwash coming into the canal and then leaching down through us, okay.
MR. BADALAMENTI: Well, there's always been water in the canal.

MOHONK ROAD SUPERFUND SITE
MR. GIBBS: I've been here 30 years. We never had a problem until now. So we would like that addressed.
MR. BADALAMENTI: A lot of people are no longer pumping water from their wells, so groundwater is rising as well. So there are many factors that are at play.
MR. GIBBS: But we have an increase in the population also. So that's not really a viable fact.
MRS. STILLER: Aren't the levels in the well be getting lower because the pumps are being treated?
MR. BADALAMENTI: Close to the site where we are doing the pumping, the groundwater levels are dropping, because we are pumping at a higher rate. But we are also seeing a rise in water levels in other areas where it is not being pumped anymore

MOHONK ROAD SUPERFUND SITE
by the private wells.
There are some areas that have historically been artesian in nature, and many of the private wells in the area have drainage systems because the wells would overflow their casings.
Ma'am.
MS. EATON: I'm Sharen Eaton from old Route 213. My question is in regard to the wells that have been sealed. We were told that we could have a plumber come out and adapt the wells so that we could use it to water. But my question is, if a well is contaminated, and we are now on a drinking water system to avoid using that water, why would we -- how can we use that water to water a garden, which may consists of vegetables or flowers; in any case you're exposing that contaminated water to the air

MOHONK ROAD SUPERFUND SITE
with vapors and whatever else is there. Is that something that should be allowed, to open that well?
MR. BADALAMENTI: Well, we would have advocated for the wells to have been sealed permanently and never to have been used. However, the towns chose not to restrict a person's right to property. And the compromise was that for public health reasons you must tie into the public water system. Those wells were labeled for nonpotable use. I don't think we ever made a commitment that we would provide you with an outdoor spigot so that you can continue your use. That was allowed by law under the town ordinances. If you wished to do that, you could.
Is it a wise thing to do? Put on your vegetables, I defer to the Health Department.

MOHONK ROAD SUPERFUND SITE

MR. GIBBS: The amount of contamination, is so minuscule -- I'm sorry to disagree with you, young lady. It is so minuscule it is not going to affect your vegetables, etcetera.

MR. BADALAMENTI: Well, let me say, there are some wells that were contaminated and some were not.

MR. SIVAK: Michael Sivak. We understand your question. And a lot of people have asked that same question at a number of sites we worked at. We looked at the levels of contaminants and the types of contaminants here. When you think like sort of what Faye was talking about earlier, which is how you might be exposed to these chemicals, using the water as an irrigation source to water a garden or your lawn or wash your car, something like that, some

MOHONK ROAD SUPERFUND SITE

nonpotable source, you're eliminating the kind of exposure you might have to it. You're not drinking it. You might get incidental splashing or wipe your hands. Those types of exposures are so minor and incidental you shouldn't worry about them.

The types of chemicals we have at this site are volatile chemicals. Although you're finding them in the groundwater, they like to volatilize into the air. Evaporate into the air. It is like when you spill nail polish, it evaporates. It likes to be in the air. When they are in the ground and deep, they prefer to be in the groundwater rather than soil. When you expose them into the air, they have a tendency to volatilize into the air.

So when you're out there and watering, the impact to the garden is

MOHONK ROAD SUPERFUND SITE

twofold. One, it is going to volatilize as you're spraying out. And number two, these types of chemicals are not the types of chemicals that partition into vegetables. They don't like to be there. So I wouldn't worry about it.

MS. NAVRATIL: I would just like to add one more thing. The wells are marked nonpotable, and we would not suggest filling up a kiddy pool with it, so that kids are splashing around in it. We really recommend that you hook up -- well, you have hooked up to the public water, and use that as a source.

If your well originally was contaminated -- you know, I can't tell you, I don't know, if it wasn't contaminated and you want to switch it over for irrigation, you know, that shouldn't be an issue. But I don't

MOHONK ROAD SUPERFUND SITE

know what your particular situation is. But we still recommend that you maintain the public drinking water and use that.

MR. BADALAMENTI: Yes, sir.

MR. MC DONOUGH: My name is Patrick McDonough.

I would like to say when the towns did, there were a lot of people who had wells and wanted to continue their water. And there was discussion at the time about, you know, the water is contaminated, there are health concerns. And when the two towns passed the law creating the district and we diseased to allow those who wanted to continue to use that water for nonpotable purposes, to allow them to continue it use it, it says right in there that the users of the water need to understand that it is contaminated water; that the

MOHONK ROAD SUPERFUND SITE

municipalities can't be responsible for any ill effects or health concerns, or the EPA who created the district, or the High Falls Water District. Just so that it was very clear that it is contaminated water, and it should not be used for any other purposes. We made sure that was pretty clear.

I actually had a couple of things. Are the documents from the DEC and the New York State Department of Health, are they available in the documentation with the rest of the -- is that the things that are in the library?

MR. BADALAMENTI: Do you mean the original DEC studies?

MR. MC DONOUGH: No, the state acceptance of the plan, of the remediation plan.

MR. BADALAMENTI: We have a

MOHONK ROAD SUPERFUND SITE

concurrence letter from New York State, which will be become part of the Record of Decision when it is published.

MR. MC DONOUGH: And that is from the Department of Health and the DEC?

MR. BADALAMENTI: Yes, it speaks for both.

MR. MC DONOUGH: I just want to make sure.

I kind of wanted to go back to the short-term effectiveness criteria that you have here. I understand what you're saying in here, and I guess my concern is that it's just in the wrong place. Because you talk about -- it is titled short-term effectiveness, but really what you talked about there are health impacts. And it seems it should be in the first criteria that talks about the overall

MOHONK ROAD SUPERFUND SITE

protection of human health and the environment. Because what happens with construction, according to this, is that some of the volatile chemicals could be released during that construction process. Because it seems like the effectiveness for either 2 or 3 is about the same from some of the discussions that have been had here, already that the effectiveness is about the same. But those things are actually impacts that perhaps should be under human health. Just a comment to consider.

MS. CARPENTER: In general, under the Superfund Contingency Plan, all the implementing regulations for Superfund, overall protection of human health and the environment is the criteria by which we look at the end point of the remedy. Will the remedy itself protect the people and the

MOHONK ROAD SUPERFUND SITE

environment. The short term --

MR. MC DONOUGH: So not the process.

MS. CARPENTER: Right. The short-term effectiveness looks at construction impacts, impacts to the community in terms of maybe shutting down roads like when we were blasting, that kind of thing. So short-term impacts of actually implementing the remedy.

Then we have kind of long-term effectiveness, how does each component of the remedy match up against each other.

So where I understand where you're coming from, you would have to kind of go back and try to assess each remedy at every site in a consistent manner, so the overall protection of human health and the environment and compliance with ARARS regulations,

Page 86

MOHONK ROAD SUPERFUND SITE

what we call threshold criteria, we have kind of an established language that goes with each.

So you're right in that we talk about human health impacts in two different areas, and it can be a little confusing. But one is global remedial end point versus if we are going to emit dust because we are digging holes or spray water, it is that kind of a health impact.

MR. MC DONOUGH: Good. I see the way you differentiate it.

MS. CARPENTER: We don't like to make it too easy.

MR. BADALAMENTI: Miss Skiller.

MS. SKILLER: I'm confused about the answer that you gave before that G-2 and G-3 would cause the long-term cleanup to take the same amount of time. I was under the

Page 87

MOHONK ROAD SUPERFUND SITE

understanding that to remove the groundwater into the pump and treatment plant and actually treating it was the chief way in which the VOCs were taken out of the water and removed from the aquifer. And it would seem to me that having a second plant, even subtracting the time for construction, would cause that process to happen twice as fast as it would without.

So I guess I'm confused why you're saying it is going to take the same amount of time. And I'm not really sure why it would be decided that we wouldn't want or need to speed up that process.

MR. BADALAMENTI: Well, I can only look at the modeling that was conducted that evaluated that alternative. And the estimated time frame was approximately 30 years, and

Page 88

MOHONK ROAD SUPERFUND SITE

we think the average time frame for the MNA is also 30 years.

MRS. STILLER: Why would you think that would be --

MR. STILLER: Did you do a model with both together or just it just one and the water treatment model did not take into account the MNA? You know, if two remedies taken at the same time, you'd think there would be a cumulative effect, even if it wasn't twice.

MR. BADALAMENTI: Yeah, I'll I need to take a closer look at that.

MRS. STILLER: Well, it starts to make it seem like really this decision is based on cost. And of course, as a community we have been told this is what the remedy is going to be, and now we are being told, well, the second plant is not going to be constructed. It is hard for me as

Page 89

MOHONK ROAD SUPERFUND SITE

a citizen of the community to not say EPA does not want to spend the money to do this more quickly. And I want EPA to spend the money to do it more quickly, because 30 years is a long time.

MR. BADALAMENTI: I understand your concern.

MRS. STILLER: I sort of feel like that's the elephant in the room that's not being addressed. That is it really an issue of, well, it is just as good to do G-2, or is it really EPA wants to save the money because, well, it is good enough.

MR. BADALAMENTI: EPA has invested over $50 million at the site.

MRS. STILLER: I'm not saying EPA hasn't invested. I'm just saying for me, I would like to know if it is really that it's not necessary, or if it is being judged on the basis

MOHONK ROAD SUPERFUND SITE

of, well, this money is no longer available.

MR. MC DONOUGH: And also it was the EPA's obligation to invest $50 million in this site. After investing $50 million, you would think $5 million would be pretty much a drop in the bucket. So I think it is a fair question to ask: Is one really that much more effective than the other, and is one going to get the job done more quickly than the other. And if it is going to get it done more quickly, it should be a cost and benefit analysis, not just a cost analysis.

I was trying not to be contrary before, but one of the comments I was going to make, personally I don't think cost should be one of the criteria, but.

MS. CARPENTER: It is by

MOHONK ROAD SUPERFUND SITE

law.

MR. MC DONOUGH: No, I understand that. I have to deal with the law too, so I understand.

MR. BADALAMENTI: Sir.

MR. BOB HAMM: Bob Hamm, Mohonk Road.

Are you pumping at any rate now: Because we have two wells that seem to be flooding over, and they never used to be an artesian well. And we were told the reason we had to put the water system in is because when you start the remediation, you're going to be pumping all the water out of the water table. Now the water table is rising, so why didn't we just stay with the filters? We wouldn't be flooding our lawns.

MR. BADALAMENTI: What area are you located?

MR. HAMM: Right in the

MOHONK ROAD SUPERFUND SITE

backyard.

MS. DARPINIAN: We have increased the pumping at the groundwater treatment plant much higher than we used to be able to. Because we used to drop people's private wells down. Now they are disconnected, we can pump much higher. But the zone of influence we were talking about before, that capture zone, if you're pretty close down here to 213, that capture zone is not extending all the way down here.

And I didn't know we had artesian well conditions down here.

MR. HAMM: We never used to.

MS. DARPINIAN: It is probably indicative of the water table.

MR. HAMM: If I didn't open the one pump in the basement and let it run out the floor drain, it would

MOHONK ROAD SUPERFUND SITE

be running out in the neighbor's lawn.

MR. BADALAMENTI: There has been a lot of rain this year. We have increased the pumping. We used to pump 30 gallons a minute; we are now close to 50 gallons a minute.

MRS. STILLER: Would having a second pump -- that's another consideration, people are having their lawns routinely flooded.

MS. DARPINIAN: We can't remediate for something that's not an environmentally caused problem.

MR. HAMM: There's a slew of water now running down the road.

MS. HURD: It is caused by the whole situation.

MR. GIBBS: If they would just, instead of pumping it into the canal, pump it into the creek that runs down into the Rondout, it would solve the problem. Simple as it

MOHONK ROAD SUPERFUND SITE

sounds, that would solve the problem.

MR. BADALAMENTI: Well, it is going from the canal into the Rondout Creek. You're saying it is not making it?

MR. GIBBS: It sits in the canal, and then it leaches down into our well, pushing the water up. It's never happened before. 30 years.

I don't know how long you've been here, young fella.

MR. HAMM: A few years more than that, like 58.

MR. GIBBS: You see what I'm saying. He has more experience than I have.

MR. BADALAMENTI: We are aware there were some artesian areas, like up near Berm Road that has been artesian all along. This area might be new to us. Why it's occurring, I'm not a hydrologist. I don't know.

MOHONK ROAD SUPERFUND SITE

MR. GIBBS: Might we get one in?

MR. BADALAMENTI: We can certainly have a hydrogeologist take a look at the situation, yes.

MR. GIBBS: Might be a good idea.

MS. HURD: Yes, that sounds like a very good idea.

MR. GIBBS: I second the motion.

MR. BADALAMENTI: Mr. Stiller.

MS. HURD: Are we agreed on that?

MR. BADALAMENTI: We'll take a look and try to respond in the Responsiveness Summary.

MR. STILLER: Hi, Michael Stiller again. A couple of things. I want to double back about what we were discussing before about the two plans

MOHONK ROAD SUPERFUND SITE

and the efficacy of one versus the other or versus both.

I do appreciate that the EPA has spent a lot of money, and we have a great water system, and that's all great, and it really is appreciated. I do also think, in coming to this meeting, I feel a little bit that data hasn't really been given to us. I wouldn't say it's been given to us in a non-straight manner or being dishonest, but I feel we are not getting the whole story. I feel that way, because -- maybe I'm wrong because I'm not a scientist and I don't know anything. But if someone tells me we have two methods of dealing with the problem, if we do two of them at the same time -- two people cleaning the floor isn't going to clean it any quicker than one. I think I guess there could be

MOHONK ROAD SUPERFUND SITE

situations that could be the case, but I wonder.

When I asked you the question about did you model with both, you honestly said you don't know and I appreciate that. At the same time, if you came here and said to us, you know, if we did the second treatment plant, it would make it go quicker and this much more and we did a cost-benefit analysis, and again maybe that information isn't there. Maybe what you've said is the end of the story, but I just want to bring up, and maybe it is sort of bad luck, the story we are hearing makes us wonder or makes some of us wonder, but it does. So if there were another answer, I'd be really happy to hear it.

Now, I'm not the kind of person who would say well, you have to

MOHONK ROAD SUPERFUND SITE

spend a million dollars to get a hundred million worth of benefit. I'm not that person. But it is good if we all get to hear it and make that judgment. So I just wanted to say that.

MR. BADALAMENTI: Thank you.

MR. STILLER: I want to ask a question a little off topic, about the census and 500 residents. I'm not sure if you were saying, making a comment about what the water system was designed to support. I was under the impression that the system was designed to support some multiplication of the existing population, because of course more people are going to move in. Is that true?

MR. BADALAMENTI: Yes.

MR. STILLER: What is the number?

MOHONK ROAD SUPERFUND SITE

MR. BADALAMENTI: There were several methods to try to project the predicted population. One was to look at the existing census and other methods used in design of water treatment facilities to predict the projected population.

MR. STILLER: How much of a population increase can our system afford?

MR. BADALAMENTI: The system was designed for at least 525 residents.

MR. CARLIN: How many are there now?

MR. JOHNSON: There is 440 on the system right now.

MR. STILLER: So is 525 the max?

MR. BADALAMENTI: No, I think we can support more than that.

MR. JOHNSON: The treatment

MOHONK ROAD SUPERFUND SITE

plant has the capacity to supply a lot more than that. It is going to hold this town for years to come.

MR. STILLER: I ask because I'm concerned. I imagine the scenario 20 years in the future, the population has exploded in the area to a great degree, ten fold. And all of a sudden we are in -- I realize it is a done deal -- the system we have can't support anymore, but we are not allowed to use the water in the ground and maybe for good reason. That's the kind of scenario that I fear.

MR. BADALAMENTI: Well, again, the goal is certainly to restore the aquifer and make the aquifer usable.

There is a lot of excess capacity at this point in the drinking water plant. It was designed for a 20-year service life.

MOHONK ROAD SUPERFUND SITE

MRS. STILLER: But you said it was going to take 30 years before it was remediated. What about the extra ten years? We hope to still be alive.

MR. BOB ANDERSON: Bob Anderson.

Sal, you say this is system is designed to treat X amount of population and --

MR. BADALAMENTI: Yes. The numbers, the 500, I'm not sure if that was the existing population versus the projected. I can't recall right now. But okay.

MR. ANDERSON: My concern is that -- I'm sure the people that are residents here know that Ulster County Community College is looking at putting in dormitories. And their statements have already been released that they are looking at tying in water system from this system all the way to the Ulster County Community College.

Now, number one, is this system designed to facilitate enough water supply to feed that? And can they legally do that? Because this system was not put in to feed them water.

I realize it is probably not in your expertise. But for volume of water, I mean that's your expertise.

MR. BADALAMENTI: Well, we know what the capacity of the system is, and that's black and white. Whether or not the water district chooses to expand its service area, that is not a function of EPA.

MR. ANDERSON: Is this system able to supply water to another thousand people or 500 people in dormitories? And of course, if that

line is put up, we know that there's going to be additional houses attached. I mean we know basically, because we know basically, I mean the locals that are here can see the handwriting on the wall where this is going to go. There's an awful lot of places in Stoneridge that don't have water right now. Wait a minute, now we got a water line coming through here, now we are going to attach onto this.

MR. BADALAMENTI: Again, EPA has no authority as to what the water district chooses to do.

MR. ANDERSON: That wasn't my question to you. My question is: Is this system designed to hold another thousand residents?

MR. JOHNSON: My name is Terry Johnson.

It wouldn't be a thousand

residents. The college is calling for 25,000 gallons a day. If and when that did go into effect, it would take a public hearing and authorization of two town boards to do that.

MR. ANDERSON: I understand from our local legislators that, from two of the local legislators that the town boards and the Ulster County Legislature has absolutely nothing to say about whether they put dormitories in the college or not.

MR. JOHNSON: The town boards have nothing to say about it, but if they want to supply water to it, that's what's going to apply. With no town board approval, no water. So it is a ladder, and it is not something that happens overnight. And the plant could supply that.

MR. KLUESNER: If I could have one at a time. We can't record

multiple conversations.

MR. ANDERSON: Basically, it is a political matter that the taxpayers have no voice over. Because the Ulster County -- whatever they call the board that runs the college is an entity upon itself. It creates whatever it needs, and it doesn't care.

I mean this is the voice of our two legislators in the area. One from the town of Marbletown and one from the town of Rosendale, say the Ulster County Legislature has nothing to say about whether they put dorms in Stoneridge or not.

MR. JOHNSON: Again, if they don't have the water supply, their wells will not supply that. That's why it never moved any further than it did. Again, it would still take two town boards, public hearings, authorization, that the Health Department would regulate that. If they don't think the plant could supply it, it is in the going to happen. It is not something we can take it to the wire and say we think we can do it, it is not going to happen.

MR. ANDERSON: That was my question to Sal, whether this system was designed to facilitate the extra people.

MR. JOHNSON: Right now it is running at about 18 percent of its capacity to feed this district.

MR. ANDERSON: So that's 18 percent of 500 people?

MR. JOHNSON: Of its total capacity right now.

MR. ANDERSON: That means we could support two or three thousand people.

MR. JOHNSON: Not to say you would want to do that, because you're taxing the plant. I'm saying what the plant is capable of producing, we are at about 18 percent now.

MR. MC DONOUGH: Patrick McDonough. I know this discussion doesn't have much to do with you guys. But it is going to be a long process, and while the college could put in dormitories if they want to put them in, they don't have water. And they won't have water unless the two towns agree to it. And for the two towns to agree to it, the capacity of the plant has to be sufficient to be able to do that. The Department of Health has to approve it. The college would have to build the infrastructure and pay for it to be able to do that. So there's a lot that would have to happen before that would ever happen. And it is not

going to be an easy thing for them to do, if at all.

MR. ANDERSON: According to the last notices they put into the Bluestone Press, etcetera, the college is actively looking at putting in the dormitories.

MS. HURD: May I ask -- this is Kate Reese Hurd -- is there conceivably the possibility that the treatment plant could be enlarged if this plan -- I mean --

MR. BADALAMENTI: Anything is possible.

MS. HURD: So the treatment capacity could be larger?

MR. JOHNSON: Anything is possible on that end.

MS. HURD: Even though it is using 18 percent of the capacity now, is that total capacity a just physical limit?

MR. MC DONOUGH: Could you double the size of the plant?

MS. HURD: That we are not allowed to take more water from Ashokan?

MR. JOHNSON: We are under a contract from New York City. We can only take so much water without being penalized. If the college were to go into effect, we would have to renegotiate with New York City. We can't just endlessly keep pumping out of there. It doesn't work that way.

MS. HURD: So Ulster Community College, they would have to take that up.

MR. JOHNSON: Yes, as a district we would have to renegotiate with New York City and say this is what we are looking at doing.

MS. HURD: It is not fair this community should bear the load.

MOHONK ROAD SUPERFUND SITE

MR. JOHNSON: No, they would have to pay operation and maintenance, a bond, things like that. Operation and maintenance, it is not just a free ride.

MS. HURD: We would not just be asked to give away what was ours. It would be --

MR. JOHNSON: No, no.

MR. BADALAMENTI: Mrs. Stiller.

MRS. STILLER: I want to get back to the second treatment plant.

MR. BADALAMENTI: Yes, I know.

MRS. STILLER: Do you have any hard data of the comparison of what the amount of contaminants over time looks like if G-2 and G-3. Because I feel honestly as a citizen I don't have any hard data on which to make an informed decision. All I have

MOHONK ROAD SUPERFUND SITE

is you telling me it is going to take the same amount of time, which logically doesn't make sense to me.

MR. CARLIN: Could your modelers generate a graph?

MRS. STILLER: Have there been projections we can see?

MR. BADALAMENTI: Yes, in the MNA study we talked about, the April 30th study, the eight years of monitoring, groundwater monitoring data was looked at. We looked at what was happening trend wise at each well for each contaminant. Based upon that evaluation, there are different rates of degradation in different areas for different chemicals. And that analysis indicated the average to be approximately 30 years for the MNA.

Again, for the second treatment system, the far-field treatment system, that was evaluated

MOHONK ROAD SUPERFUND SITE

via groundwater model, when the original RFS was conducted, and that also estimated a 30-year time period. So that's what I've stated here tonight. The time frames are basically equivalent.

MRS. STILLER: But you also agree it doesn't make sense, right? Is there a way that you can understand, being more knowledgeable than I, how that makes sense so you can explain it to me? Or doesn't that make sense to you either?

MR. BADALAMENTI: Well, it does make sense. I think the projections on the most recent method that we used in the MNA assessment are likely more accurate than the ones that we did nine or ten years ago when the original Record of Decision was signed.

MRS. STILLER: So is it

MOHONK ROAD SUPERFUND SITE

possible then in fact the original assessments were too pessimistic?

MR. BADALAMENTI: I don't know.

MRS. STILLER: No, I'm just asking how you -- again, as someone who understands this better than I do, how you would explain what seems to be an illogical conclusion. What's your idea of it? What's your theory?

MR. BADALAMENTI: I will try to get a firmer answer from a hydrogeologist on that.

MR. KLUESNER: If I could suggest, if you can leave your contact information so there Sal can either e-mail or mail or --

MRS. STILLER: We signed in.

MR. MC DONOUGH: I would like to say something directly related to that before -- I know you're going to check on this, the two models that

MOHONK ROAD SUPERFUND SITE
were done, the model for the MNA and the model for the second plant, each of which looks like it will be about 30 years, and you're going to check to see if the models were combined, because you weren't sure of that. And I'd just like to know that that will be checked, and if the two models were not done together, will they be done together, and if they are done together, will we get the results of that?

MS. CARPENTER: I'm trying to think of what components are in that. Let me just make sure that I have the -- there was a lot in that statement.

MR. BADALAMENTI: Yeah.

MS. CARPENTER: I started writing stuff down. There's a request on the modeling of the two plants operating simultaneously?

MOHONK ROAD SUPERFUND SITE

MR. BADALAMENTI: Yes.

MR. MC DONOUGH: Yes, adding --

MS. CARPENTER: Okay, that would be one.

MR. MC DONOUGH: Adding the second plant.

MS. CARPENTER: Right. So having two plants operating simultaneously.

MR. STILLER: I have to jump in, because I think I brought this up at the beginning. For me, it was not just about the two plants simultaneously. Because from what I'm hearing, it's one model was MNA, the other model was the second treatment plant. However, the second pumping treatment does not exist without the MNA occurring. MNA occurs whether you do anything or not. So my question was did the model with the plant

MOHONK ROAD SUPERFUND SITE
combine the two? Because otherwise it doesn't make sense. Know what I mean?

MR. MC DONOUGH: Right. So my question, to follow that up, was if the models were not combined, to see if it has sort of a cumulative effect by doing both at the same time, will those models be done and will we be able to see the results of that?

MR. BADALAMENTI: We'll respond to that in the responsiveness document.

MR. STILLER: We will spend that money anyway.

MS. HURD: This is Kate.

To clarify, we are talking about a second treatment plant for the far-field plume. So we are talking about a lesser degree of contamination to start with.

MS. DARPINIAN: Absolutely.

MS. HURD: And not to give

MOHONK ROAD SUPERFUND SITE
you guys an out or something, but is it that it is much more effective and immediate getting a larger amount of contamination out than it is to get a smaller amount? And if that's part of the reason for thinking that maybe it equals out? But we really do need to see that there's not just a cost evaluation, but cost-benefit, and that--

MR. BADALAMENTI: It is not just a cost evaluation and decision.

MS. HURD: But we are starting at a lower level of contamination and to get it to go lower yet maybe is --

MS. NAVRATIL: You're correct. A lot of analyses are like that. You get to a point where you can keep pumping and pumping and pumping and you will have the same level of contamination in the ground,

Page 118

MOHONK ROAD SUPERFUND SITE

and you keep pumping and pumping and pumping, and it is still there. So that all goes into the analysis as well.

MS. HURD: So you have to pump more water to get less out.

MS. NAVRATIL: Right.

MR. BADALAMENTI: Yes, sir.

MR. CARLIN: Roy Carlin.

I could understand perhaps how the end points of both at 30 years might be the same. But the decontamination on a timeline might be much greater with the two plants than one plant. So I think that your report, in order to be helpful, has to show this on a timeline basis rather than at the end of 30 years only.

MR. BADALAMENTI: These are very difficult things to model in the first place, especially with the hydrogeology around here, with the

Page 119

MOHONK ROAD SUPERFUND SITE

fractured bedrock. If you recall, we couldn't even predict whether if this house's well was contaminated, the house next door may not have been contaminated. So it is very difficult to make predictions with regard to the rates of degradation and which way the groundwater is going on a more small-scale basis. So that also affects these modeling results.

Sir.

MR. GIBBS: I don't want to kill a dead horse again, but what would the cost factor be to remediate the problem discussed before about dumping into the canal and having the runoff? It is really a construction job, and I'm just wondering if that could possibly be a budgeted item, building some kind of aquifer to carry it down to the creek?

MR. BADALAMENTI: We had not

Page 120

MOHONK ROAD SUPERFUND SITE

estimated the cost of that, because we felt what was done was being effective.

MR. GIBBS: County should have though, right.

MS. DARPINIAN: County would not, because they were not scoped to do that.

MR. BADALAMENTI: Yes, that's right.

MR. GIBBS: Is there a possibility of getting that information, discerning what type of project it would be?

MR. BADALAMENTI: I'll --

MR. GIBBS: -- get the hydrologist.

MR. BADALAMENTI: You know, it is not a simple matter of just costing out a piece of pipe.

MR. GIBBS: It is a big fat pipe.

Page 121

MOHONK ROAD SUPERFUND SITE

MR. BADALAMENTI: We'll respond to your concern in the Responsiveness Summary.

MR. GIBBS: Please.

MR. BADALAMENTI: Yes.

MR. MC DONOUGH: Patrick McDonough again.

Just to follow up on what was said before on the efficiency of doing the groundwater extraction in the 5 parts per billion section of the plume, would it make sense to place the extraction point in the model in the hundred parts per billion section of the plume rather than 5 parts to make it more efficient?

MR. BADALAMENTI: Well, sure. You can model anything and different variations.

MR. MC DONOUGH: Because it probably wouldn't be that efficient if it were in the 5 parts per billion section of the plume.

MR. BADALAMENTI: Because you're pumping nearly clean water.

MS. CARPENTER: Honestly, an extraction well wouldn't go into the 5 part per billion. When you do remedial design, you have conceptual designs at the early phase.

MR. MC DONOUGH: I did see that in one of the pictures that it was in the 5 parts.

MS. CARPENTER: An extraction? There is monitoring wells in that area.

MR. MC DONOUGH: Okay, thank you.

MR. BADALAMENTI: The proposed location of a second plant and where its extraction points would be have not been even evaluated.

MR. MC DONOUGH: But it wouldn't be in the five.

MR. BADALAMENTI: Wouldn't be in the five. The far-field plume is anywhere from five to one thousand parts per billion, so.

MRS. STILLER: So do you know why was it initially thought there would be two plants? Was it just they thought the extent of the plume was two would be needed, or was there another reason?

MR. BADALAMENTI: To increase the capture zone. But at that time we did not know that the plume would stabilize and not keep going and going and going. Now we know it has.

MS. NAVRATIL: Please keep in mind that when they do the monitored natural attenuation, they continue to monitor. If the data indicates that maybe something is getting worse, then options to deal

with that would be evaluated. So it's evaluated on -- and eventually, as Sal will probably say, this will revert to the state, and the state will keep an eye on the site and make sure that the remedy is working as expected. If not, other options will be evaluated to deal with the situation.

MRS. STILLER: That is a little bit what I'm worried about. Because I feel that now this is a Superfund site that's being handled by EPA. And I don't know how it works in terms of how long EPA has the responsibility to continue to provide oversight. But the finances of New York State aren't terrific. So I would say that if five or ten years down the line I knew that EPA has done what its responsibility is and that it gets handed over to the state, that makes me nervous, because I think what

if projections are wrong and ten years from now it is no longer under the rubric of EPA and we have to ask the state for additional funds.

MS. NAVRATIL: But the state has a similar program, and we have a lot of sites in the state Superfund program on the registry, the registry sites. So we have similar programs set up. Except at some point EPA had to come into this program to provide immediate assistance. They were called upon by the state to handle the situation, so eventually it will come back to the state to manage.

MR. STILLER: What's the criterion for EPA handing it over to the state?

MS. CARPENTER: The Superfund law says that after ten years of operation under EPA, the remedy operation, that the states take over the remedy. That goes for the groundwater pump and treat plant at the main site, and then there would be a separate tenure clock for the MNA component of this.

MR. STILLER: So at least another ten years.

MS. HURD: Of the MNA.

MR. BADALAMENTI: The groundwater plant has been operating eight.

MS. CARPENTER: Yes, the groundwater treatment plant has been operating since 2000.

MR. STILLER: But the MNA, when does that start?

MR. BADALAMENTI: If we make the decision to go ahead with MNA, it will be this year.

MR. HAMM: If you don't start it, then the clock doesn't start. So then you're back to the

clock of 2000 and in 2000, my God, only two more years and you're done and out of here.

MS. CARPENTER: No, we have to address the entire remedy. So one way or another we have to address the piece that we are talking about tonight. So EPA is in this picture for another ten years.

Let's also keep in mind that turning the -- it then becomes O&M, operation and maintenance, over to the state does not mean this is no longer a Superfund site. There is a formal process for deleting a site from the national priorities list. Turning it over to the state does not constitute that process. That is a public process. We would again be coming to the community and we would be saying we have achieved the cleanup objectives; meaning the aquifer has

been restored, there is no residual source on site. We are done, the state EPA, whatever. And that may be at some point several decades in the future. But transfer to the state does not remove it from the federal Superfund list.

MR. BADALAMENTI: Mr. McDonough.

MR. MC DONOUGH: Let me say I misspoke before because I looked back in the document. And all it says about the second extraction site is that it is not on the MRIP. That it is just off that property, so.

MR. BADALAMENTI: With that, seeing no further hands.

MR. KOEHLER: Martin Koehler. I have never commented, and my concerns are being a retired water plant treatment operator, I went through the plant, everything is going

beautifully. I think you have a great system here. That's number one.

MR. BADALAMENTI: We sure do.

MR. KOEHLER: That's number one. What my main concern is, something that's important, the hydrant system, okay, was never constructed to drain properly. And I'm worried about the High Falls Water District, the taxpayers, the people that pay, having broken hydrants in the winter, while Terry and I, we are familiar, Bobby, when we open a hydrant in the cold water we have to take an electric pump and pump it out to drain it. It should have actually been constructed and to drain automatically, like every normal hydrant drains.

Now, I understand that's a civil environmental engineer, and I

Page 130

MOHONK ROAD SUPERFUND SITE
wear many hats also, so I'm familiar
with another problem claiming the
water table is up too high. Well,
that naturally, this day and age can
be rectified and remedied with washed
stone, similar to a septic system, to
drain. Which should have been done
actually. I'm sort of concerned about
that.
And I have a little gripe
against Conti. I have been bringing
into my property loads of Item 4 and
topsoil and so on. I have a lot of
cave-in, and I had promises they were
going to do work for me. And they
were here like about a month ago and
they showed up so late with blacktop,
that I told them to get off the
property. I mean the blacktop -- do
you have a torch, and thank God I do
have a roofers torch, the kind that
blows 500,000 BTUs a second. I tried

Page 131

MOHONK ROAD SUPERFUND SITE
to heat up the blacktop, I couldn't
even heat that up to work it.
So I'm wondering, what's my
stance on getting Conti to come back.
MR. BADALAMENTI: We had
several meetings where we asked if
there was any restoration issues?
MR. KOEHLER: They promised
me, said they were going to come back
and do it, they were here about a
month ago, promised me they were going
to get to it, and then they are gone
again.
MR. BADALAMENTI: I'll look
into whether your concern was raised
earlier and whether or not it was
addressed.
MR. KOEHLER: Thank you.
Because my name was on that list. And
I didn't see any results, okay.
MR. BADALAMENTI: With
regard to the fire hydrants, I think

Page 132

MOHONK ROAD SUPERFUND SITE
all parties, including the state
Health Department who inspected the
plant's specifications with regard to
the types of hydrants, I know
representatives of the town reviewed
the plans specifications as well.
There may be several types of hydrants
available, frost-free hydrants versus
these that have to be pumped out.
MR. HAMM: It is just the
fact that they left the plug in the
bottom. If the plug was removed, it
would drain.
MR. KOEHLER: It is that
simple.
MR. JOHNSON: It's
contaminated water. You can't take
that chance. You can never take that
chance. If the water is contaminated,
we spent $20 million, you don't want
that water touching potable water. It
goes contrary to our backflow

Page 133

MOHONK ROAD SUPERFUND SITE
prevention program. You just don't
want to have it. To be inconvenienced
at a pump hydrant to have to pump out
a hydrant is well worth the safety
value.
MR. BADALAMENTI: There's
the answer.
MR. KOEHLER: Hooked up to
the water supply, the check valve,
there is no groundwater.
MR. JOHNSON: If that check
valve fails, when it gets sick, this
water is not good. It is NG, no good.
MR. KOEHLER: If it is
hooked up to the supply pipe.
MR. JOHNSON: There's only
one pipe. It comes off every supply
pipe. That would mean running double
pipes, double the cost. It is an
inconvenience we will have to deal
with it.
MR. GIBBS: I thought it was

New York City water.

MR. JOHNSON: It is the groundwater that's in there. So that hydrant sits in there. He's talking about artesian, he's got water running in your yard. I don't care how much washed stone you put around that hydrant, if I have a low pressure situation or water main break, it can literally pull that water back into the system. You don't want that to happen.

MR. BADALAMENTI: It is a health problem.

MR. KOEHLER: As far as the pumping, what we are talking about, aeration of the contaminated water, purified by air and sun. But you can only pump a certain amount due to the fact how much rain you get, water going into the aquifer to pump back out, so a second pumping station

doesn't necessarily -- you know, it is going to do the trick as far as my knowledge is.

If this was 25 or 30 years ago, it would have been a fence around High Falls, because from my understanding this was worse than Love Canal, okay, this contamination, yes.

MR. BADALAMENTI: Well, the levels were pretty high back then, and they are a lot better today.

MR. KOEHLER: The levels were extremely high. Just as bad as Love Canal and Love Canal was fenced off many years ago.

Roy, this is personal right here. I can address your septic and well system explicitly after the meeting. I can explain that, talk to you all about it.

Other than that, as I was saying, I'd just like somebody from

Conti to get in touch with me.

MR. BADALAMENTI: Well, we'll have the Corps of Engineers representative look at the records and see what was supposed to have been done and whether it was done.

MR. KOEHLER: Thank you.

MR. BADALAMENTI: Are there any other concerns?

MR. KLUESNER: We want to thank you for coming out. And as I said on the fact sheet, the comment period runs through August 6. And you have the contact information up there in terms of any further comments.

We heard a lot of good things tonight. I think this has really served the purpose of having a public forum like this, hearing some suggestions, hearing some very good questions and having us go back and take a look at some of the matters and

really try to address those concerns to the best of our ability.

So thank you all for coming out and thank you.

(Whereupon, the meeting concluded at 9:05 p.m.)

o0o

C E R T I F I C A T I O N

I, Karen Schmieder, a Certified Shorthand Reporter, Certificate No. 768, and Notary Public, do hereby certify that I recorded stenographically the proceedings herein at the time and place noted in the heading hereof, and that the foregoing transcript is true and accurate to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF, I have hereunto set my hand this 21st day of July 2008.

KAREN SCHMIEDER, CSR, RMR
Registered Diplomate Reporter